Thermophysical Properties of High Temperature Solid Materials

VOLUME 5: NONOXIDES AND THEIR SOLUTIONS AND MIXTURES, INCLUDING MISCELLANEOUS CERAMIC MATERIALS

Thermophysical Properties
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Thermophysical Properties of High Temperature Solid Materials

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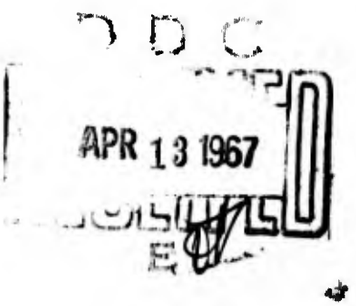

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PREFACE

The phenomenal growth of science and technology since the early forties has brought about a universal appreciation of the fact that present limitations in many technical developments are often a direct result of the paucity of knowledge on the properties of materials. Engineering developments in the years ahead will be closely linked to the research that is done today to contribute to a better understanding of the properties of matter, of which thermophysical properties constitute a major segment.

With a realization of the seriousness of this situation, a great deal of research effort has been made in recent years on the thermophysical properties of materials with the result that the volume of research literature has increased many fold. In spite of this fact, it is generally agreed that the present level of research on thermophysical properties still falls substantially short of existing needs and anticipated future demands. However, what is even more disturbing is the fact that engineering groups across the nation are using no more than a fraction of the information already available, either because it is in a form not directly useful to them or, often, because its existence is not generally known.

To partially remedy this situation concerning the thermophysical properties of high temperature materials, the Materials Laboratory of the U.S. Air Force at Wright-Patterson Air Force Base sponsored a project in 1957 to bring together a large portion of the then available data in a single work for easy reference. From this compilation, performed by the Armour Research Foundation, a four-volume work entitled *Handbook of Thermophysical Properties of Solid Materials* emerged. It was first published in 1960 as WADC TR58-476; in 1961 it was issued as a hard-bound set by The Macmillan Company.

Because of the favorable reception given to this original work, the Materials Laboratory of the U.S. Air Force requested the Thermophysical Properties Research Center (TPRC), in 1964, to update and revise this reference work in order to increase its usefulness and to put it on a more current basis. The present six-volume work, entitled *Thermophysical Properties of High Temperature Solid Materials*, consists of nine books totaling more than 8,500 pages. It is the result of a two-year project by TPRC. This new encyclopedic reference work cannot be called a revised edition of the earlier publication since nearly every page has been changed through major additions, corrections, and re-evaluation. An effort was made to adhere to the basic format of the earlier work. However, the organization of the material and the index to materials have been completely redesigned for greater ease in locating the information desired.

Inevitably, not all of the properties covered have received the same degree of attention. The material on thermal radiative properties, thermal diffusivity, and specific heat has been totally revised and rewritten. Materials on the coefficient of thermal expansion and thermal conductivity have received major revisions, and those on electrical resistivity, density, and melting point have had moderate revisions. Finally, lesser revisions were made to data concerning vapor pressure and heats of transformation. The new information incorporated into the work covered research conducted primarily during the years 1957 to 1964, although some major references are included from 1965 and some from as far back as 1910.

In processing the large amount of new and old data incorporated in these volumes, it was necessary that some degree of selectivity be exercised both from the standpoint of the references cited and the data extracted from them. It is hoped, however, that no major source of information has been omitted. Whenever possible, an effort was made to suggest recommended values of the properties. In the plots, recommended values are indicated by curves. It should be clear, however, that the designation of "recommended values" in no way implies that a critical analysis has been performed in all cases, nor does it suggest that they repre-

sent definitive values. Because most of the materials covered are not well-defined engineering materials, and because there is often a great paucity of information, any critical evaluation of these data is most difficult—if not impossible.

With a full appreciation of these inherent difficulties it is nevertheless hoped that the present compendia will prove to be of great usefulness to engineers seeking information on thermophysical properties. In spite of the extreme care exercised in processing the data and proofing the manuscript, it is possible that some errors might have been inadvertently overlooked. Should any instance of such oversight be uncovered, the Editor would be most indebted if it is brought to his attention.

The fact that such an enormous undertaking could be accomplished in such a short time is attributable primarily to TPRC's unique resources in the area of thermophysical properties information. Grateful acknowledgment is made to the Electronic Properties Information Center for assistance in providing bibliographic searches on electrical resistivity and to the Air Force Materials Laboratory for general assistance in bibliographic information. Extensive personal inquiries were made to the authors of research papers and reports requesting clarification and original data. The enthusiastic response to these inquiries (in the majority of the cases) is also gratefully acknowledged. The Editor and the contributing staff wish to give a special note of thanks in acknowledging the valuable assistance and cooperation they received individually and collectively from TPRC's Scientific Documentation Division personnel and the supporting staff of graphics and technical typists without whose painstaking and skillful contributions this work would not have been possible.

This work was performed under Contract No. AF33(615)1642, sponsored by the Air Force Materials Laboratory, Research and Technology Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. The personnel directly affiliated with this program were Mr. D. A. Shinn, Chief, Materials Information Branch; Mr. E. Dugger, Technical Manager, Information Processing; and Mr. J. H. Charlesworth, engineer in charge of this project. Their understanding cooperation has contributed much to the success of the program.

It is sincerely hoped that *Thermophysical Properties of High Temperature Solid Materials* will constitute an even more valuable contribution to technology than its predecessor. This work should prove to be an invaluable source of information on an important group of properties of materials to every engineer, providing him with reliable information of a scope that would be impossible for any one individual to master. If we have been able to approach these goals, the results will be highly gratifying.

June 1966

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EXPLANATORY TEXT

I. SCOPE OF COVERAGE

Thermophysical Properties of High Temperature Solid Materials comprises six volumes. Volumes 2, 4, and 6 each consist of two parts because of the large amount of material covered. The general contents of the respective volumes are as follows:

Volume 1—Elements
Volume 2—Nonferrous Alloys
  PART I—Nonferrous Binary Alloys
  PART II—Nonferrous Multiple Alloys
Volume 3—Ferrous Alloys
Volume 4—Oxides and Their Solutions and Mixtures
  PART I—Simple Oxygen Compounds and Their Mixtures
  PART II—Solutions and Their Mixtures of Simple Oxygen Compounds, Including Glasses and Ceramic Materials
Volume 5—Nonoxides and Their Solutions and Mixtures, Including Miscellaneous Ceramic Materials
Volume 6—Intermetallics, Cermets, Polymers, and Composite Systems
  PART I—Intermetallics
  PART II—Cermets, Polymers, and Composite Systems

The specific properties covered in each volume are:

1. Density (ρ)
2. Melting Point (M. P.)
3. Heat of Fusion (Δh_f)
4. Heat of Vaporization (Δh_v)
5. Heat of Sublimation (Δh_s)
6. Electrical Resistivity (r)
7. Specific Heat at Constant Pressure (c_p)
8. Thermal Conductivity (k)
9. Thermal Diffusivity (α)
10. Thermal Linear Expansion ($\Delta L/L$)
11. Thermal Radiative Properties:
    Absorptance (α), Emittance (ϵ), Reflectance (ρ), and Transmittance (τ)
12. Vapor Pressure (p)

Generally, only materials with melting points above 800°K (approximately 1000°F) are included, except for materials within the categories of polymers, plastics, and composites. A detailed discussion of the material classification procedure is presented in the following sections. A Material Index for the entire work is included at the end of each volume.

II. TPRC CLASSIFICATION OF MATERIALS

Materials are classified into the eight categories listed below. Whenever applicable, the compositions are reported in weight percent of the constitutents. For purposes of material classification TPRC considers the following elements as nonmetallic: H, He, C, N, O, F, Ne, P, S, Cl, A, Br, Kr, I, Xe, At, and Rn.

1. *Elements*: For the purpose of classification an element is specified as follows:
   A. For metallic elements, the limit of impurities is <0.20 percent for each foreign constituent and <0.50 percent total impurities.
   B. For nonmetallic elements (i.e., carbon including graphite and diamond), the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. *Nonferrous Alloys*: This category is for alloys in which the major constituent is other than iron. For the purpose of classification, nonferrous alloys are specified as follows:
   A. Nonferrous Binary Alloys: The sum of the binary constituents is ≥ 99.50 percent and other constituents ≤ 0.20 percent each.
   B. Nonferrous Multiple Alloys: The sum of the first two constituents is <99.50 percent and/or any other constituent >0.20 percent. Alternatively, the major constituent is ≤ 99.50 percent and each of the other constituents <0.20 percent (or not given).
3. *Ferrous Alloys*: This category is for alloys in which iron is greater than or equal to any other constituent. For the purpose of classification, ferrous alloys are specified as follows:
   A. Carbon Steels: Carbon ≤ 2.0 percent and carbon $\geq$ any other alloying constituent.
      a. Group I: Every other alloying constituent is ≤ 0.20 percent except for Mn, P, S, Si, which may be ≤ 0.60 percent each.
      b. Group II: At least one other alloying constituent >0.20 percent and/or any of Mn, P, S, Si >0.60 percent.
   B. Cast Irons: Carbon >2.0 percent and carbon $\geq$ any other alloying constituent.
      a. Group I: Every other alloying constituent ≤ 0.20 percent except for Mn, P, S, Si, which may be ≤ 0.60 percent each.
      b. Group II: At least one other alloying constituent >0.20 percent and/or any of Mn, P, S, Si >0.60 percent.
   C. Alloy Steels (including alloy cast iron): The major alloying constituent is other than carbon.
      a. Group I: Every other alloying constituent ≤ 0.20 percent except for Mn, P, S, Si, which may be ≤ 0.60 percent each, and C ≤ 2.0 percent.*
      b. Group II: At least one other alloying constituent >0.20 percent and/or any of Mn, P, S, Si >0.60 percent.*
4. *Nonmetallic Compounds and Their Mixtures and Solutions*: Ceramic materials such as oxides, bromides, carbides, carbonates, nitrides, silicates, etc., are included in this category. For the purpose of classification, they are specified as follows:
   A. For simple compounds and their solutions, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.

---

* Exception is made when Mn, P, S, or Si is the major alloying constituent. For instance, in the case of Fe + Mn + ΣX_i alloys the specifications corresponding to Groups I and II would be as follows:
  a. Group I: Every other alloying constituent ≤ 0.20 percent except for P, S, Si, which may be ≤ 0.60 percent each, and C ≤ 2.0 percent.
  b. Group II: At least one other alloying constituent >0.20 percent and/ any of P, S, Si >0.60 percent.
In the above example, Mn has a higher weight percentage than any of P, S, or Si but does not necessarily have a weight percentage higher than 0.60 percent. Thus, the limits of Mn percentage may be written:

$$\text{Fe} \geq \text{Mn} > \text{P, S, Si and any other alloying constituent and Mn} \geq 0.20.$$

The same guideline is applied to ferrous alloys containing P, S, or Si as major alloying constituents.

B. For mixtures of simple compounds and their solutions, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

5. *Intermetallics*: An intermetallic is a metal-metal compound formed by metallic elements in a fixed simple atomic ratio. For the purpose of classification, specifications are the same as those for Class 4.
6. *Cermets*: Cermets are ceramic materials such as carbides, oxides, etc., fused with or bonded by one or more pure metals. However, there are also metal-metal cermets, metal-intermetallic cermets, etc., which are also included in this category.
7. *Polymers*: Polymers are chemical compounds or mixtures of compounds formed by polymerization and consisting essentially of repeating molecular structural units.
8. *Composite Systems*: A composite system may consist of materials in combination, with clearly defined boundaries existing between components of the system, or a homogeneous material having a distinct configuration.

For the reader's convenience, the classification scheme for Classes 1 through 4, described above, is summarized in the following table.

SUMMARY TABLE OF TPRC CLASSIFICATION OF MATERIALS

Classification			Limits of Composition (weight percent)			
			X_1	$X_1 + X_2$	X_2	X_3
1. ELEMENTS	A. METALLIC		>99.50	--	<0.20	<0.20
	B. NONMETALLIC		≥95.0	--	≤2.0	≤2.0
2. NONFERROUS ALLOYS (X_1 > Fe)	A. BINARY ALLOYS		--	≥99.50	≥0.20	≤0.20
	B. MULTIPLE ALLOYS		--	≥99.50	>0.20	>0.20
			--	<99.50	≥0.20	≤0.20
			--	<99.50	>0.20	>0.20
			≤99.50	--	<0.20	<0.20
			X_1	X_2	X_3	Mn, P or Si
3. FERROUS ALLOYS (X_1 = Fe ≥ X_2)	A. CARBON STEELS	GROUP I	Fe	C ≤2.0	≤0.20	≤0.60
		GROUP II	Fe	C ≤2.0	≤0.20	>0.60
			Fe	C ≤2.0	>0.20	≤0.60
			Fe	C ≤2.0	>0.20	>0.60
	B. CAST IRONS	GROUP I	Fe	C >2.0	≤0.20	≤0.60
		GROUP II	Fe	C >2.0	≤0.20	>0.60
			Fe	C >2.0	>0.20	≤0.60
			Fe	C >2.0	>0.20	>0.60
	C. ALLOYS* STEELS	GROUP I	Fe	≠C	≤0.20 and C ≤2.0	≤0.60
		GROUP II	Fe	≠C	≤0.20	>0.60
			Fe	≠C	>0.20	≤0.60
			Fe	≠C	>0.20	>0.60

4. NONMETALLIC COMPOUNDS AND THEIR MIXTURES AND SOLUTIONS

	X_1	X_2
A. SIMPLE COMPOUNDS AND THEIR SOLUTIONS	≥95.0	≤2.0
B. MIXTURES OF SIMPLE COMPOUNDS AND THEIR SOLUTIONS	<95.0	≤2.0
	≥95.0	>2.0
	<95.0	>2.0

NOMENCLATURE:

X_1 = Major Constituent

X_2 = Second Highest Constituent

X_3 = Third Highest Constituent

Where: $X_1 \geq X_2 \geq X_3 \geq X_4 \geq \cdots\cdots$

*In case Mn, P, S, or Si represents X_2 this particular element is dropped from the last column.

III. PRESENTATION OF DATA

Each of the six volumes consists of seven sections arranged in the following order:

1. Preface
2. Table of Contents
3. Explanatory Text
4. Conversion Factors
5. Body of Data
6. References
7. Material Index.

In the following paragraphs a detailed description of Sections 5, 6, and 7 is given. The contents of the first four sections are self-explanatory.

BODY OF DATA

Data on each material are presented in graphical or tabular form for selected sets of measurements, and are accompanied by a Reference Information Table with corresponding specifications and remarks. The first five properties listed in Section I of this Explanatory Text are considered as *point values* and are grouped together in a single table in the same manner as the graphs for the other remaining properties. Furthermore, for a given material group, where several properties are reported, data are arranged in accordance with the order of the property list given in Section I of this text.

Graphic Presentation

Data extracted from various references on a given material and property are shown on a single graph by means of distinct plotting symbols, which are identified in the Reference Information Table on the page following the graph. Each set of symbols indicates the data of a given investigator, but does not necessarily imply actual measured points. In numerous instances authors present only smoothed values, either in graphical or tabular form, and it is frequently impossible to distinguish interpolated or smoothed values from actual observed data.

In reporting data on thermal linear expansion, investigators sometimes give a single average value of this property for a considerable temperature range. In such instances it is assumed that a linear relationship is implied. All data on thermal linear expansion were reduced to a datum of 293°K (20°C); i.e., $(\Delta L/L) = 0$ at 293°K (20°C). This point is identified by a cross (+) on each graph.

The definition of $(\Delta L/L)$ used in this work is

$$(\Delta L/L) = \frac{L_T - L_{293}}{L_{293}} \times 100$$

where L_T = length of specimen at temperature T.

L_{293} = length of specimen at 293°K (20°C).

To compute the "coefficient" of thermal linear expansion β from 293°K to any temperature T, the following relation may be used.*

$$\beta = \frac{1}{100\,(T - 293)} \frac{\Delta L}{L}, \text{ in } K^{-1}$$

* It is necessary to divide the right-hand side of this equation by 100 because the graphical presentation of $(\Delta L/L)$ is in percent expansion from 293°K.

In some instances the coefficient of thermal linear expansion is reported in tabular form.

Curves drawn through the plotted points are the "most probable" curves based on the data shown. As additional information becomes available in the future, these recommendations may well be modified.

Point Value Table

Data extracted from various references are identified by distinct symbols in the same manner as data points on a graph. "Most probable" values are given either at the top of the table or are indicated in a footnote. These selections are usually made solely on the basis of the data presented. Sometimes these point values are also reported as a function of temperature or composition, in which case they are shown in graphical form and placed immediately following the tabular values.

Reference Information Table

A table giving the reference information associated with each set of data obtained in the graph immediately follows the graph. The table contains the following information:

1. Symbol. The plotting symbols are identical with and correspond to those used in the graph.
2. Reference. References are identified by hyphenated numbers which serve to locate the bibliographic citation in the section of References at the end of each volume. The initial two digits indicate the year of publication and the last digits identify the specific reference within the given year. In those instances where a reference does not carry a date, the letter symbol ND is used in place of the year of publication. Undated references are listed at the end of the list of References.
3. Temperature Range. Range covered by the data in a given paper or report.
4. Reported Error. The author's estimated accuracy (or precision).
5. Sample Specification. This column contains all pertinent available information about the test sample. This information consists of the following:
   a. Commercial trade name, chemical formula, etc., followed by manufacturer's name, if it is necessary for correct identification.
   b. Composition of the sample, expressed in weight percent. Unless otherwise stated, the percent sign is omitted.
   c. Physical characteristics of the material, such as a single crystal, polycrystalline, density, crystal structures, etc.
   d. Specimen designation by the author is given in brackets at the end of the citation.
6. Remarks. This column contains information on:
   a. Special process used in fabrication of the sample, such as being sintered, chill-cast, etc.
   b. Sample history, such as cold-worked, hot-pressed, annealed, etc.
   c. Conditions under which the specimen was investigated, environment, etc.
   d. Other pertinent remarks.

REFERENCES

The section on Reference gives complete bibliographic citations for all the references from which data were extracted. They are arranged chronologically by year of publication, and in arbitary sequence within any given year.

For the preparation of the references, the following order and convention is used.

Periodicals

1. Author(s) name: Last name first, followed by initials.
2. Journal name: Standard TPRC journal name abbreviations are used.
3. Series, volume, and number.

a. If the series is represented by a letter, it is underlined together with the volume number.
b. If the series is represented by a number, then only the numeral representing the volume is underlined.
c. The numeral for the issue number is shown in parentheses.

4. Pages: Indicate the beginning and ending pages.

Reports

1. Author(s) name is given in the same form as for periodicals.
2. The name of the responsible organization, if any.
3. The name of sponsor.
4. Report, bulletin, or circular designation.
5. Number.
6. Part.
7. Pages (same as for periodicals).
8. AD and PB numbers or equivalents.

Books

The bibliographic citation for books lists: author(s), title, volume, edition, publisher, and page(s).

In general, private communications are not listed as references. However, if TPRC did obtain additional substantive information from an author through private communication, and if this information was used, the remark "additional data obtained from author(s)" is added at the end of the reference citation.

MATERIAL INDEX

The Material Index lists all the materials included in this work by their proper trade or commercial names arranged in alphabetical order and, for materials designated by number codes, the listing is in increasing numerical order. Location of information on a particular property for a particular material is specified by the volume number and page numbers indicated within the appropriate property column of the index. The page number always indicates the starting page of the graphs or point value tables. Chemical formulas are given in parentheses following the proper names of materials which can be chemically identified. However, for materials within a general group, e.g., different oxides of cerium, the entries are only by chemical formulas listed under the material group designation, such as "cerium oxides." Whenever applicable, an effort is made to list commercial materials under their several accepted names. In the case of broad classes of materials, such as steels, glasses, etc., the materials are listed under their common names as well as under the heading of their general class when the designation is merely a letter and number code.

Simpler inorganic compounds (e.g., aluminum oxide, tantalum boride) are named according to the convention given in the *Handbook of Chemistry and Physics* (The Chemical Rubber Co., 45th edition, 1964, and—if not available there—the 43rd edition, 1962). Other inorganic compounds are generally named in accordance with the convention given in the *Chemical Abstracts* by giving the more electropositive part of the name first and the more electronegative part second. For nonferrous and ferrous alloys, only the first two components are listed and ΣX_i is added to designate multiple alloys. An exception is made, however, for chromium-nickel and nickel-chromium ferrous alloys, in which cases, all three major constituents are listed. For other inorganic compounds and their mixtures and solutions, all components with weight percent greater than 2 percent are listed. Finally, for cermets, the name of the ceramic part is given first and the metal part second, each in their respective alphabetical order regardless of their weight percentages, with the exception of beryllium cermet (e.g., Beryllium YB-9052), in which case the name of the metal part is given first.

CONVERSION FACTORS

NOTE: In preparing the conversion factors, the following basic definitions were used:

1 in. = 2.54 cm*

1 lb. = 453.59237 g*

1 cal_{Th} = 4.184 (exactly) Joule*

1 cal_{IT} = 4.1868 (exactly) Joule*

1 $Btu_{IT}lb^{-1}F^{-1}$ = 1 $cal_{IT}g^{-1}C^{-1}$‡

The subscripts "Th" and "IT" denote "Thermochemical" and "International Steam Table" units, respectively.

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* *NBS Technical News Bulletin*, **47**(10), 1963.

‡ Mueller, E. F., and Rossini, F. D., *Am. J. Physics*, **12**(1), 4, 1944.

CONVERSION FACTORS FOR UNITS OF DENSITY

MULTIPLY by appropriate factor to OBTAIN →	$g\ cm^{-3}$	$g\ in.^{-3}$	$kg\ m^{-3}$	$kg\ ft^{-3}$	$lb\ in.^{-3}$	$lb\ ft^{-3}$
$g\ cm^{-3}$	1	1.63872×10	1.0×10^{3}	2.83170×10	3.61275×10^{-2}	6.24283×10
$g\ in.^{-3}$	6.10234×10^{-2}	1	6.10234×10	1.72800	2.20462×10^{-3}	3.80959
$kg\ m^{-3}$	1.0×10^{3}	1.63872×10^{-2}	1	2.83170×10^{-2}	3.61275×10^{-5}	6.24283×10^{-2}
$kg\ ft^{-3}$	3.51446×10^{-2}	5.78704×10^{-1}	3.53145×10	1	1.27582×10^{-3}	2.20462
$lb\ in.^{-3}$	2.76797×10	4.53592×10^{2}	2.76797×10^{4}	7.83808×10^{2}	1	1.72800×10^{3}
$lb\ ft^{-3}$	1.60184×10^{-2}	2.62496×10^{-1}	1.60184×10	4.53592×10^{-1}	5.78704×10^{-4}	1

CONVERSION FACTORS FOR UNITS OF LATENT HEAT

MULTIPLY by appropriate factor to OBTAIN →	$cal_{Th}g^{-1}$	$cal_{IT}g^{-1}$	W sec g^{-1}	$J_{Int}g^{-1}$	$Btu_{Th}lb^{-1}$	$Btu_{IT}lb^{-1}$
$cal_{Th}g^{-1}$	1	9.99331×10^{-1}	4.184	4.18331	1.8	1.79880
$cal_{IT}g^{-1}$	1.00067	1	4.1868	4.18611	1.80120	1.8
W sec g^{-1}	2.39006×10^{-1}	2.38846×10^{-1}	1	9.99835×10^{-1}	4.30210×10^{-1}	4.29923×10^{-1}
$J_{int}g^{-1}$	2.39045×10^{-1}	2.38885×10^{-1}	1.00017	1	4.30281×10^{-1}	4.29994×10^{-1}
$Btu_{Th}lb^{-1}$	5.55556×10^{-1}	5.55184×10^{-1}	2.32444	2.32406	1	9.99331×10^{-1}
$Btu_{IT}lb^{-1}$	5.55927×10^{-1}	5.55556×10^{-1}	2.326	2.32562	1.00067	1

CONVERSION FACTORS FOR UNITS OF SPECIFIC HEAT

MULTIPLY ↓ by appropriate factor to OBTAIN →	$cal_{Th}g^{-1}C^{-1}$	$cal_{IT}g^{-1}C^{-1}$	W sec $g^{-1}K^{-1}$	$J_{Int}g^{-1}K^{-1}$	$Btu_{Th}lb^{-1}F^{-1}$	$Btu_{IT}lb^{-1}F^{-1}$
$cal_{Th}g^{-1}C^{-1}$	1	9.99331×10^{-1}	4.184	4.18331	1	9.99331×10^{-1}
$cal_{IT}g^{-1}C^{-1}$	1.00067	1	4.1868	4.18611	1.00067	1
W sec $g^{-1}K^{-1}$	2.390006×10^{-1}	2.38846×10^{-1}	1	9.99835×10^{-1}	2.39006×10^{-1}	2.38846×10^{-1}
$J_{Int}g^{-1}K^{-1}$	2.39045×10^{-1}	2.38885×10^{-1}	1.00017	1	2.39045×10^{-1}	2.38885×10^{-1}
$Btu_{Th}lb^{-1}F^{-1}$	1	9.99331×10^{-1}	4.184	4.18331	1	9.99331×10^{-1}
$Btu_{IT}lb^{-1}F^{-1}$	1.00067	1	4.1868	4.18611	1.00067	1

Note: To convert quantities per "gram" to "mol" basis multiply conversion factor by the molecular weight M.

CONVERSION FACTORS FOR UNITS OF THERMAL CONDUCTIVITY

MULTIPLY by appropriate factor to OBTAIN →	$Btu_{IT} hr^{-1} ft^{-1} F^{-1}$	$Btu_{IT} in. hr^{-1} ft^{-2} F^{-1}$	$cal_{IT} sec^{-1} cm^{-1} C^{-1}$	$cal_{Th} sec^{-1} cm^{-1} C^{-1}$	$kcal_{Th} hr^{-1} m^{-1} C^{-1}$	$W\ cm^{-1} K^{-1}$
$Btu_{IT} hr^{-1} ft^{-1} F^{-1}$	1	1.2×10	4.13379×10^{-3}	4.13656×10^{-3}	1.48916	1.73073×10^{-2}
$Btu_{IT} in. hr^{-1} ft^{-2} F^{-1}$	8.33333×10^{-2}	1	3.44482×10^{-4}	3.44713×10^{-4}	1.24097×10^{-1}	1.44228×10^{-3}
$cal_{IT} sec^{-1} cm^{-1} C^{-1}$	2.41909×10^{2}	2.90291×10^{3}	1	1.00067	3.60241×10^{2}	4.1868
$cal_{Th} sec^{-1} cm^{-1} C^{-1}$	2.41747×10^{2}	2.90096×10^{3}	9.99331×10^{-1}	1	3.6×10^{2}	4.184
$kcal_{Th} hr^{-1} m^{-1} C^{-1}$	6.71520×10^{-1}	8.05824	2.77592×10^{-3}	2.77778×10^{-3}	1	1.16222×10^{-2}
$W\ cm^{-1} K^{-1}$	5.77789×10	6.93347×10^{2}	2.38846×10^{-1}	2.39006×10^{-1}	8.60421×10	1

CONVERSION FACTORS FOR UNITS OF THERMAL DIFFUSIVITY

MULTIPLY ↓ by appropriate factor to OBTAIN →	cm^2sec^{-1}	cm^2hr^{-1}	m^2hr^{-1}	$in.^2sec^{-1}$	ft^2sec^{-1}	ft^2hr^{-1}
cm^2sec^{-1}	1	3.60×10^{3}	3.60×10^{-1}	1.550×10^{-1}	1.07639×10^{-3}	3.87501
cm^2hr^{-1}	2.77778×10^{-4}	1	1.0×10^{-4}	4.30556×10^{-5}	2.98998×10^{-7}	1.07639×10^{-3}
m^2hr^{-1}	2.77778	1.0×10^{4}	1	4.30556	2.98998×10^{-3}	1.07639×10
$in.^2sec^{-1}$	6.45160	2.32258×10^{4}	2.32258	1	6.94444×10^{-3}	2.50×10
ft^2sec^{-1}	9.29030×10^{2}	3.34451×10^{6}	3.34451×10^{2}	1.440×10^{2}	1	3.60×10^{3}
ft^2hr^{-1}	2.58064×10^{-1}	9.29030×10^{2}	9.29030×10^{-2}	4.0×10^{-2}	2.77778×10^{-4}	1

CONVERSION FACTORS FOR UNITS OF VAPOR PRESSURE

MULTIPLY by appropriate factor to OBTAIN →	dyne cm^{-2}	atm	kg cm^{-2}	mm Hg	in. Hg	lb $in.^{-2}$
dyne cm^{-2}	1	9.8690×10^{-7}	1.01970×10^{-6}	7.5010×10^{-4}	2.9530×10^{-5}	1.45040×10^{-5}
atm	1.01330×10^{6}	1	1.03320	7.60×10^{2}	2.9920×10	1.46960×10
kg cm^{-2}	9.8070×10^{5}	9.6780×10^{-1}	1	7.3560×10^{2}	2.8960×10	1.42230×10
mm Hg	1.33320×10^{3}	1.31580×10^{-3}	1.35950×10^{-3}	1	3.9370×10^{-2}	1.93370×10^{-2}
in. Hg	3.3860×10^{4}	3.3420×10^{-2}	3.4530×10^{-2}	2.540×10	1	4.9120×10^{-1}
lb $in.^{-2}$	6.89470×10^{4}	6.80460×10^{-2}	7.0310×10^{-2}	5.1710×10	2.0360	1

BODY OF DATA

NONOXIDES AND THEIR SOLUTIONS AND MIXTURES, INCLUDING MISCELLANEOUS CERAMIC MATERIALS

BROMIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple bromine compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤2.0 percent for each foreign constituent and ≤5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

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PROPERTIES OF PLUTONIUM TRIBROMIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.69*	417*
Melting Point	954	1717
Heat of Fusion	27.8	50.1
Heat of Vaporization . . .	151_{0K}	271_{0R}
Heat of Sublimation	170_{0K}	307_{0R}

*Handbook of Chemistry and Physics (Ref. 64-18)

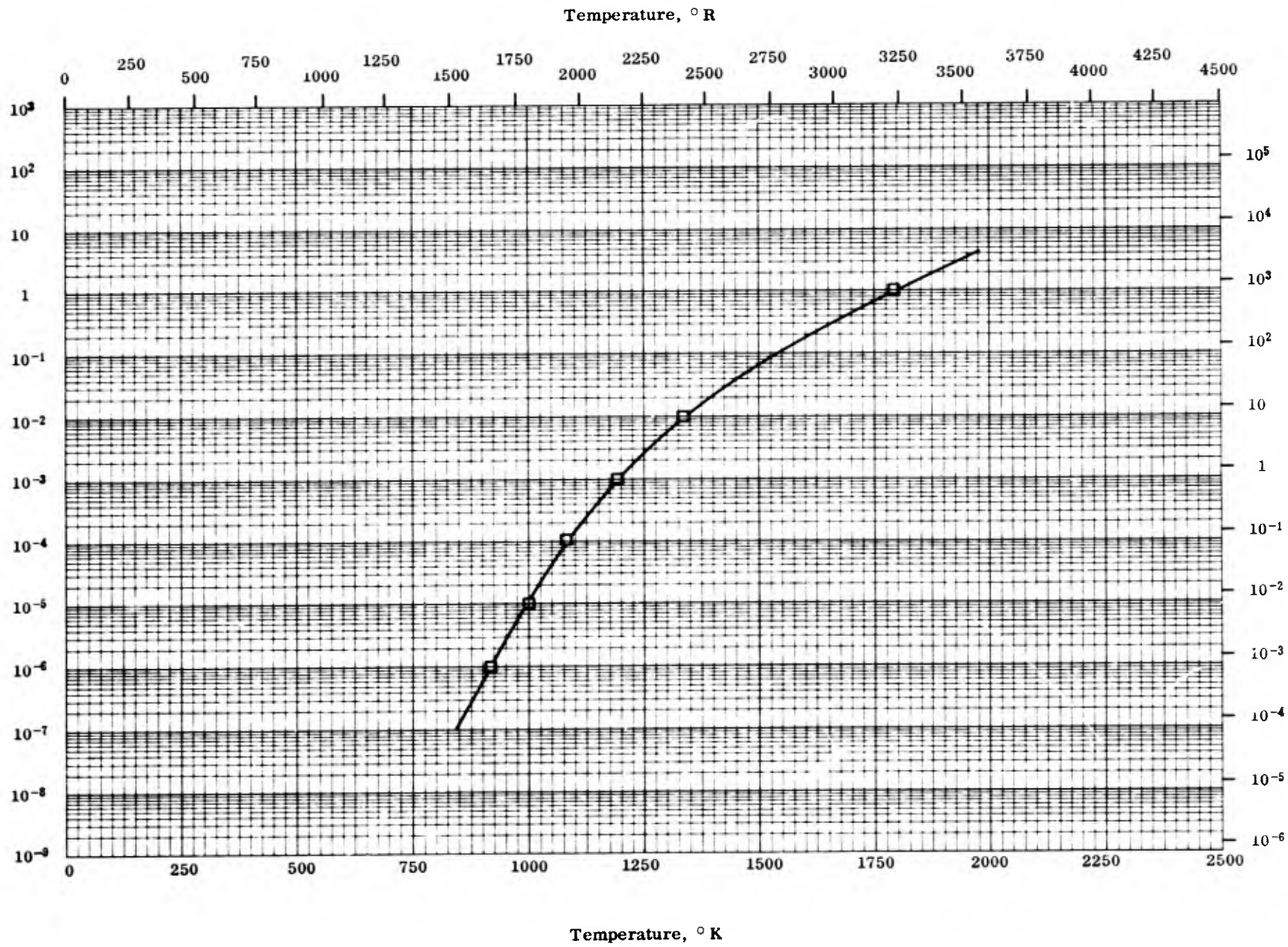
REPORTED VALUES

Melting Point		K	R
	○	954	1717
Heat of Fusion		**cal g^{-1}**	**Btu lb^{-1}**
	□	27.8_{954K}	50.1_{1717}
Heat of Vaporization		**cal g^{-1}**	**Btu lb^{-1}**
	△	151_{0K}	271_{0R}
	▽	91_{1785K}	160_{3213R}
Heat of Sublimation		**cal g^{-1}**	**Btu lb^{-1}**
	◇	170_{0K}	307_{0R}

PROPERTIES OF PLUTONIUM TRIBROMIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-1	954		$PuBr_3$.	
□	49-1	954		$PuBr_3$.	
△	49-1	0		$PuBr_3$.	
▽	49-1	1785		$PuBr_3$.	
◇	49-1	0		$PuBr_3$.	



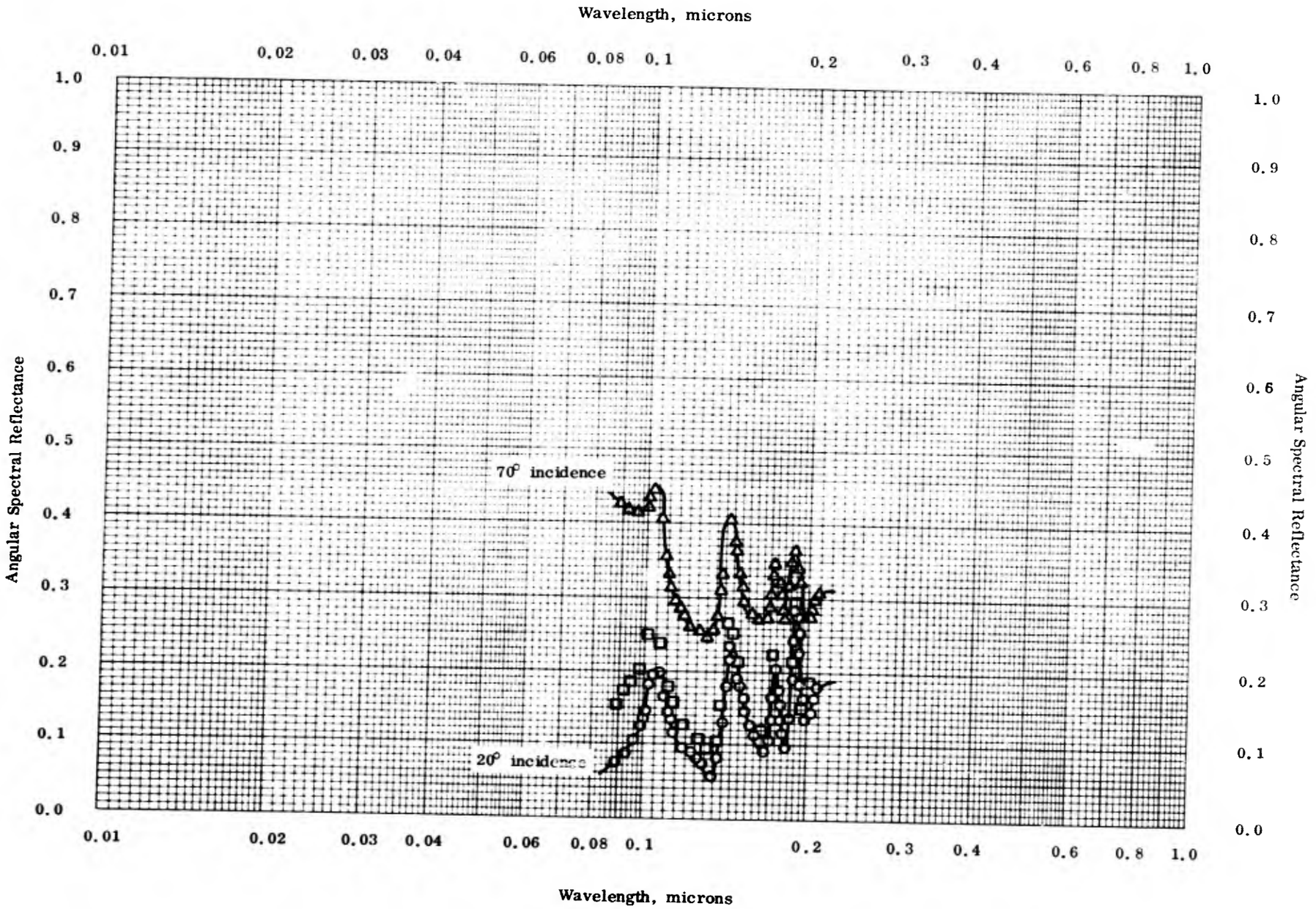
TRC

VAPOR PRESSURE -- PLUTONIUM TRIBROMIDE

VAPOR PRESSURE -- PLUTONIUM TRIBROMIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	49-1	923-1785		$PuBr_3$.	

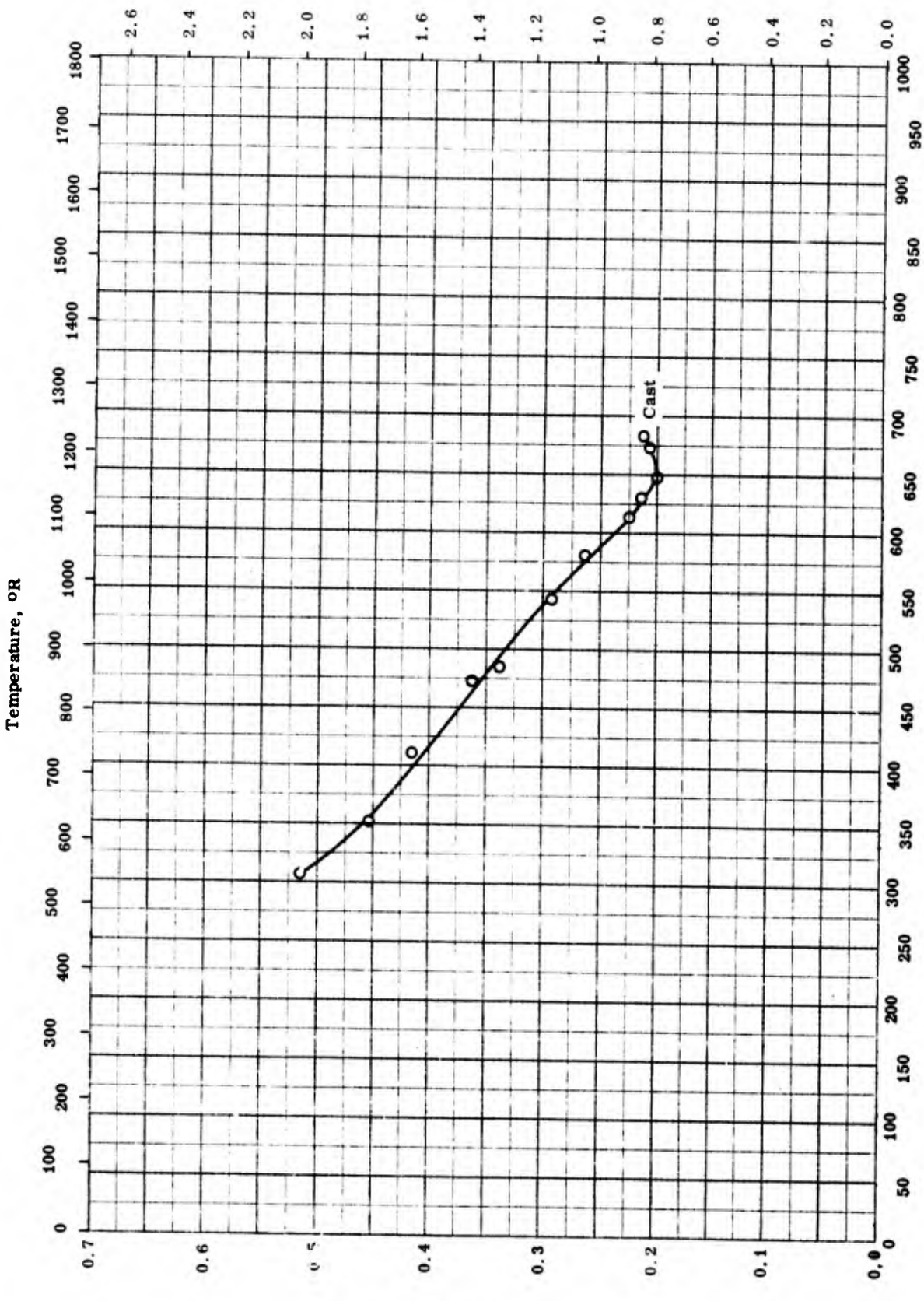


ANGULAR SPECTRAL REFLECTANCE — POTASSIUM BROMIDE

ANGULAR SPECTRAL REFLECTANCE -- POTASSIUM BROMIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	63-22	298	0.08-0.20		KBr.	Cleaved crystal in unpolarized light; 20 degree incidence, hemispherical viewing.
□	63-22	298	0.08-0.20		Same as above.	Same as above; 50 degree incidence, hemispherical viewing.
△	63-22	298	0.08-0.20		Same as above.	Same as above; 70 degree incidence, hemispherical viewing.



THERMAL DIFFUSIVITY -- SILVER BROMIDE

THERMAL DIFFUSIVITY -- SILVER BROMIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-1	306-683		Sample 3 mm dia rod.	Cast; measurements determined from the cooling characteristics of a fine platinum wire along the axis of the sample.

PROPERTIES OF MISCELLANEOUS BROMIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	$NpBr_3$	6.61	413
□	UBr_3	6.53	408
●	$CeBr_3$	5.18	323
■	$LaBr_3$	4.07	254
△	$PrBr_3$	5.26	328

PROPERTIES OF MISCELLANEOUS BROMIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-9	298		$NpBr_3$	Computed from x-ray measurements of lattice.
□	49-9	298		$U Br_3$	Same as above.
●	49-9	298		$CeBr_3$	Same as above.
■	49-9	298		$LaBr_3$	Same as above.
△	49-9	298		$PrBr_3$	Same as above.

CARBIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple carbon compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

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PROPERTIES OF BERYLLIUM CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	1.9	119
Melting Point	2373	4271
Heat of Fusion	559	1079
Heat of Vaporization. . . .	6524	11743

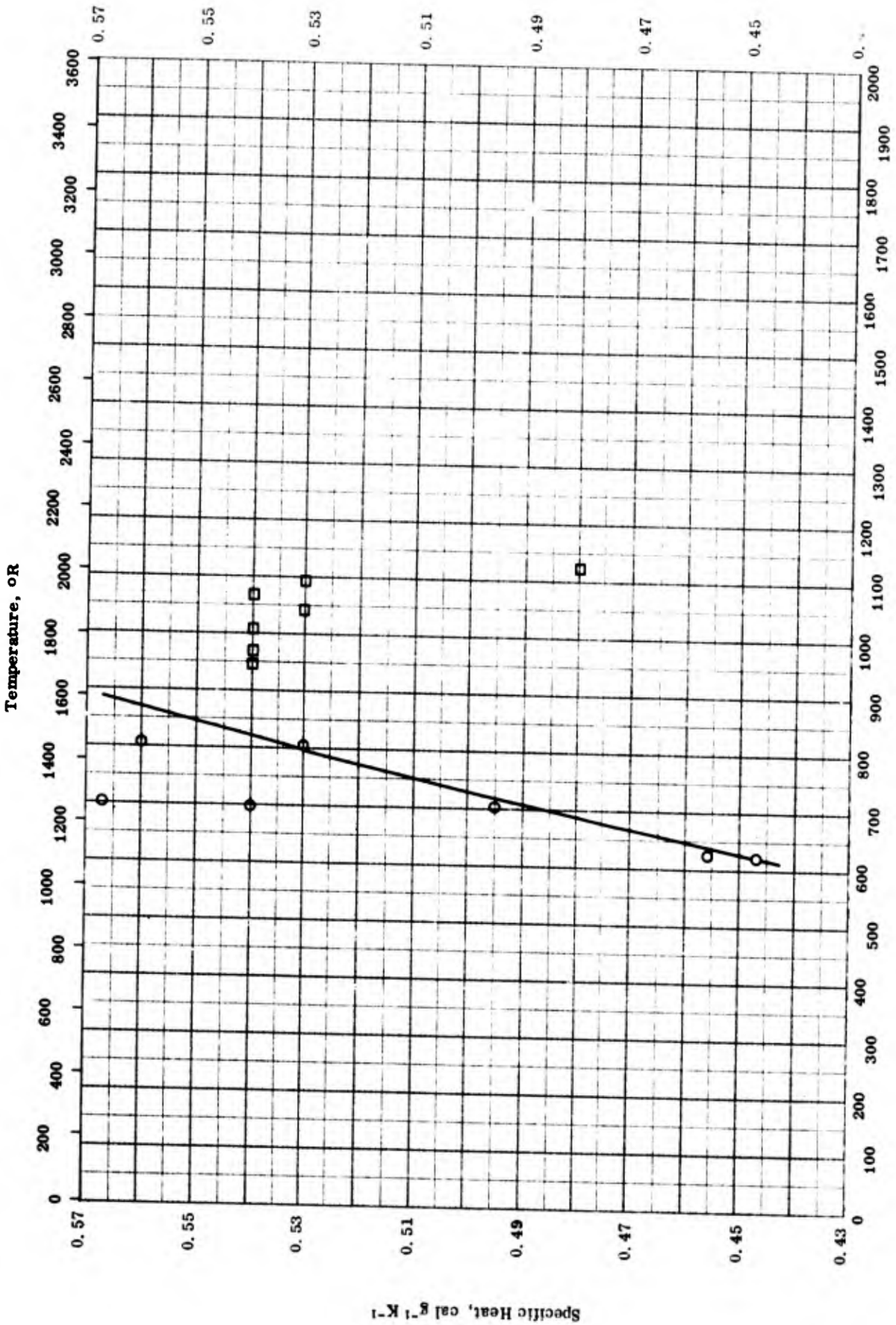
REPORTED VALUES

		$g\ cm^{-3}$	$lb\ ft^{-3}$
Density	△	1.9	119
		K	**R**
Melting Point	▽	2473	4451
	◇	2373	4271
		$cal\ g^{-1}$	$Btu\ lb^{-1}$
Heat of Fusion	○	599.3	1078.7
		$cal\ g^{-1}$	$Btu\ lb^{-1}$
Heat of Vaporization	□	6524	11743

PROPERTIES OF BERYLLIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	298		Be_2C.	
△	61-21	288		Be_2C.	
□	61-21	298		Be_2C.	
▽	56-8	2473		Be_2C.	Decomposition temperature.
◇	60-28	2373		Be_2C.	Decomposition temperature.

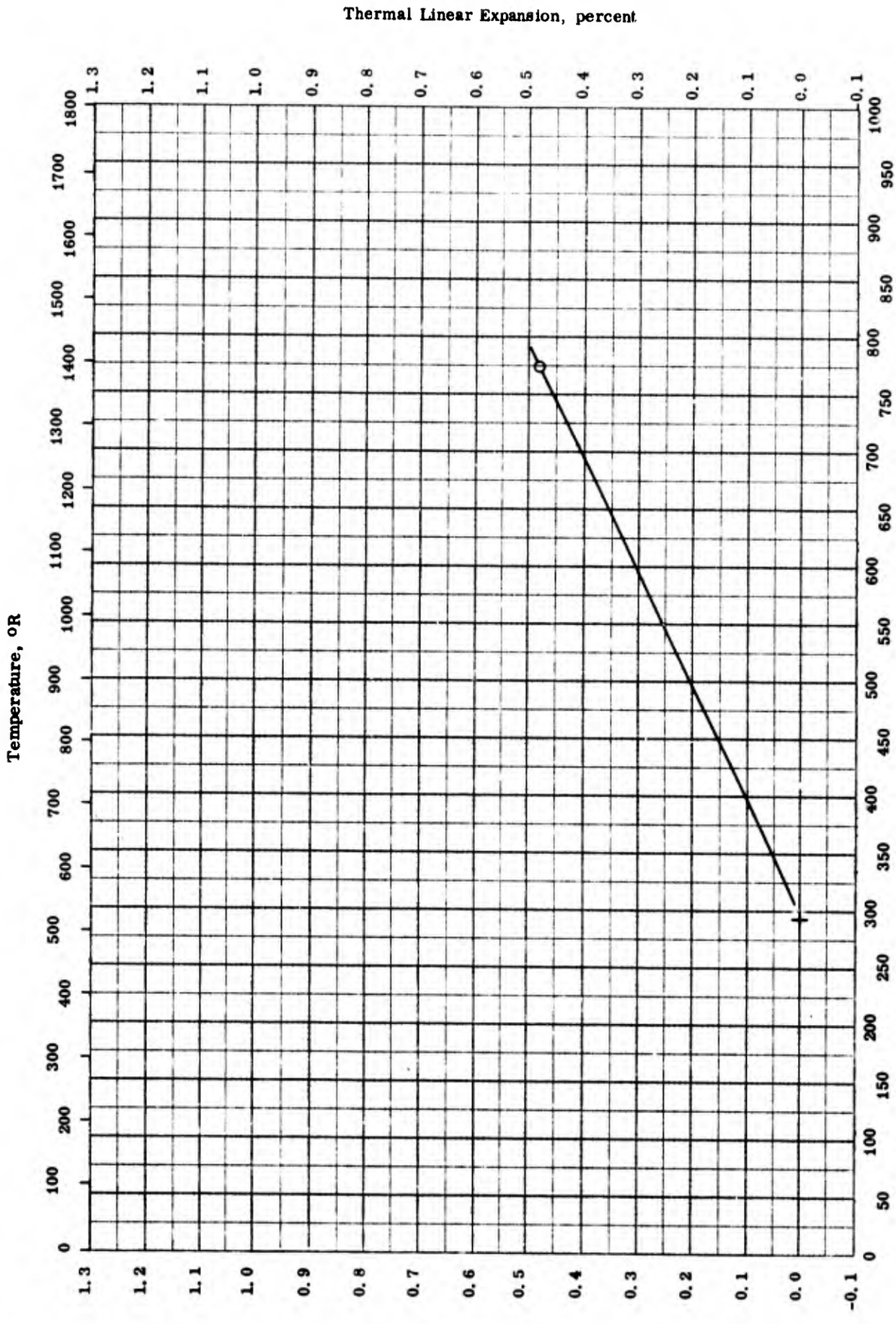


SPECIFIC HEAT -- BERYLLIUM CARBIDE

SPECIFIC HEAT -- BERYLLIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	48-3	625-804	± 15	Be_2C; 56.5 Be, 3.14 free C, and 0.005 free Fe.	Powdered sample.
□	48-2	946-1150	±25	Be_2C; left end: 52.45 Be, 1.94 free C; middle: 48.65 Be, 3.39 free C; right end: 50.24 Be, 1.96 free C (theoretical 60.05 Be.)	Hot pressed hollow cylinder.

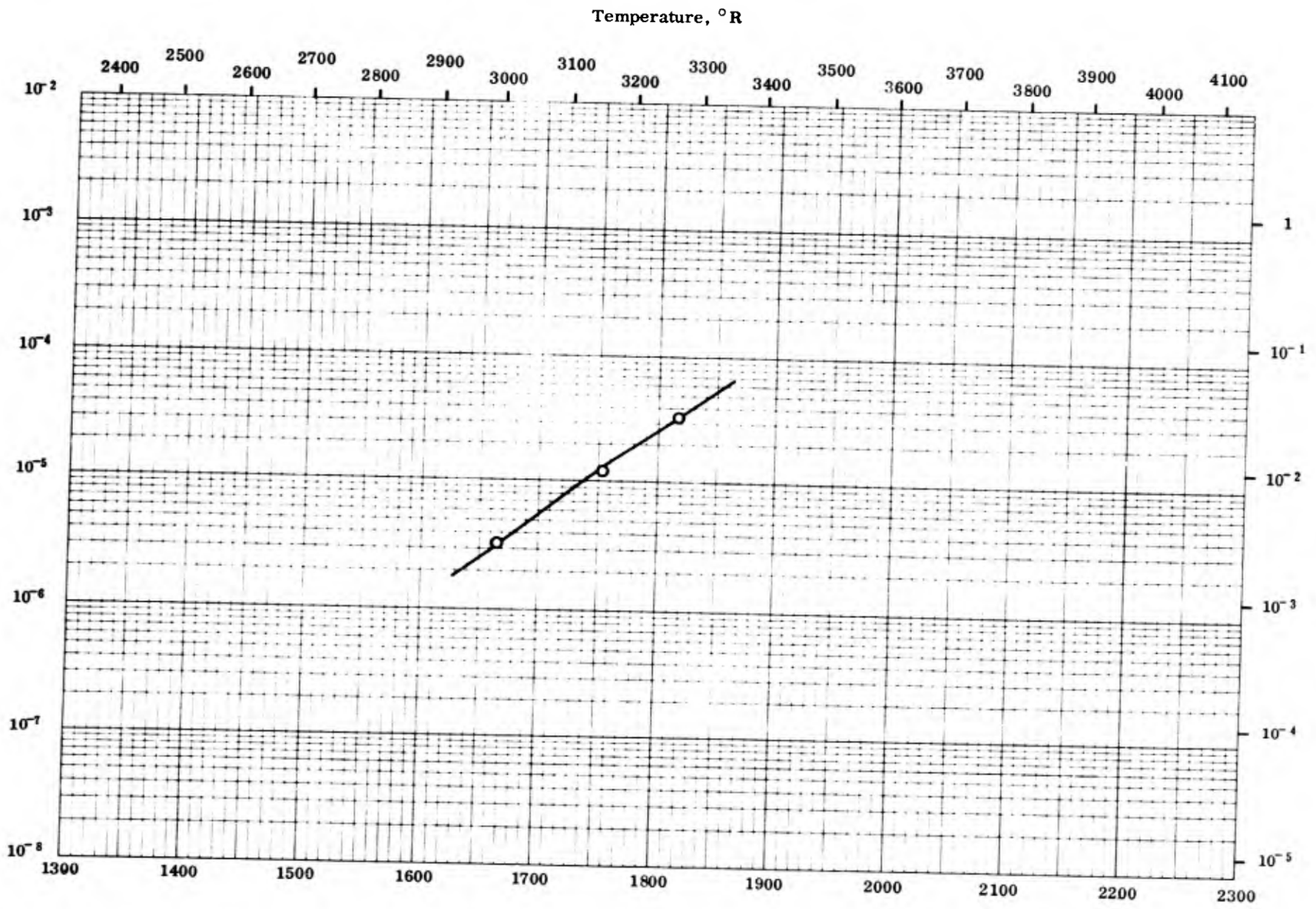


THERMAL LINEAR EXPANSION — BERYLLIUM CARBIDE

THERMAL LINEAR EXPANSION -- BERYLLIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-23	298-773		Be_2C.	



TPRC

VAPOR PRESSURE -- BERYLLIUM CARBIDE

VAPOR PRESSURE -- BERYLLIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-1	1667-1818		Be_2C.	Plotted Be(g) from the equation 1/2 Be_2C(s) → Be(g) + 1/2 C(g).

PROPERTIES OF BORON CARBIDES

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Melting Point	2723*	4901*

* For B_4C only.

REPORTED VALUES

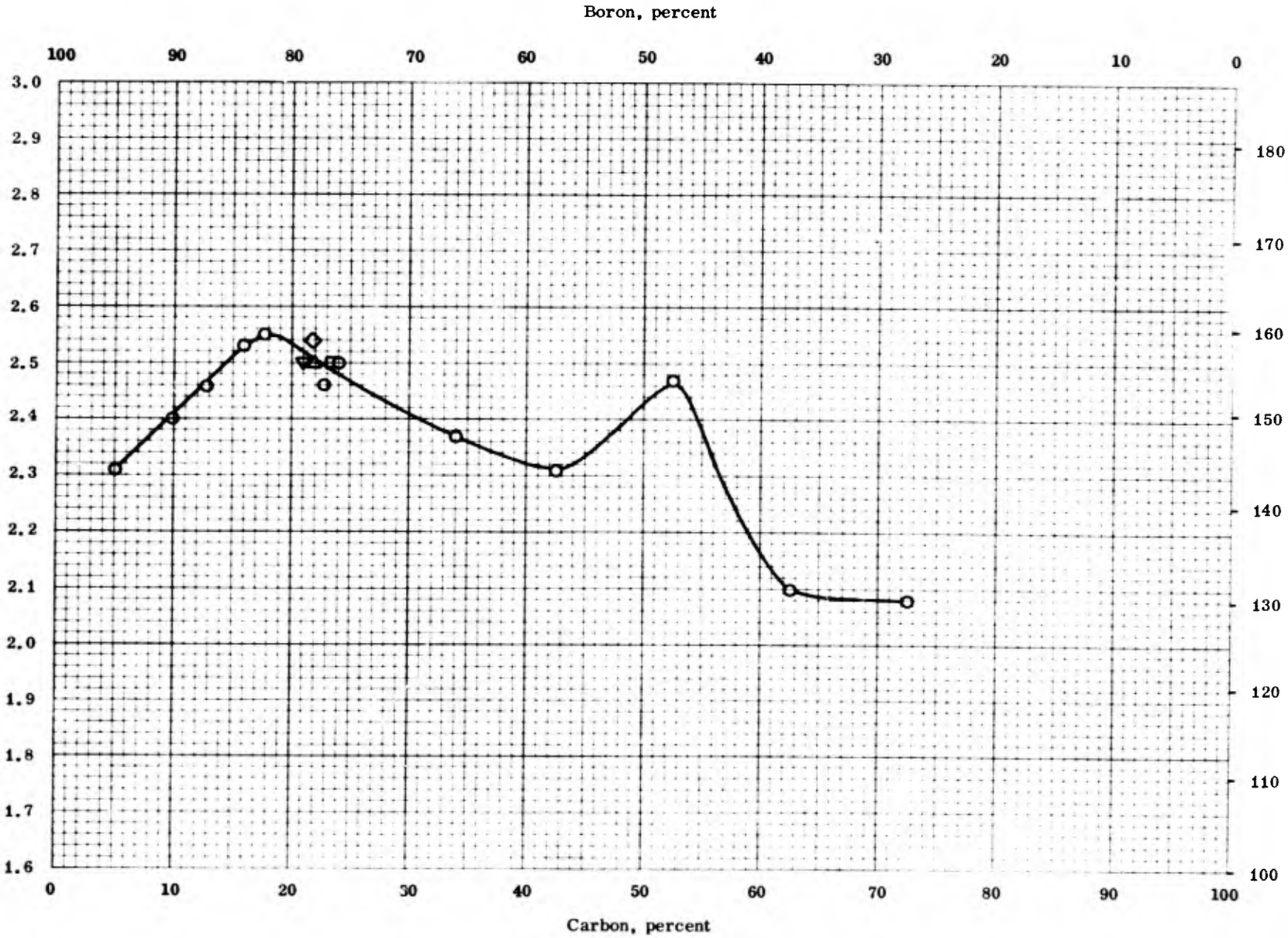
Density — See figure

Melting Point	K	R
○	2623	4721
□	2723	4901
△	2673 ± 50	4811 ± 90

PROPERTIES OF BORON CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-11	2623		B_4C.	
□	57-22	2723		B_4C.	
△	60-28	2623-2723		B_4C.	

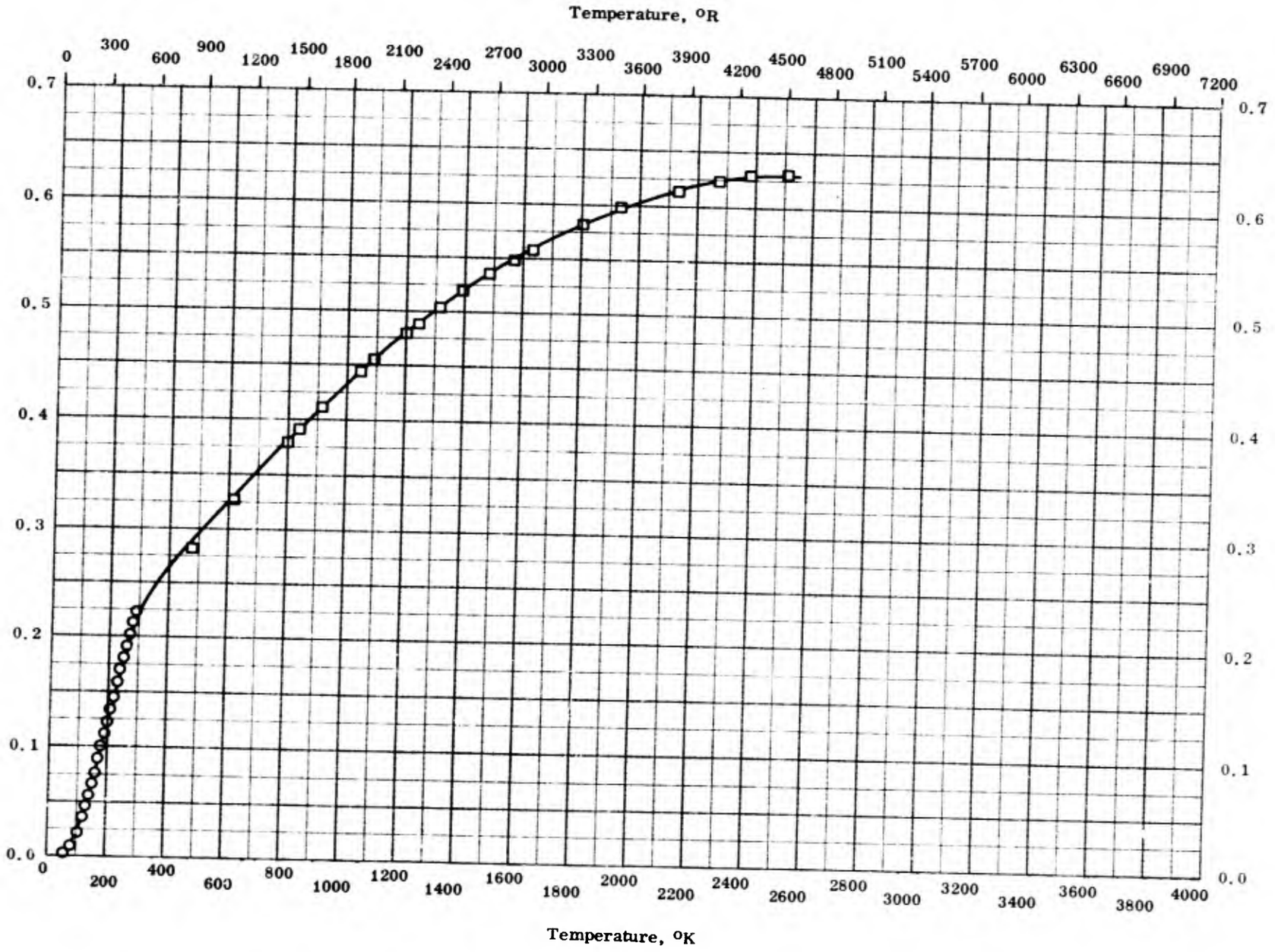


DENSITY -- BORON CARBIDES

DENSITY -- BORON CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-14	298		5.11-72.5 C; prepared from 99.5 B and 99.8 lampblack.	Hot-pressed; stress received, homogenized in vacuum furnace, and slowly cooled.
▽	50-8	298		79.08 B, 10.79 combined C, and 3.85 free C.	Hot-pressed; auth. gives theoretical density 2.52 g cm^{-3}.
□	52-6	298		76.6 B, 23.54 C, and 0.06 Fe.	
△	60-22	298		B_4C.	
◇	61-21	298		B_4C.	

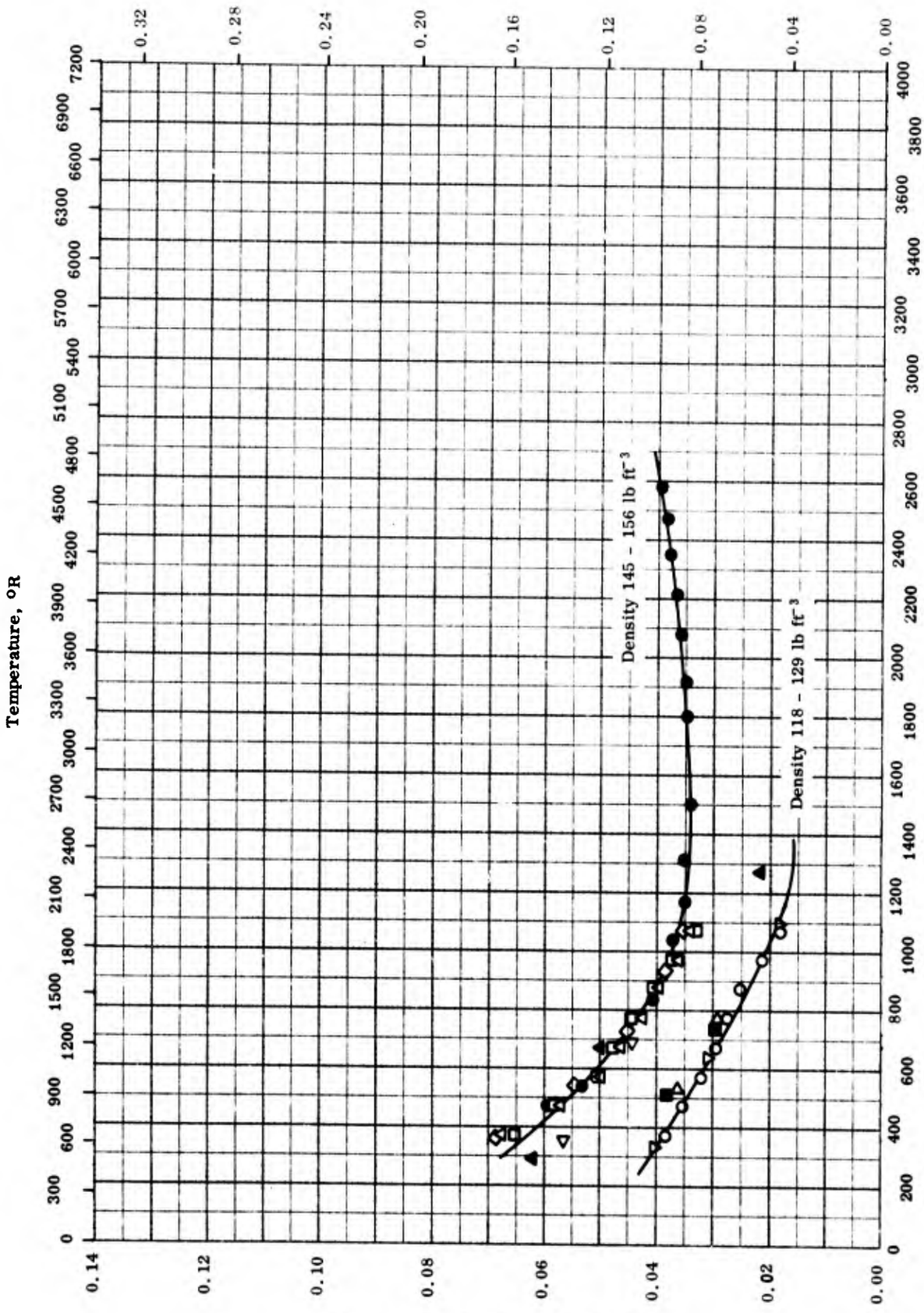


SPECIFIC HEAT -- BORON CARBIDE

SPECIFIC HEAT -- BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	41-2	54-294	0.5	96 B_4C, 4 free C and included graphite.	Corrected for graphite.
□	51-5	481-2510	± 5.0	75.97 B, 21.18 C, 0.40 Si, 0.27 Fe, 0.07 Be_2O_7, and 0.015 Al_2O_3; density 156 lb ft^{-3}.	Hot pressed at 3940 F.

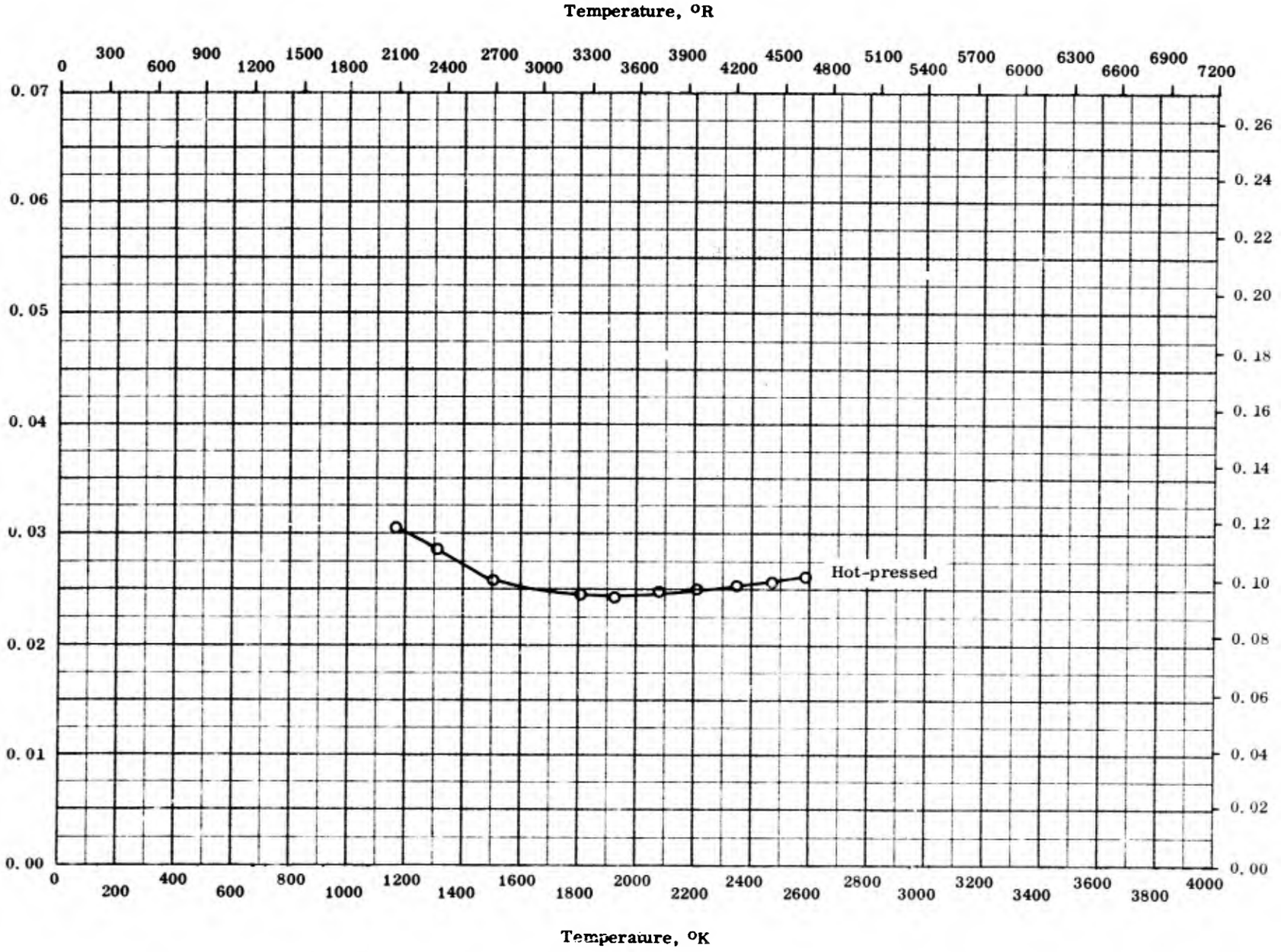


THERMAL CONDUCTIVITY -- BORON CARBIDE

THERMAL CONDUCTIVITY -- BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	51-4	373-1073		B_4C (No. D11, 798-1); density 119 lb ft^{-3}.	Tested in vacuum.
□	51-4	373-1073		B_4C (Norton No. D11, 776-2); density 145 lb ft^{-3}.	Same as above.
△	51-4	373-1073		$B_{3.85}C$; 77.1 B and 22.2 C; density 156 lb ft^{-3}.	Hot-pressed; tested in vacuum.
◇	57-7	363-1073		Two samples: (a) Density 156 lb ft^{-3}. (b) Density 145 lb ft^{-3}.	Plotted average of two samples agreeing within 1%.
▽	57-7	328-1098		Density 119 lb ft^{-3}.	Rammed and sintered.
◁	57-7	358-983		Density 118 lb ft^{-3}.	Same as above.
▷	57-7	533-763		B_4C with 1.85 sodium silicate binder; density 127 lb ft^{-3}.	Rammed with sodium silicate binder.
■	57-7	533-738		B_4C with 2.15 sodium silicate binder; density 129 lb ft^{-3}.	Same as above.
▲	58-1	293-1273		B_4C.	
●	63-1	469-2580	±4	75.97 B, 21.18 C, 0.40 Si, 0.27 Fe, 0.07 B_2O_7, and 0.015 Al_2O_3; density 156 lb ft^{-3}.	Hot-pressed and fired at 3940 F; both surfaces ground flat and parallel.

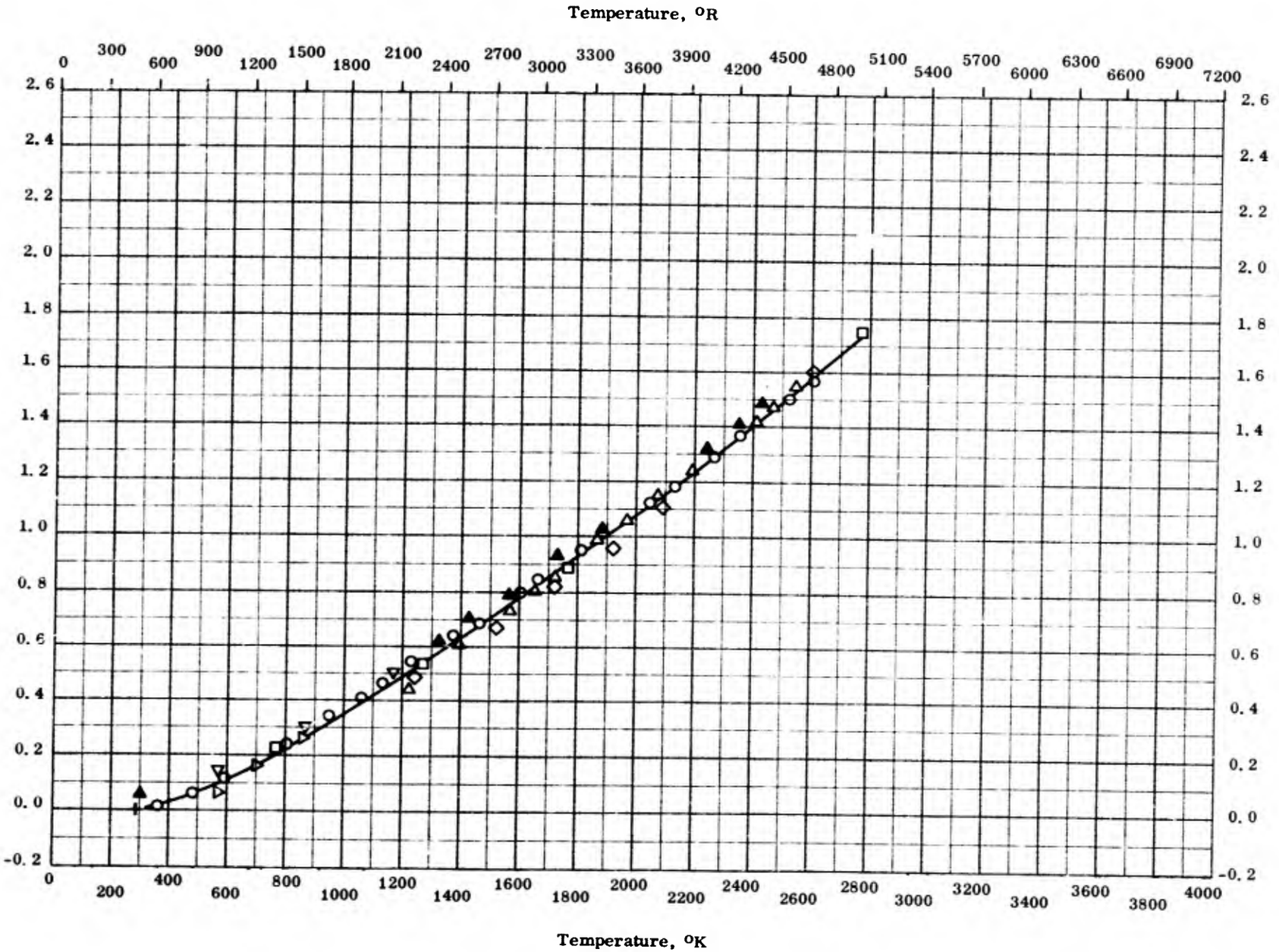


THERMAL DIFFUSIVITY -- BORON CARBIDE

THERMAL DIFFUSIVITY -- BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-1	1168-2583		75.97 B, 21.18 C, 0.40 Si, 0.27 Fe, 0.07 B_2O_7, and 0.015 Al_2O_3; density 156 lb ft^{-3}.	Hot-pressed and fired at 3940 F.

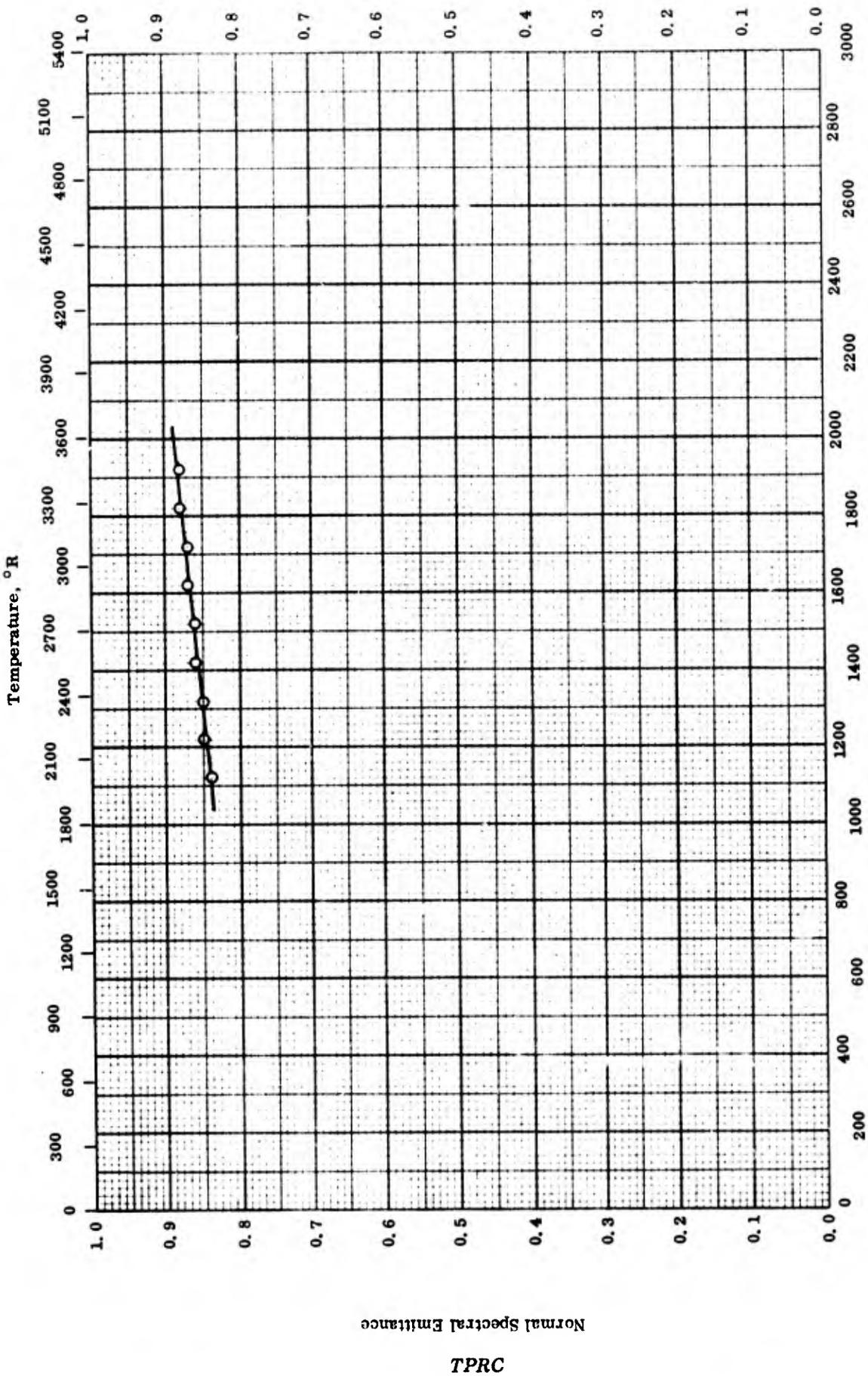


THERMAL LINEAR EXPANSION -- BORON CARBIDE

THERMAL LINEAR EXPANSION — BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-1	300-2605	2	B_4C from carborundum Co.; 75.97 B, 21.18 C, 0.40 Si, 0.27 Fe, 0.07 B_2O_7, and 0.015 Al_2O; density 156 lb ft^{-3}; dimensions 1/2 in. diameter by 6 in. long.	Hot pressed and fired at 3940 F; expansion measured in argon with heating of approx 5 F per min.
□	60-23	298-2773		B_4C.	
△	58-8	301-2541		B_4C; density 2.50 g cm^{-3}. [Author's design: sample no. AZ-1]	Hot pressed; expansion measured in argon.
▲	58-8	301-2541		Same as above.	Cooling data for above specimen.
◇	58-8	301-2601		Same as above. [Author's design: sample no. AZ-2]	Hot pressed; expansion measured in argon atm.
▽	56-7	573-1173		B_4C.	Hot molded.
▷	50-8	300-867		79.08 B, 10.79 combined C, and 3.85 free C; density 156 lb ft^{-3}.	Hot pressed in graphite mold; tested at 4 C per min rise.

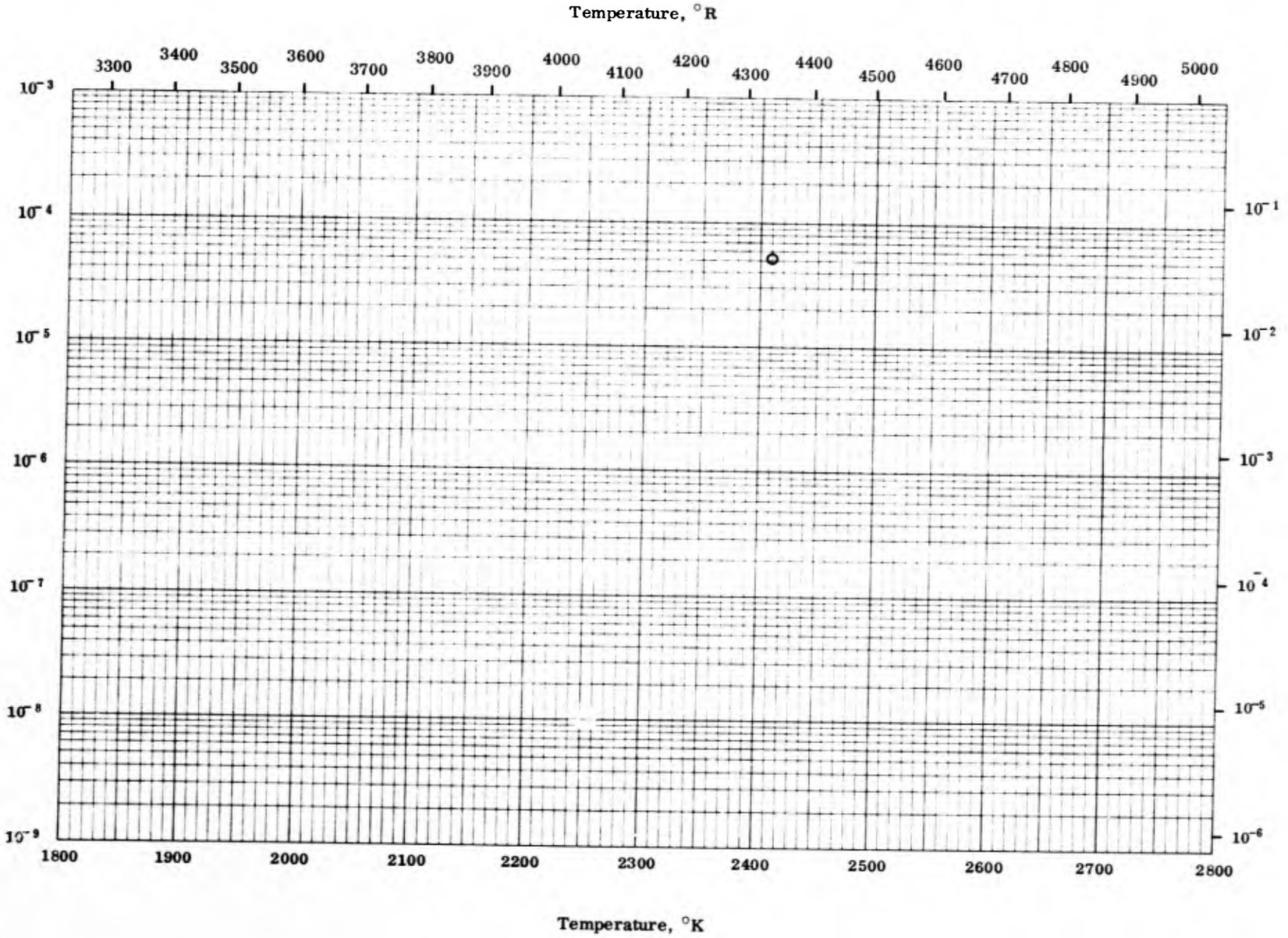


NORMAL SPECTRAL EMITTANCE -- BORON CARBIDE

NORMAL SPECTRAL EMITTANCE — BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range° K	Rept. Error %	Sample Specifications	Remarks
O	60-12	0.65	1123-1923		B_4C; from powder of 2 - 3 μ size; homogeneous layer ~100 μ thick.	Layer of paste on tantalum cylinder; prepared from powder (2 - 3 μ) suspending in nitrate binder ; dried at 320 K.



VAPOR PRESSURE -- BORON CARBIDE

VAPOR PRESSURE -- BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-1	2411		B_4C; 77.50 B, 22.20 C, and 0.07 Fe.	Author believed $B_4 \rightarrow 4B_{(g)} + C_{(s)}$ with little $B_4 \rightarrow 4B_{(g)} + C_{(g)}$; calculation based only on $B_{(g)}$ in vapor.

PROPERTIES OF CHROMIUM CARBIDES

REPORTED VALUES

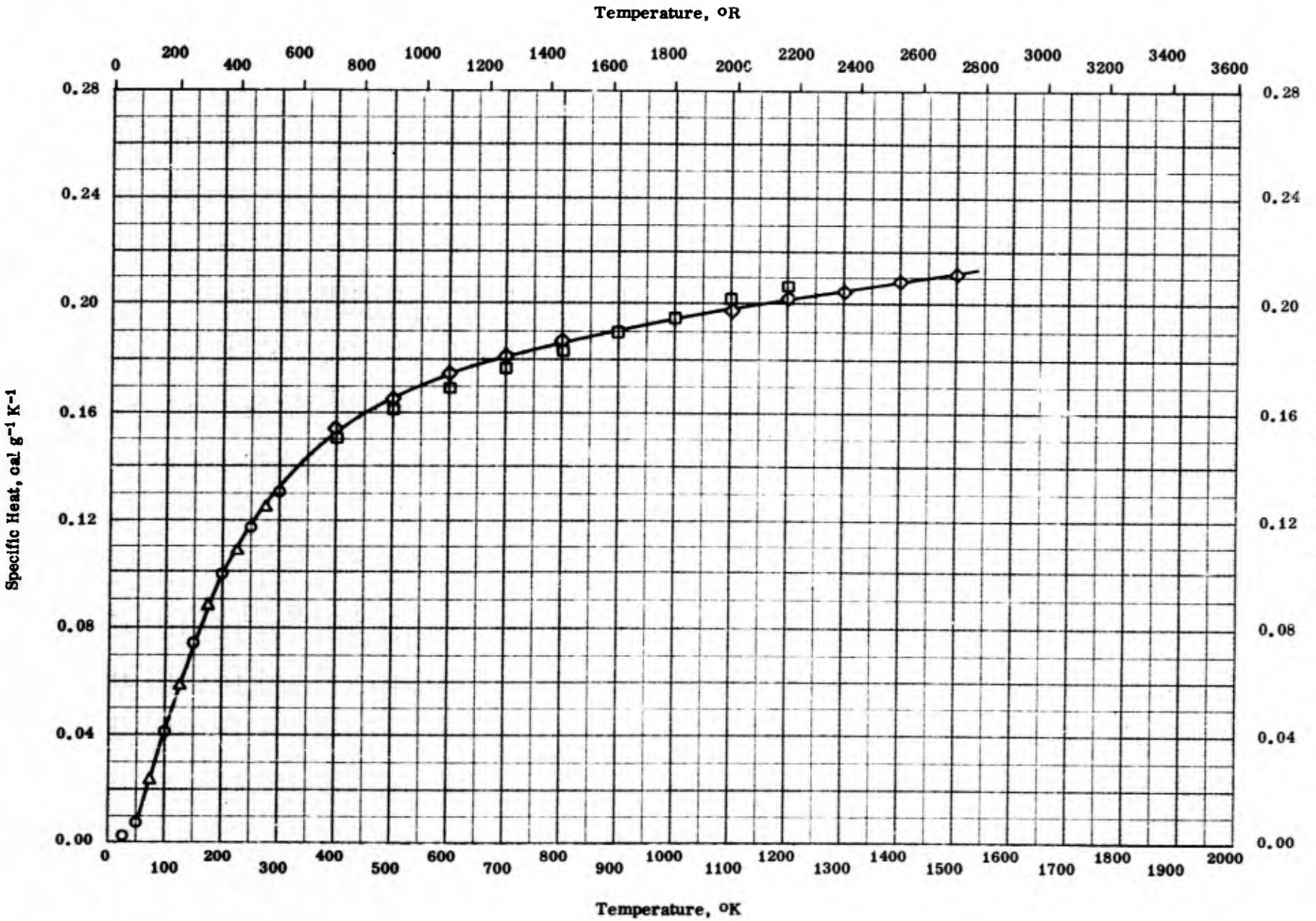
Density:	$g\ cm^{-3}$	$lb\ ft^{-3}$
Cr_3C_2	6.68*	417*
Melting Point:	K	R
○ Cr_3C_2	2163	3894
□ CrC	2273	4099
△ Cr_7C_3	1938	3488
▽ $Cr_{23}C_6$	1823	3281

*Handbook of Chemistry and Physics (Ref. 64-18)

PROPERTIES OF CHROMIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	2163		Cr_3C_2.	Decomposition temperature.
△	56-8	1938		Cr_7C_3.	Same as above.
▽	56-8	1823		$Cr_{23}C_6$.	Same as above.
□	60-8	2273		CrC.	

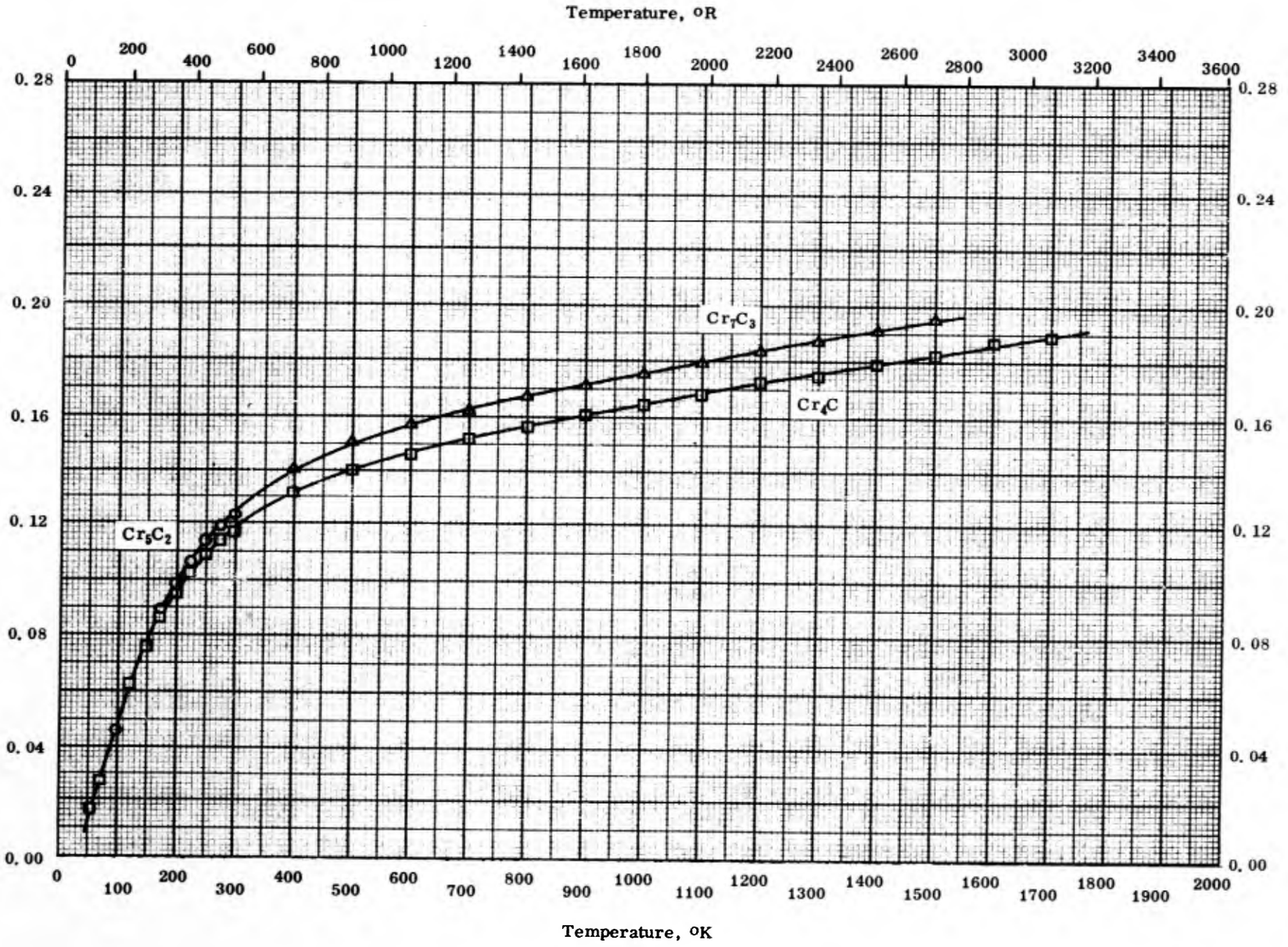


SPECIFIC HEAT -- TRICHROMIUM DICARBIDE

SPECIFIC HEAT -- TRICHROMIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-9	13-300		Cr_3C_2; 86.2 Cr, 13.2 C, small amount Cr, and trace of Al, Cu, Fe, and Mg.	Sample prepared from Cr_2O_3 and lampblack in H_2 furnace at 1525 C.
□	54-7	273-1200	0.4	Same as above.	Same as above.
△	44-2	53-298		98.67 Cr_3C_2, 0.98 Cr_2O_3, and 0.25 free C.	
◇	44-2	298-1500		Same as above.	

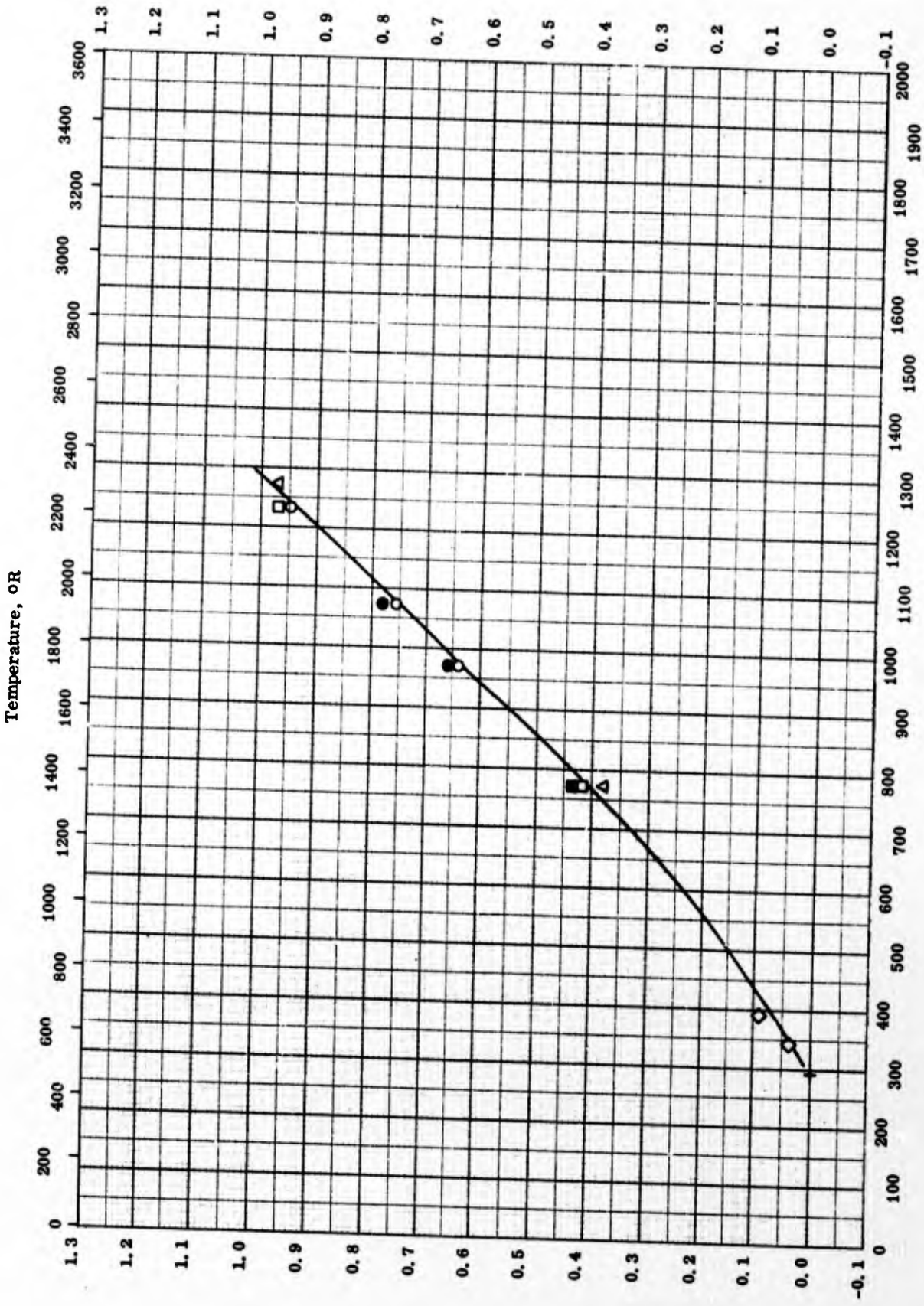


SPECIFIC HEAT -- OTHER CHROMIUM CARBIDES

SPECIFIC HEAT -- OTHER CHROMIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	44-2	55-298		99.6 Cr_5C_2 and 0.4 Cr_2O_3.	
□	44-2	55-1700		~100 Cr_4C.	
△	44-2	54-1500		~ 100 Cr_7C_3.	

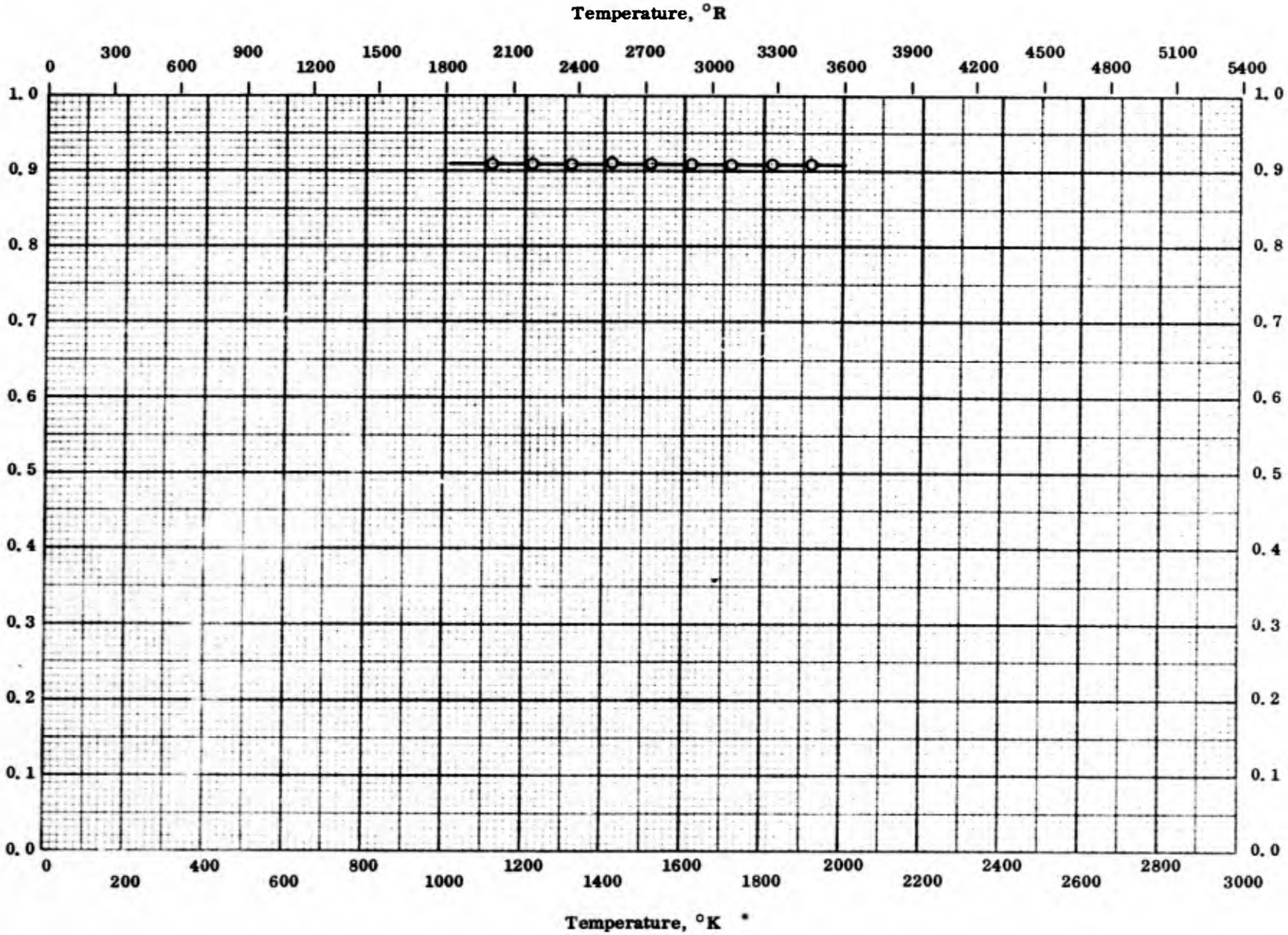


THERMAL LINEAR EXPANSION — TRICHROMIUM DICARBIDE

THERMAL LINEAR EXPANSION -- TRICHROMIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-7	293-1233	± 5	Cr_3C_2; polycrystalline; density 6.36 g cm^{-3}; calculated porosity 4.8 %; dimensions 0.14 in. sq by 1.3 in. long.	Specimen prepared from carbide powder obtained from commercial sources; ball-milled to about 5 μ, hot pressed into 0.16 in. sq by 1.5 in. long rods, and ground to final size; expansion measured in argon.
●	50-7	773-1233	±5	Same as above.	Cooling data for above specimen.
□	50-7	293-1233	±5	Same as above.	Second heating cycle for above specimen.
■	50-7	733-1233	±5	Same as above.	Second cooling cycle for above specimen.
△	60-23	298-1273		Cr_3C_2.	
◇	53-10	293-393		Grade 608.	



NORMAL SPECTRAL EMITTANCE -- HEPTACHROMIUM TRICARBIDE

NORMAL SPECTRAL EMITTANCE -- HEPTACHROMIUM TRICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-12	0.65	1123-1923		Cr_7C_3; from powder of 2-3 μ size; homogeneous layer ~ 100 μ thickness.	Layer of paste on tantalum cylinder, prepared from powder by suspending in nitrate binder; dried at 320 K.

PROPERTIES OF HAFNIUM CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	12.6	790
Melting Point	4160	7490

REPORTED VALUES

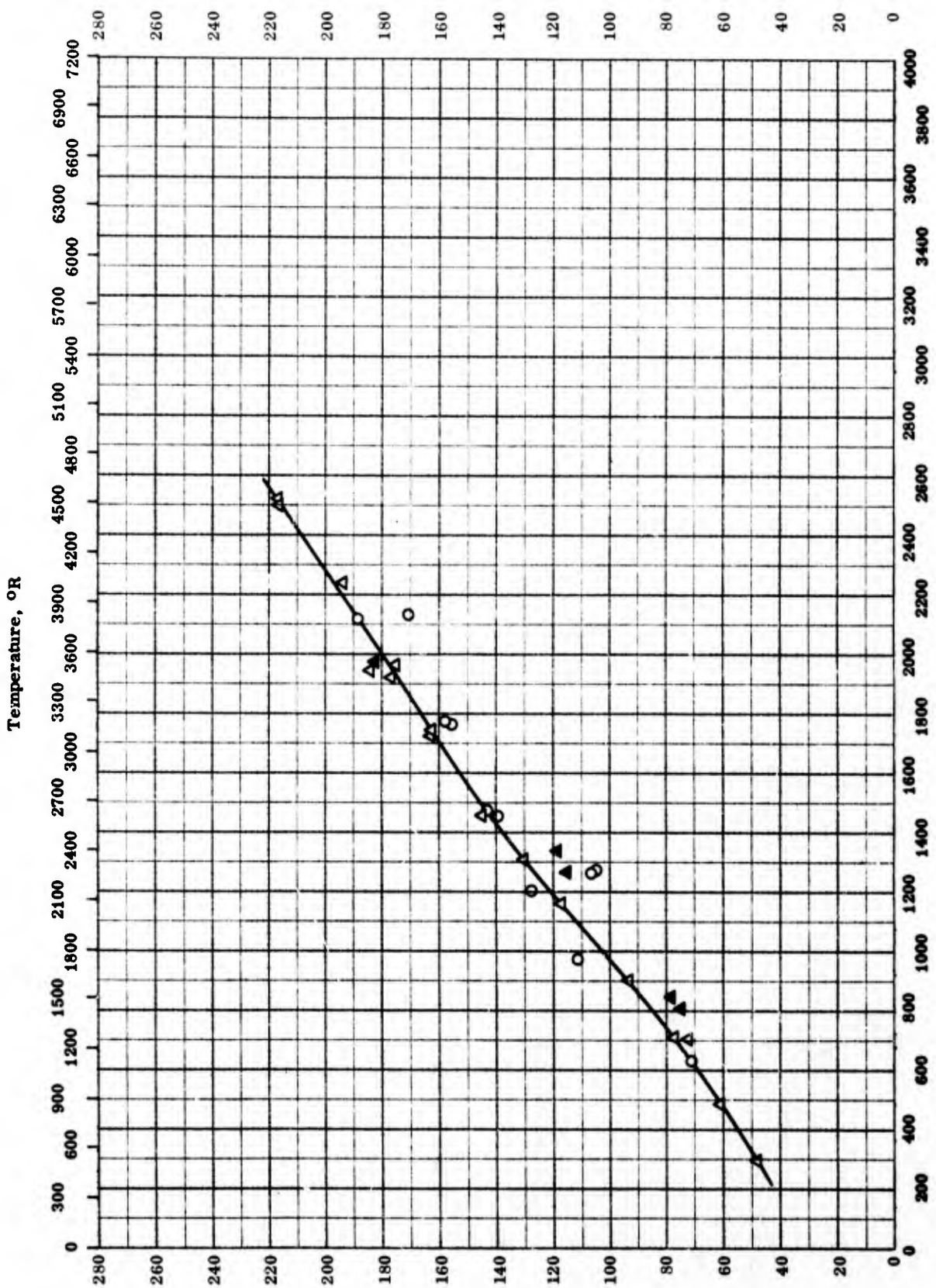
		g cm^{-3}	lb ft^{-3}
Density:	□	11.8-12.6	737-787
	△	12.67	791.0
	◇	10.05	627

		K	R
Melting Point:	○	4163	7494
	▽	4161	7490
	◁	4161 ± 150	7490 ± 270
	▷	4161	7490

PROPERTIES OF HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	4163		HfC.	
□	54-10	298		HfC; 0.075 Al, 0.050 Ti, 0.020 Si, 0.01> P, 0.0025 Mg, 0.001 Fe, and 0.0002 Zr.	Prepared from HfO_2 and lampblack.
△	54-10	298		Same as above.	Same as above; density computed from x-ray measurement of lattice.
◇	62-5	298		HfC.	Hot-pressed and fired near 6500 F; max. exposure temperature 5220 F.
▽	62-46	4161		HfC .	
◁	54-10	4011-4311		HfC.	
▷	60-8	4161		HfC.	

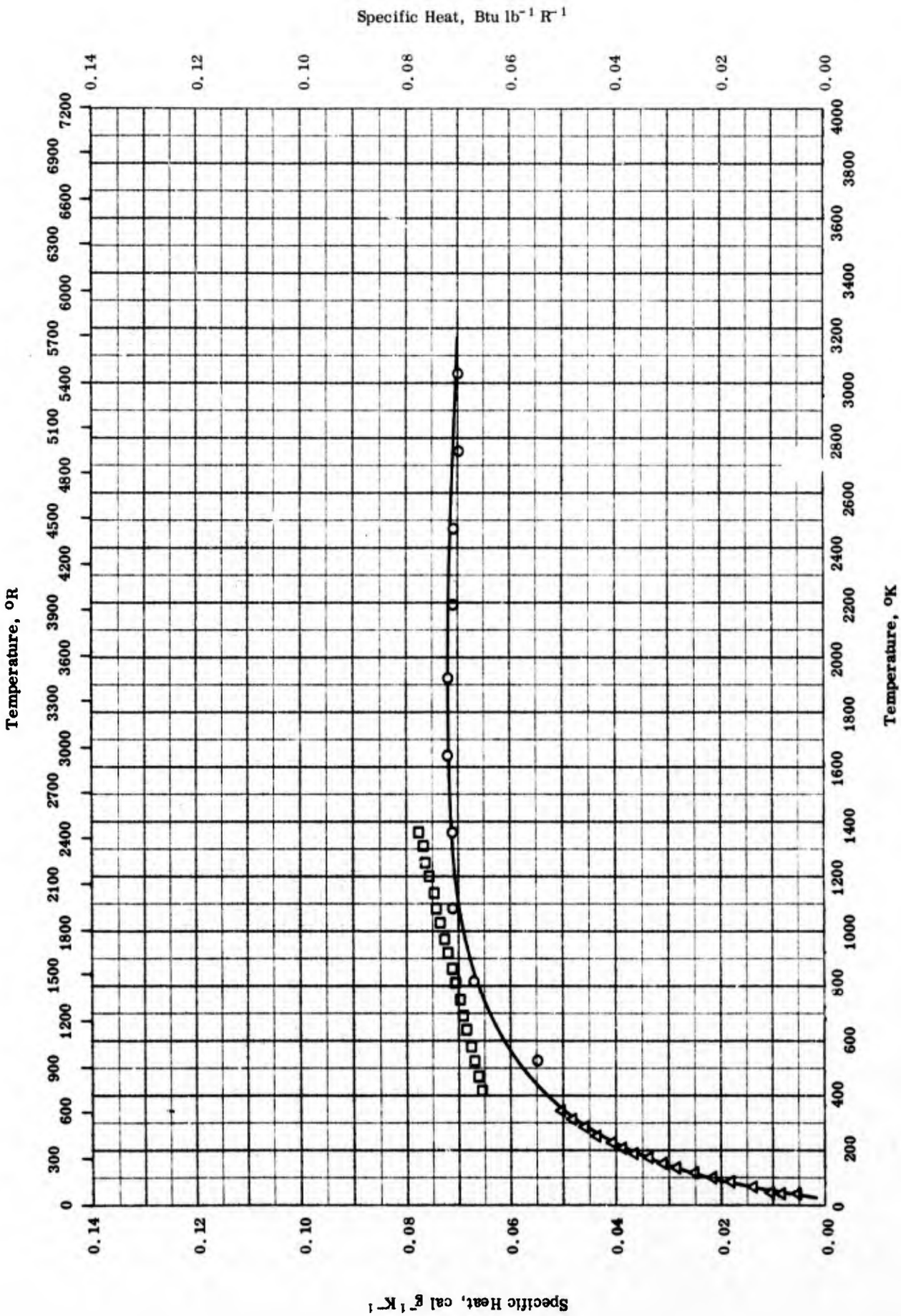


ELECTRICAL RESISTIVITY -- HAFNIUM CARBIDE

ELECTRICAL RESISTIVITY -- HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	296-2133	2.4	HfC; 93.8 Hf, 5.85 C, and 1.0 N.	Hot pressed; max. exposure temperature 5220 F.
△	62-6	297-2522	2.4	Same as above.	Same as above.
▲	62-6	297-2522	2.4	Same as above.	The cooling curve of the above sample.

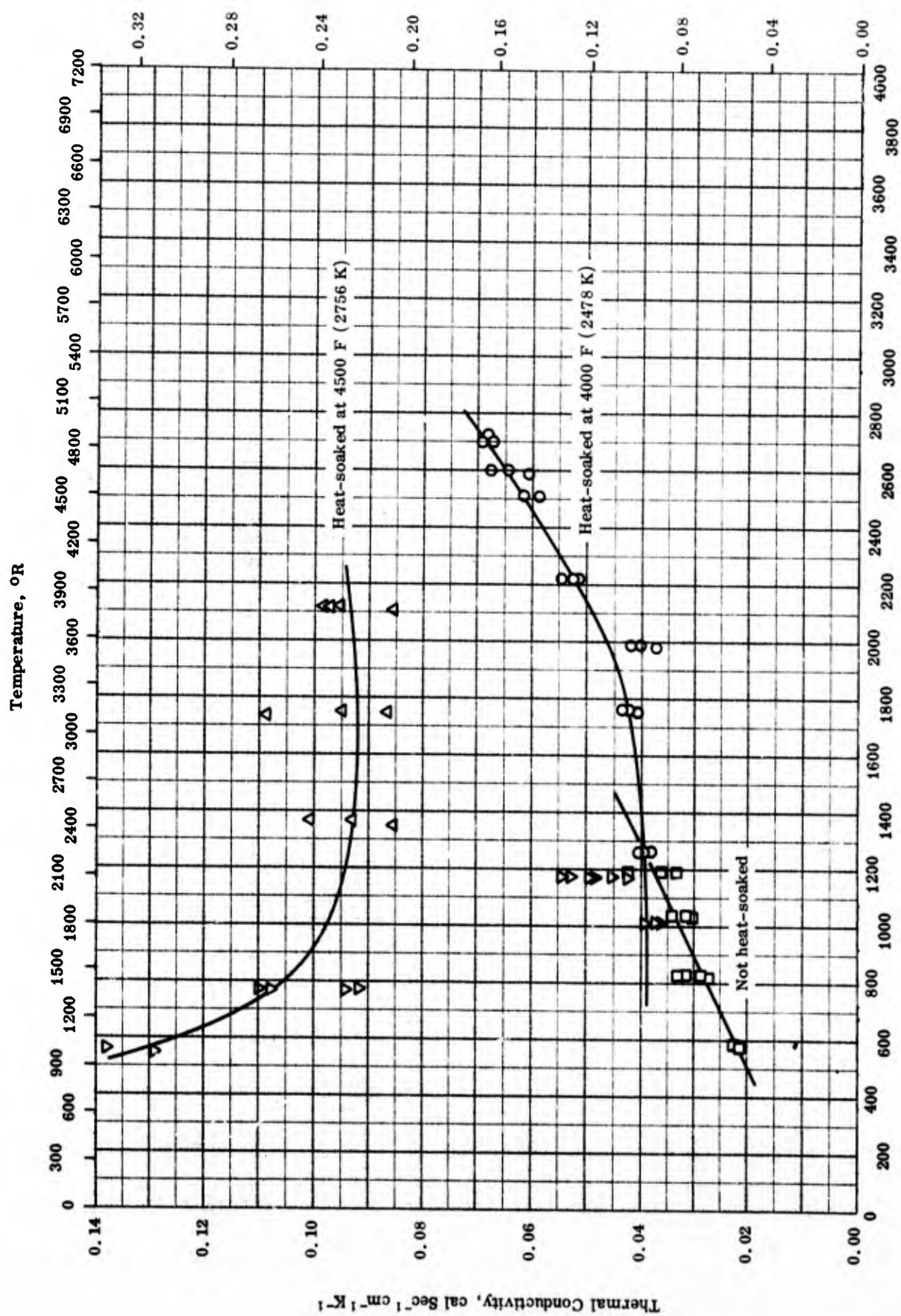


SPECIFIC HEAT -- HAFNIUM CARBIDE

SPECIFIC HEAT -- HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-8 also 62-5	533-3033	≤5.0	HfC; before test: 93.8 Hf, 5.85 C, 1.0 N_2, 0.3 Ti, and 0.2 Al; density 750 lb ft^{-3}; after test: 93.9 Hf, 5.73 C, and 0.9 C; density 736 lb ft^{-3}.	Hot pressed.
□	61-4	422-1366	5.0	HfC; 79.8 Hf and 5.38 C. [Author's design. X-1.]	Sample made from powder HfC by spraying with powder gun using N_2 - H_2 plasma gas and 8 ft^3 hr^{-1} N_2 carrier gas.
△	64-5	5-350		HfC: 6.12 C, 0.035 Zr, 0.031 N_2, 0.005 Fe, 0.003 O_2, 0.002 Ti and Si, and 0.001 H_2, Cu, Mg, and Mn.	Zone refined.

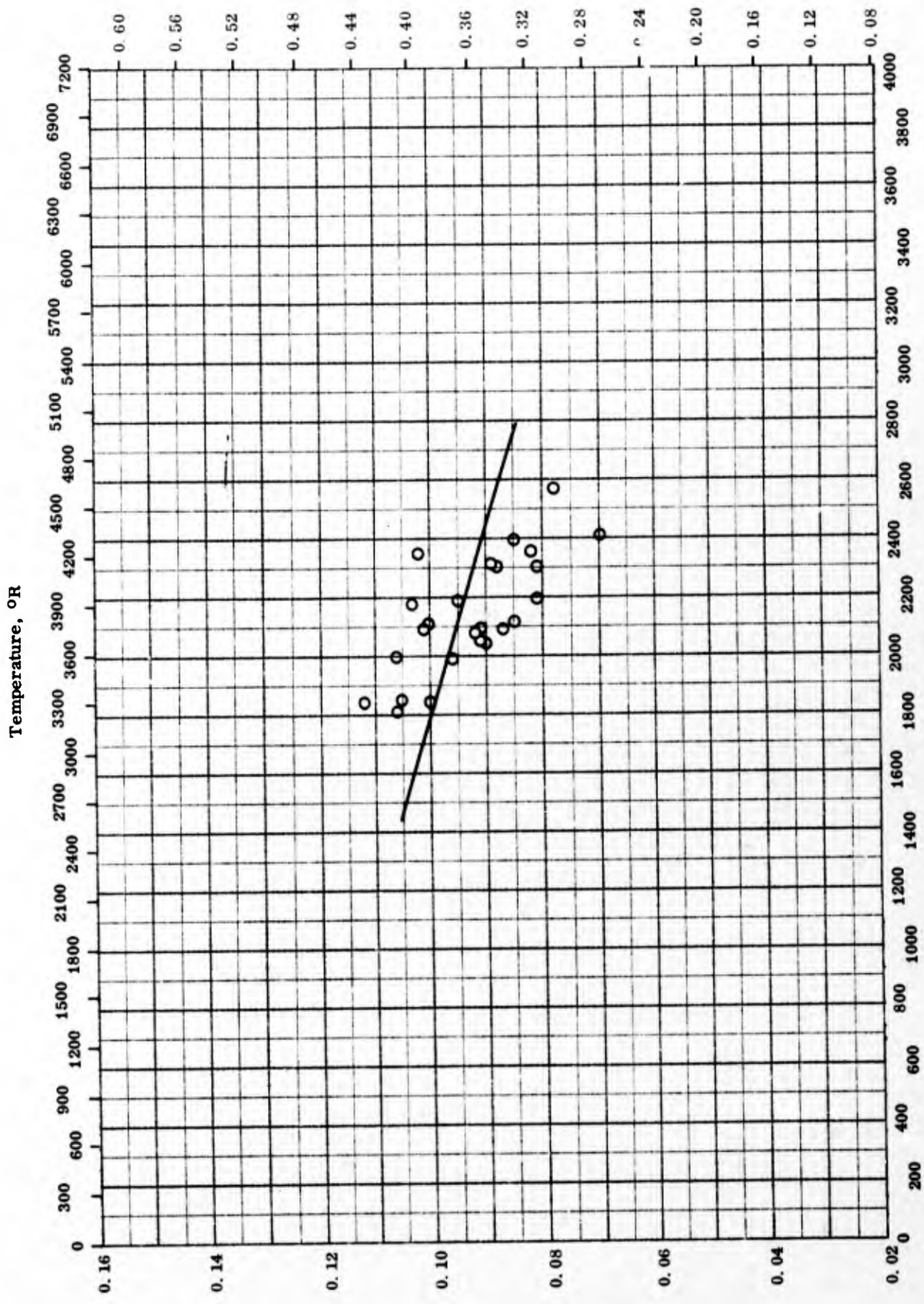


THERMAL CONDUCTIVITY -- HAFNIUM CARBIDE

THERMAL CONDUCTIVITY -- HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	1261-2718	5-7	HfC.	Ground and polished thoroughly; heat-soaked at 4000 F; sample found broken on post inspection.
□	62-5	580-1192	2-4	HfC; density 627 lb ft^{-3}.	Hot-pressed; fired at 4500 F.
△	62-5	1351-2122	2-4	Same as above.	The above sample measured after being heat-soaked
▽	62-5	553-1174	2-4	Same as above.	Same as above.

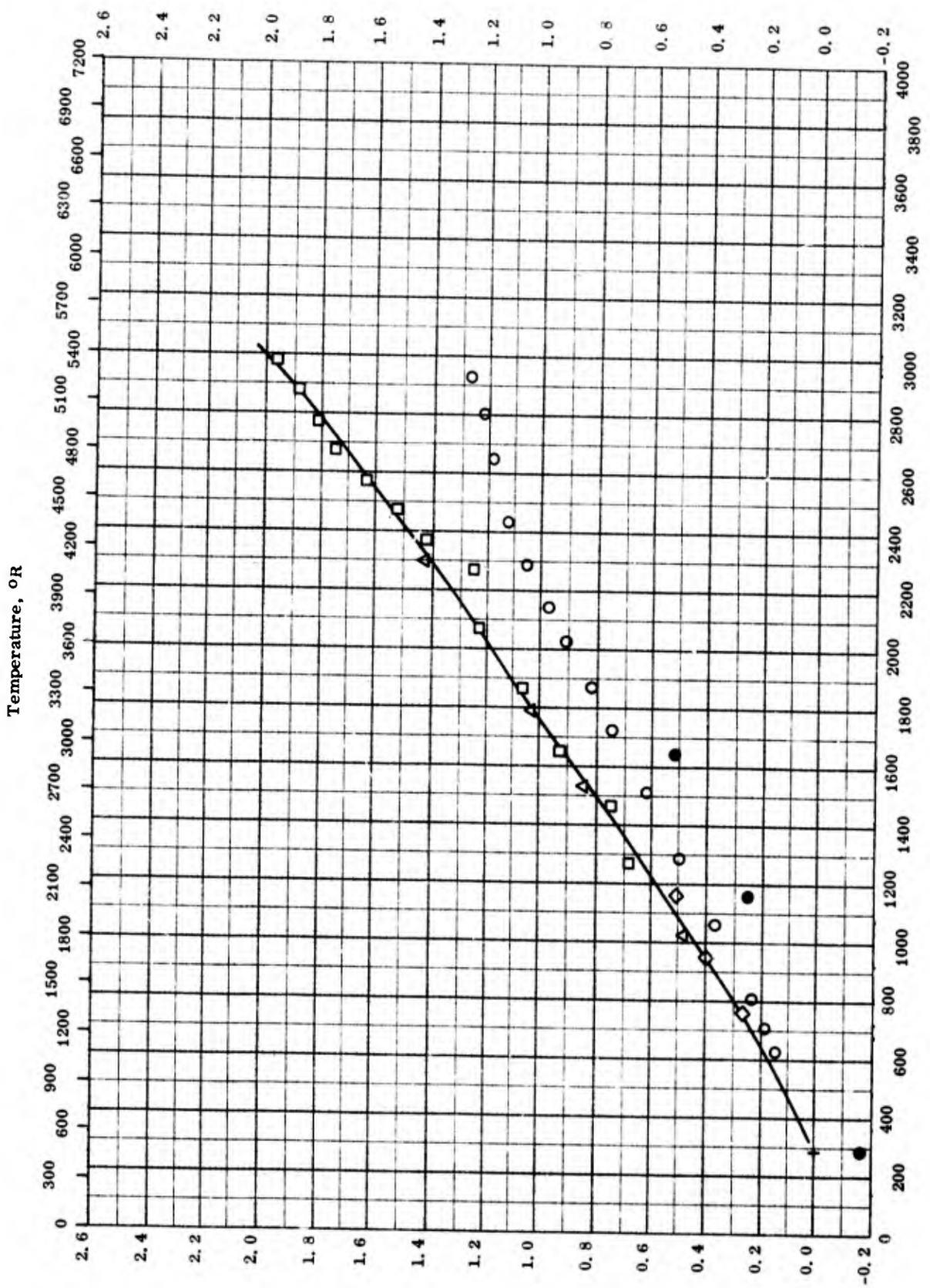


THERMAL DIFFUSIVITY -- HAFNIUM CARBIDE

THERMAL DIFFUSIVITY -- HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-3	1813-2568		HfC; 94.3 Hf + Zr, 5.52 C, 2.4 Zr, and 0.40 O by chemical analysis of raw powder and 92.5 Hf, 5.5 C, 2 Zr, 0.1<V, 0.05 Ti, 0.05>Fe, 0.05>Mo, 0.02 Si, 0.01 Ag, 0.01 B, and 0.01 Mg by chemical analysis of a as received sample; average grain size 7 (ASTM); density 12.90 g cm^{-3}.	Hot-pressed.

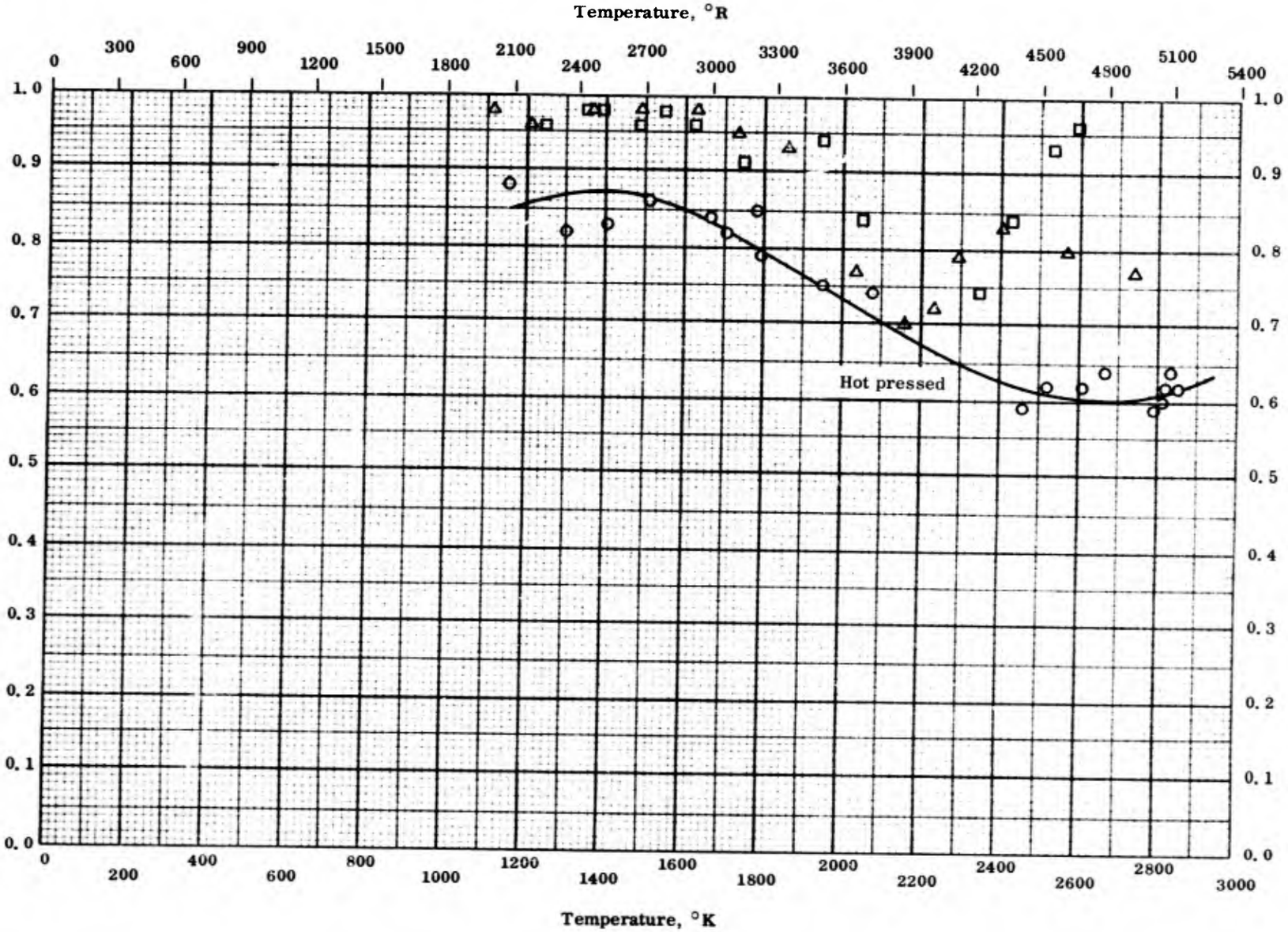


THERMAL LINEAR EXPANSION — HAFNIUM CARBIDES

THERMAL LINEAR EXPANSION -- HAFNIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	294-2928	2	HfC from Carborundum Co.; before exposure 93.8 Hf, 5.85 C and 1.0 N, elements found by semi-quantitative emission spectrography 0.2 Al and 0.3 Ti; after exposure 93.9 Hf, 5.73 C, and 0.9 N; density at 25 C before exposure 11.2 g cm^{-3}, after exposure 11.2 g cm^{-3} (by ASTM method B 311 - 58); initial length 3.0040 in., final length 3.0015 in. [Author's design: Run SRI - E 28]	Hot pressed and fired near 6500 F; measured in helium atm.
●	62-5	294-2928	2	Same as above.	Cooling data for above sample.
□	64-14	301-2981		HfC from Aerospace Corp. with C/Hf ratio of 0.88; prepared from nuclear grade hafnium sponge (0.15 O) and AGOT carbon (approx 15 wt % initial melt)	Vacuum arc cast, pulverized to <100 mesh, ground to 325 mesh, made into a slurry of 0.1 g powdered carbide with 0.5 ml binder (Duco cement and acetone 1:20 by volume), and dried; measured with x-ray diffractometer aligned on (111) reflection in helium atm.
◇	61-20	293-1163		Almost stoichiometric composition.	
△	63-31	298-2299		$HfC_{0.95}$; 91.48 Hf, 7.85 C, 2.01 free carbon, 0.55 Zr, 0.08 N, 0.006 O, 0.02 Ti; total impurity 2.75; total analysis 100.04; approx average particle size of reacted powder 7 microns.	Prepared from HfO_2 and carbon reacted at about 2480 C for 1 hr, cold pressed with camphor lubricant at 14000 psi, and sintered in vacuum at 1900 C for 1 hr; x-ray diffraction method, data obtain from (511/333) and (440)



NORMAL TOTAL EMITTANCE — HAFNIUM CARBIDE

NORMAL TOTAL EMITTANCE — HAFNIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	1155-2850	10	HfC; density 12 g cm^{-3}.	Hot-pressed; measured in argon atmosphere; first run.
△	62-6	1116-2738	10	Same as above.	Same as above; second run.
□	62-6	1114-2597	10	Same as above.	Same as above; third run.

PROPERTIES OF IRON CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	7.694*	480*
Melting point	1923	3461

*Handbook of Chemistry and Physics (Ref. 64-18)

REPORTED VALUES

Melting Point	K	R
	○ 1923	3461

PROPERTIES OF IRON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-28	1923		Fe_3C	

SPECIFIC HEAT -- IRON CARBIDE

TPRC

SPECIFIC HEAT -- IRON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	39-1	68-298	2.0	Fe_3C.	Obtained as difference between specific heat of steel having 1.354 C and pine Fe.

PROPERTIES OF MANGANESE CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.89*	430*
Melting Point.	1793	3228

*Handbook of Chemistry and Physics. (Ref. 64-18)

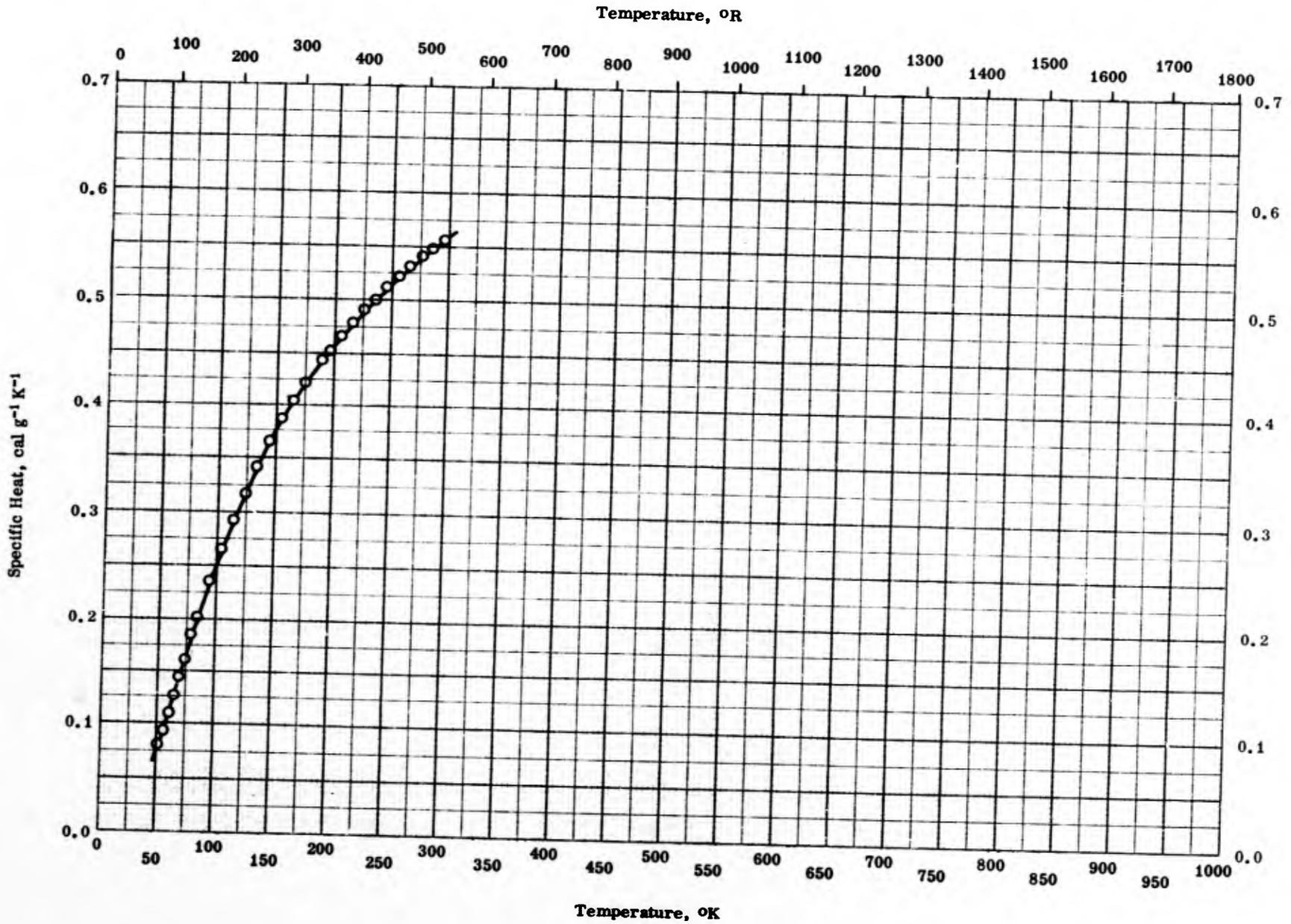
REPORTED VALUES

	K	R
Melting Point		
	O 1793	3228

PROPERTIES OF MANGANESE CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-28	1793		Mn_3C.	

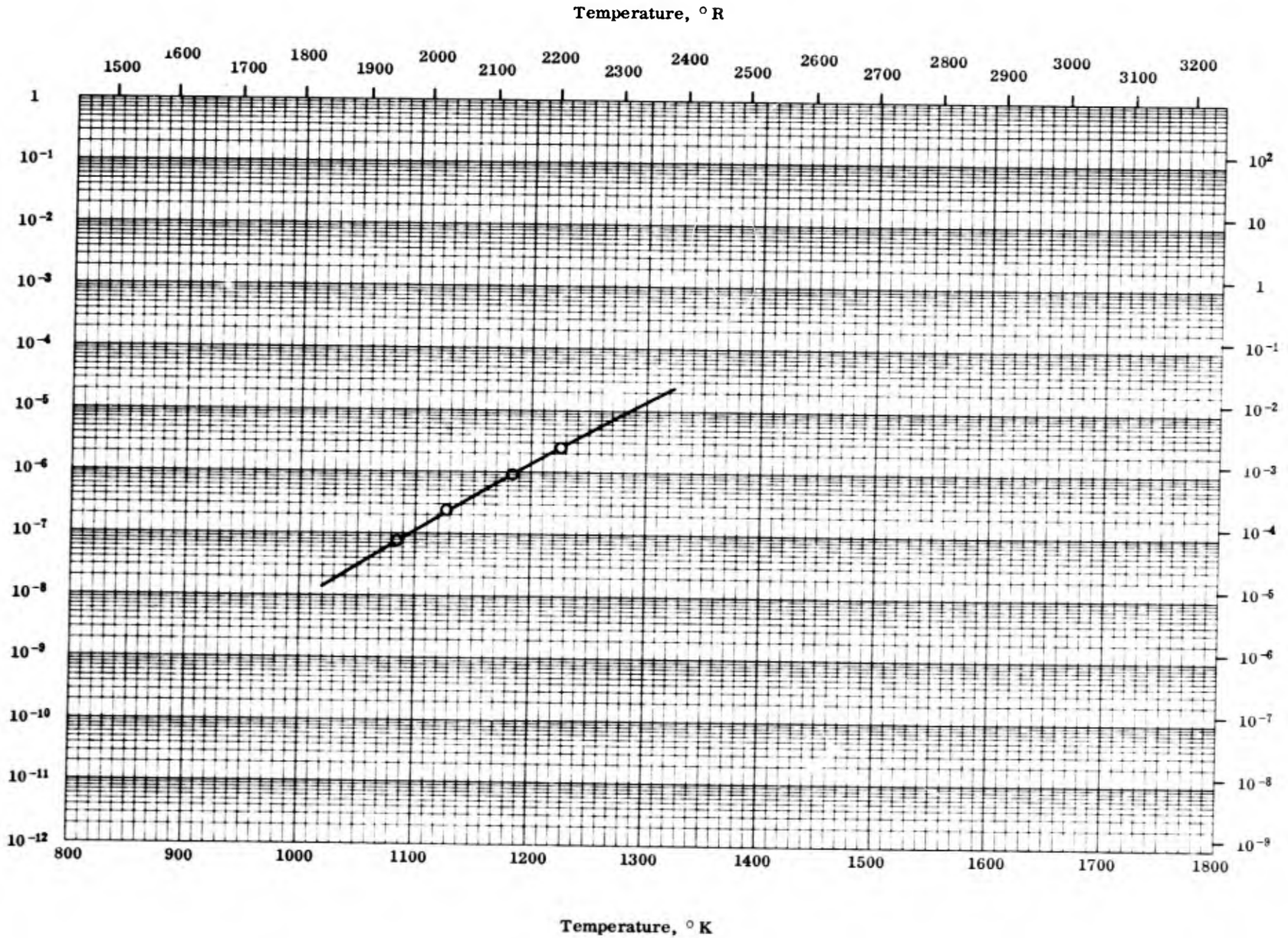


SPECIFIC HEAT -- MANGANESE CARBIDE

SPECIFIC HEAT -- MANGANESE CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	43-2	53-295		Mn_3C; 98.8 Mn_3C, 1.2 Mn, 0.02 > H_2, and 0.015 inorganic residue.	Prepared by heating electrolytic Mn and high purity C for 72 hrs at 850K in vacuum; data corrected for excess Mn.

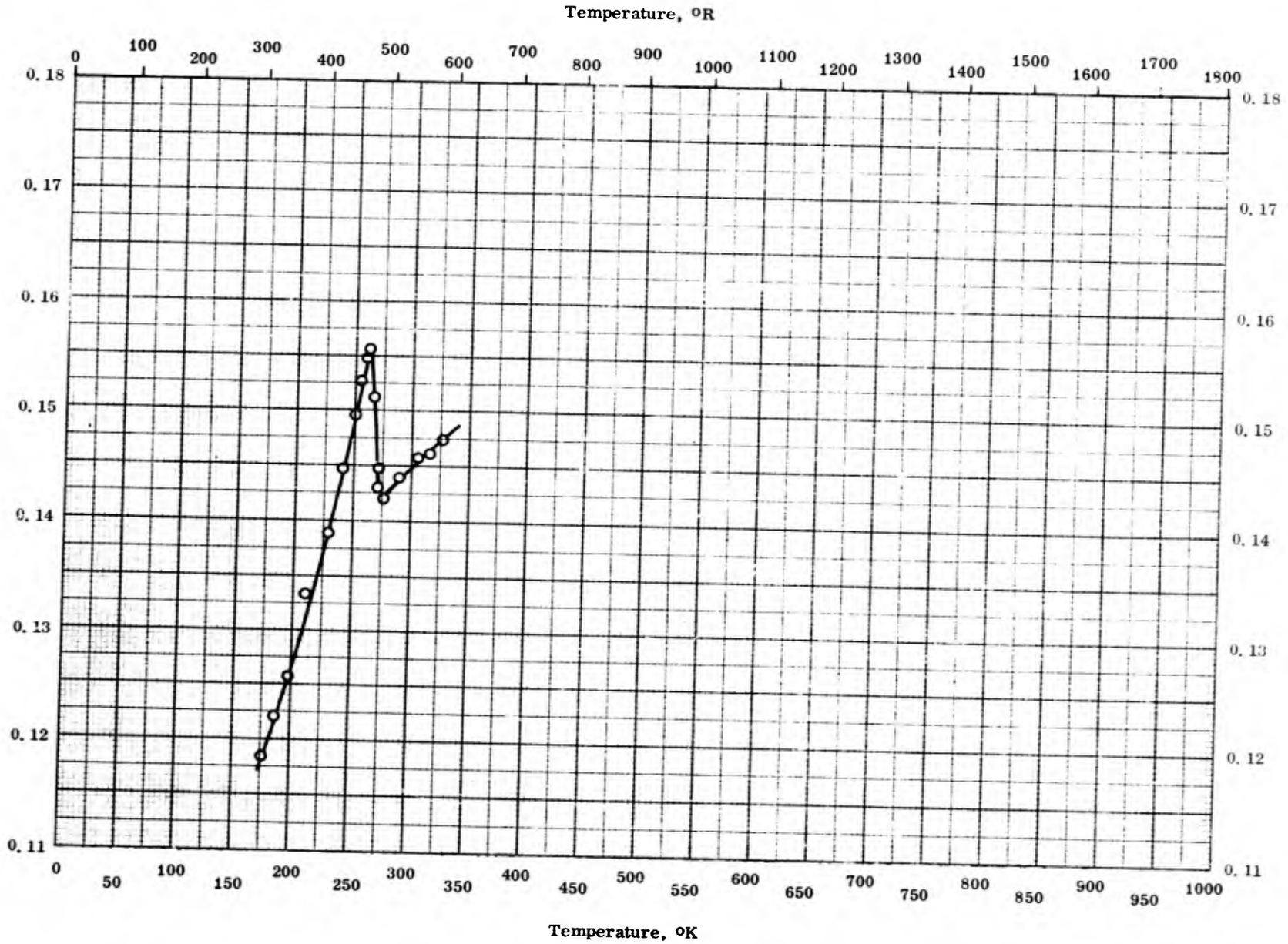


VAPOR PRESSURE -- MANGANESE CARBIDE

VAPOR PRESSURE -- MANGANESE CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-2	1082-1229		Mn_7C_3; prepared from 99.91 pure Mn powder and powdered spectrographic graphite.	Heated 20 hrs at 1350 K.

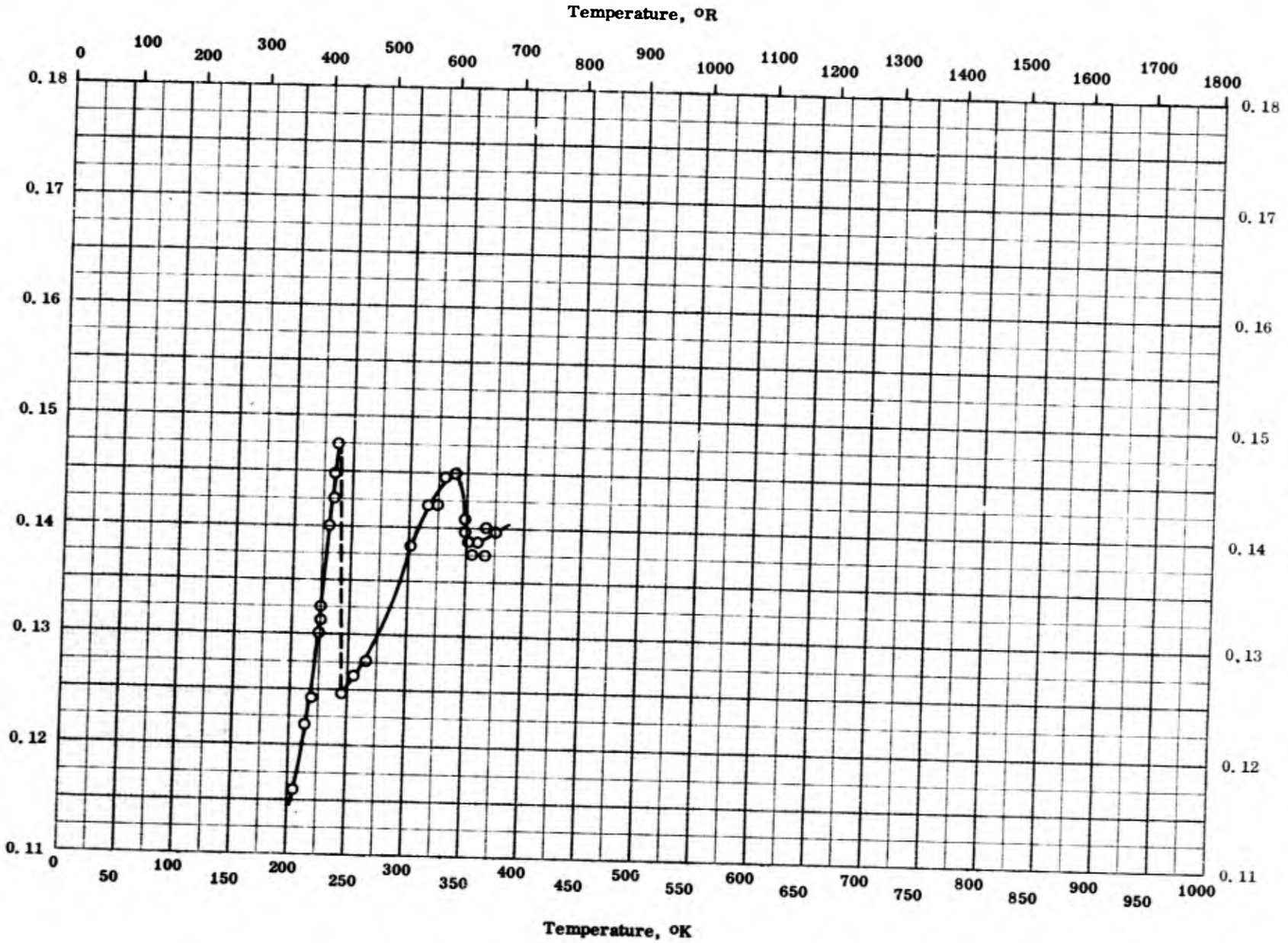


SPECIFIC HEAT -- MANGANESE ALUMINUM CARBIDE

SPECIFIC HEAT -- MANGANESE ALUMINUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-15 also 62-18	173-373	0.5	99.9 < Mn_3 Al C.	



SPECIFIC HEAT -- MANGANESE ZINC CARBIDE

SPECIFIC HEAT -- MANGANESE ZINC CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-15 also 62-18	173-373	0.5	99.9 < Mn_3 Zn C.	

PROPERTIES OF MOLYBDENUM CARBIDES

MOST PROBABLE VALUES*

Property	C.G.S. Units	Brit. Eng. Units
Density	8.9†	555†
Melting Point	2961	5330

*For Mo_2C only.
†Handbook of Chemistry and Physics (Ref. 64-18)

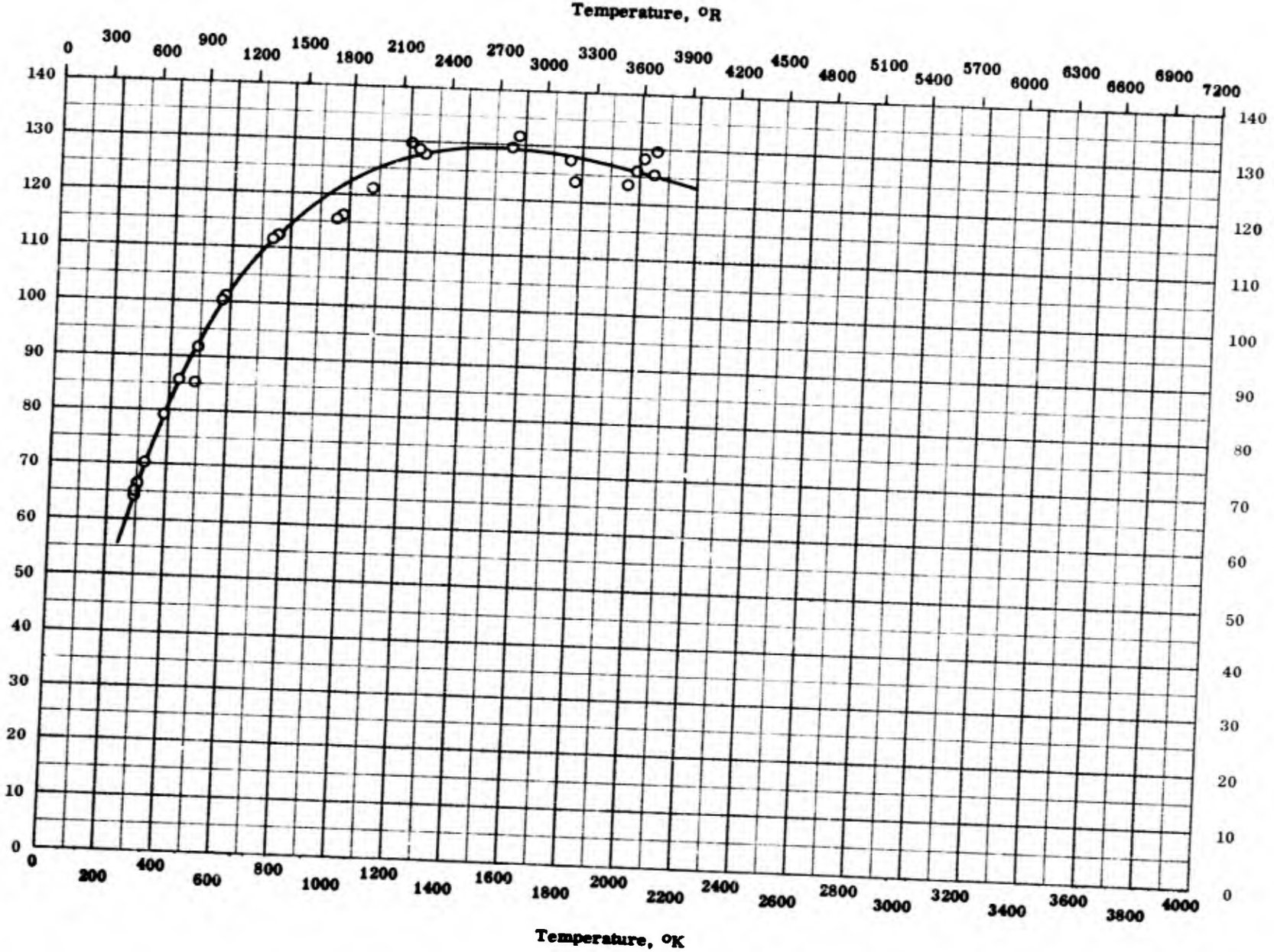
REPORTED VALUES

Melting Point:	K	R
○ Mo_2C	2963	5334
□ Mo_2C	2678	4820
△ Mo_2C	2683 ± 15	4829 ± 27
▽ Mo_2C	2961	5330

PROPERTIES OF MOLYBDENUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	2963		Mo_2C.	
□	55-13	2678		Mo_2C.	M. P. point by calibrated optical pyrometer sighting on liquid-solid interface.
△	60-24	2668-2698		Mo_2C.	
▽	60-8	2961		Mo_2C.	

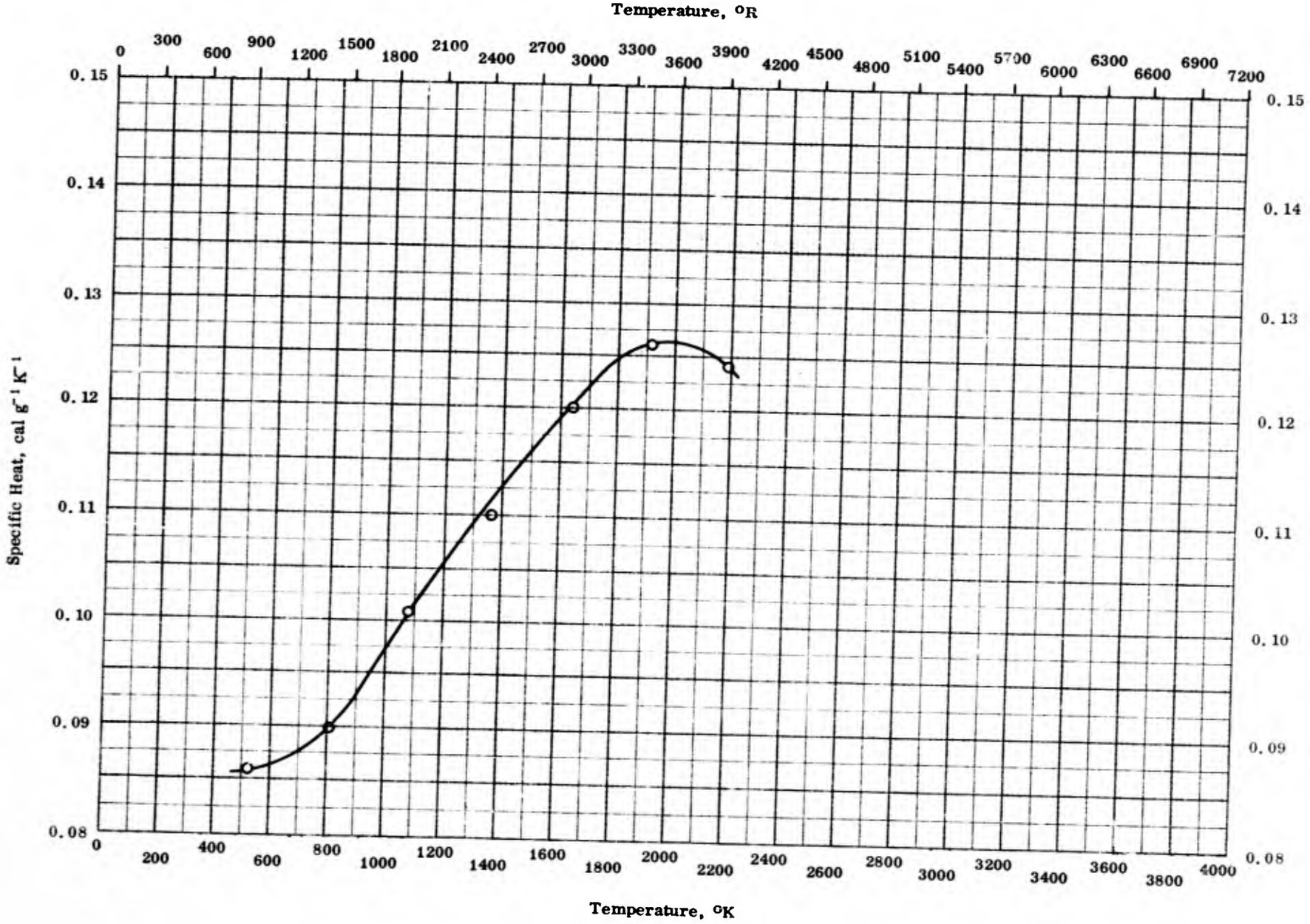


ELECTRICAL RESISTIVITY -- DIMOLYBDENUM CARBIDE

ELECTRICAL RESISTIVITY -- DIMOLYBDENUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	292-2055	2.4	Mo_2C; 92.1 Mo, 5.51 C, and 0.1> N.	Hot-pressed; max. exposure temperature 4450 F.

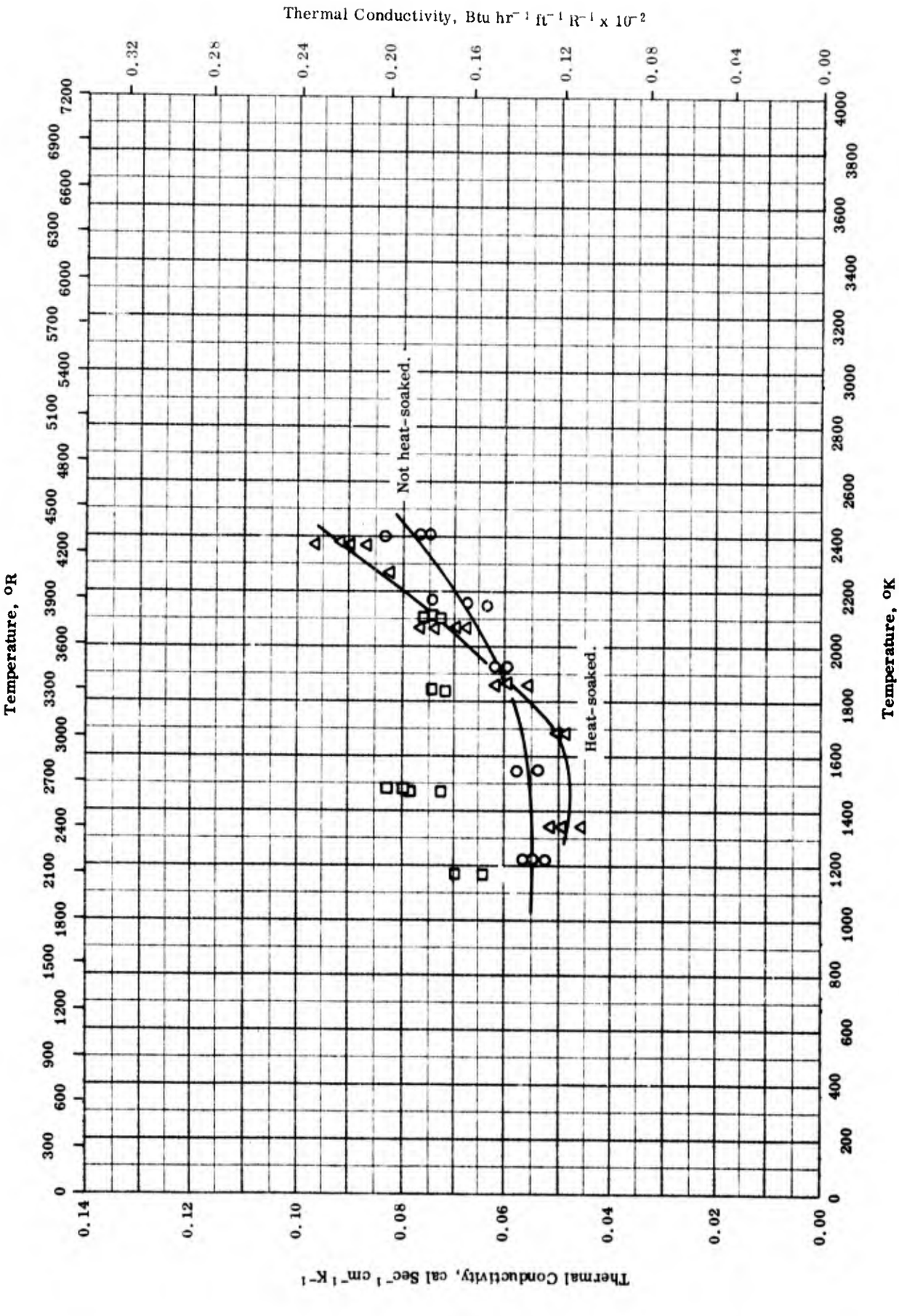


SPECIFIC HEAT -- DIMOLYBDENUM CARBIDE

SPECIFIC HEAT -- DIMOLYBDENUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	533-2200	≤5.0	Mo_2C; before test: 92.1 Mo, 5.51 C, 2.0 Si, 0.6 Fe, 0.3 Ti, 0.2 Al, and 0.1 > N_2; density 560 lb ft^{-3}; after test: 92.4 Mo, 5.39 C, and 0.1 > N_2; density 542 lb ft^{-3}.	Hot pressed; crushed in hardened steel mortar to pass 100 mesh screen.

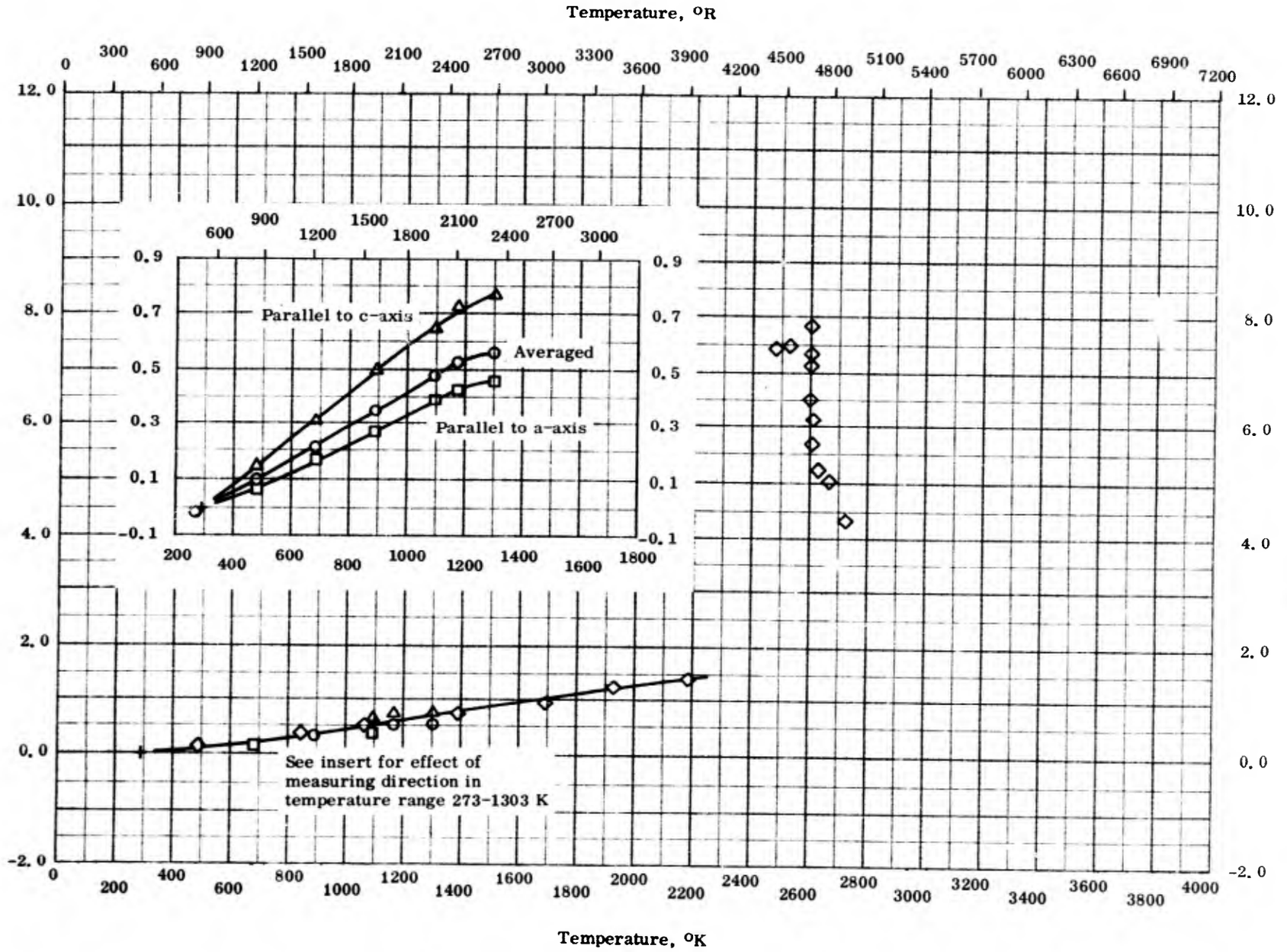


THERMAL CONDUCTIVITY -- DIMOLYBDENUM CARBIDE

THERMAL CONDUCTIVITY -- DIMOLYBDENUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	1222-2414	5-7	Mo_2C.	Ground and polished thoroughly; sample found broken and partially melted on post inspection.
□	62-6	1172-2114	5-7	Mo_2C.	Same as above; sample found broken on post inspection.
△	62-6	1344-2384	5-7	Mo_2C.	Same as above except having furthermore been heat-soaked at 2800 F; sample found broken on post inspection.



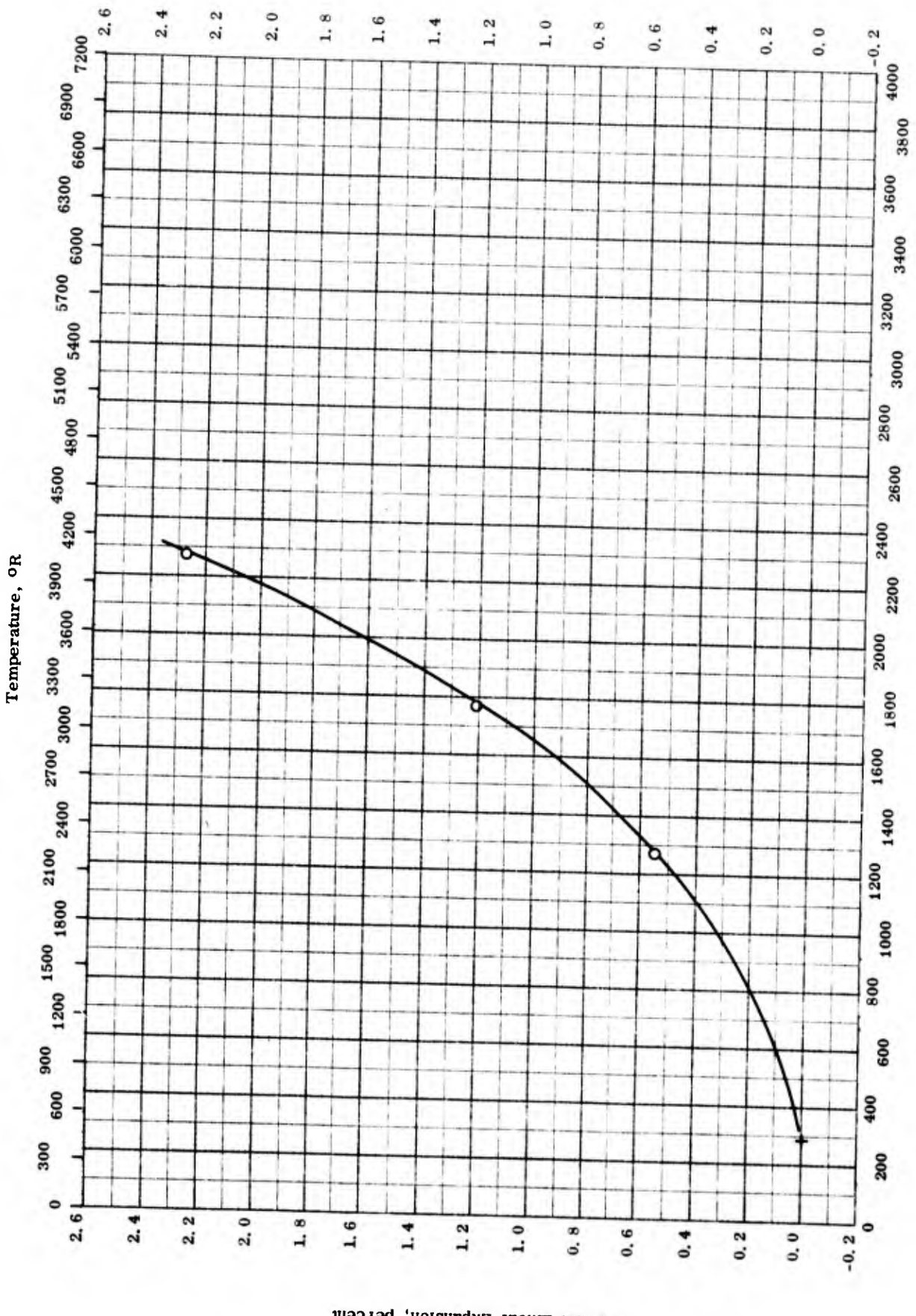
TPRC

THERMAL LINEAR EXPANSION — DIMOLYBDENUM CARBIDE

THERMAL LINEAR EXPANSION -- DIMOLYBDENUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◇	62-6	294-2728	5	Mo_2C from Carborundum Co.; 92.1 Mo, 5.51 C and <0.1 N; elements found by semi-quantitative emission spectrography before exposure 2.0 Si, 0.6 Fe, 0.3 Ti, and 0.2 Al, after exposure 92.4 Mo, 5.39 C, and < 0.1 N; density in g cm^{-3} at 25 C by ASTM method B 311-58 before exposure 8.86, after exposure 8.56; sample melted at 4450 + F; initial length 2.230 in. [Author's design: Run No. E5]	Hot pressed; measured in helium atm.
○	57-19	273-1303		Mo_2C; β-phase; 5.85 C (cf. theor. 5.89), <0.059 Fe.	Averaged measurements of unit cell dimensions measured by x-ray diffraction.
□	57-19	273-1303		Same as above.	Measured parallel to a-axis by x-ray diffraction.
△	57-19	273-1303		Same as above.	Measured parallel to c-axis by x-ray diffraction.

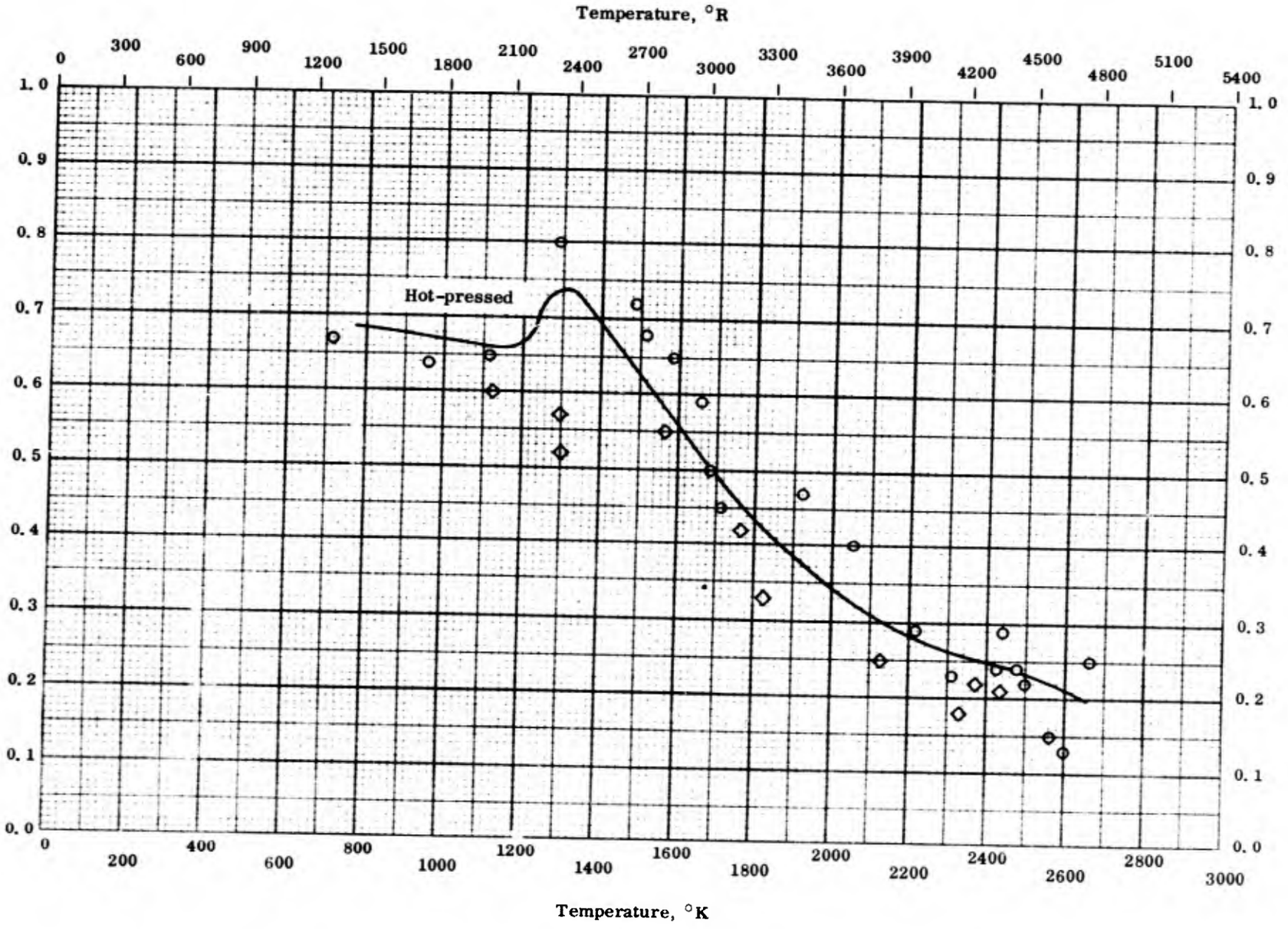


THERMAL LINEAR EXPANSION -- MOLYBDENUM MONOCARBIDE

THERMAL LINEAR EXPANSION -- MOLYBDENUM MONOCARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-29	273-2273		MoC.	Measured in inert atm with pressure of approx 1 in. water above atm pressure.



NORMAL TOTAL EMITTANCE -- DIMOLYBDENIUM CARBIDE

NORMAL TOTAL EMITTANCE -- DIMOLYBDENIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	713-2661	10	Mo_2C, density 8.96 g cm^{-3}.	Hot-pressed; measured in argon atmosphere; first run.
◇	62-6	1127-2438	10	Same as above.	Same as above; second run.

PROPERTIES OF NIOBIUM CARBIDES

MOST PROBABLE VALUES*

Property	C.G.S. Units	Brit. Eng. Units
Density.	7.63	476
Melting Point.	3773	6791

*For NbC only.

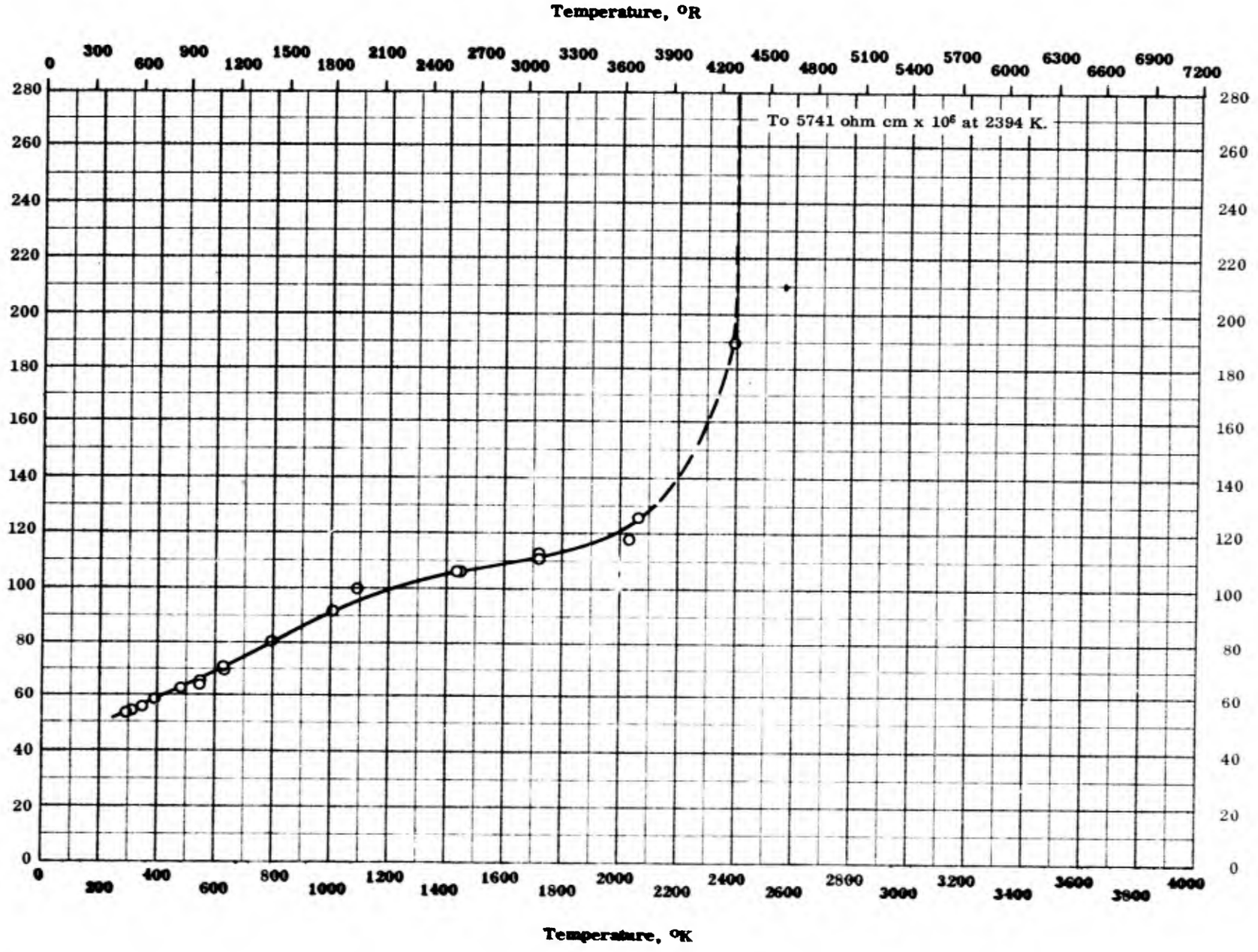
REPORTED VALUES

Density:		g cm^{-3}	lb ft^{-3}
	○	7.63	476
Melting Point:		K	R
	□	3761 ± 12	6770 ± 20
	△	3773	6791
	▽	3753 ± 50	6755
	◇	3773	6791

PROPERTIES OF NIOBIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	298		NbC: 11.3 C, 0.07 N, 0.1 Fe, 0.1 W, and 0.01 >Si, Mn, Mg, Cr, Sn, Ti, Zr, and Ni.	Hot-pressed; max. exposure temperature 4740 F.
□	56-11	3750-3771		NbC.	
△	62-46	3773		NbC.	
▽	60-24	3703-3803		NbC.	
◇	60-8	3773		NbC.	Measured in A.



TPRC

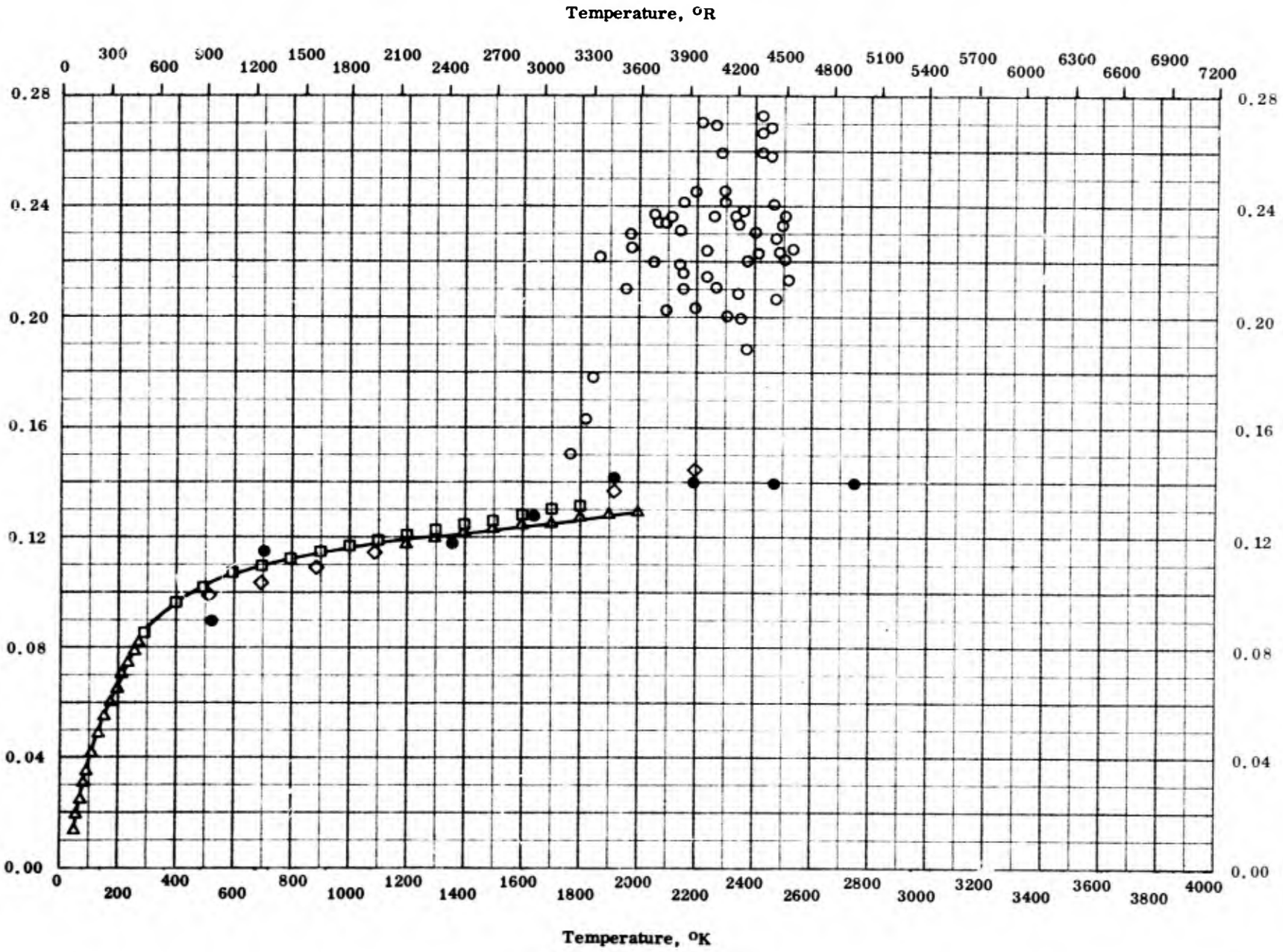
ELECTRICAL RESISTIVITY -- NIOBIUM CARBIDE

Electrical Resistivity, ohm cm x 10⁶

ELECTRICAL RESISTIVITY -- NIOBIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	294-2394	2.4	NbC; 88.9 Nb, 10.8 C, and 0.2 N.	Hot pressed; max. exposure temperature 4820 F.

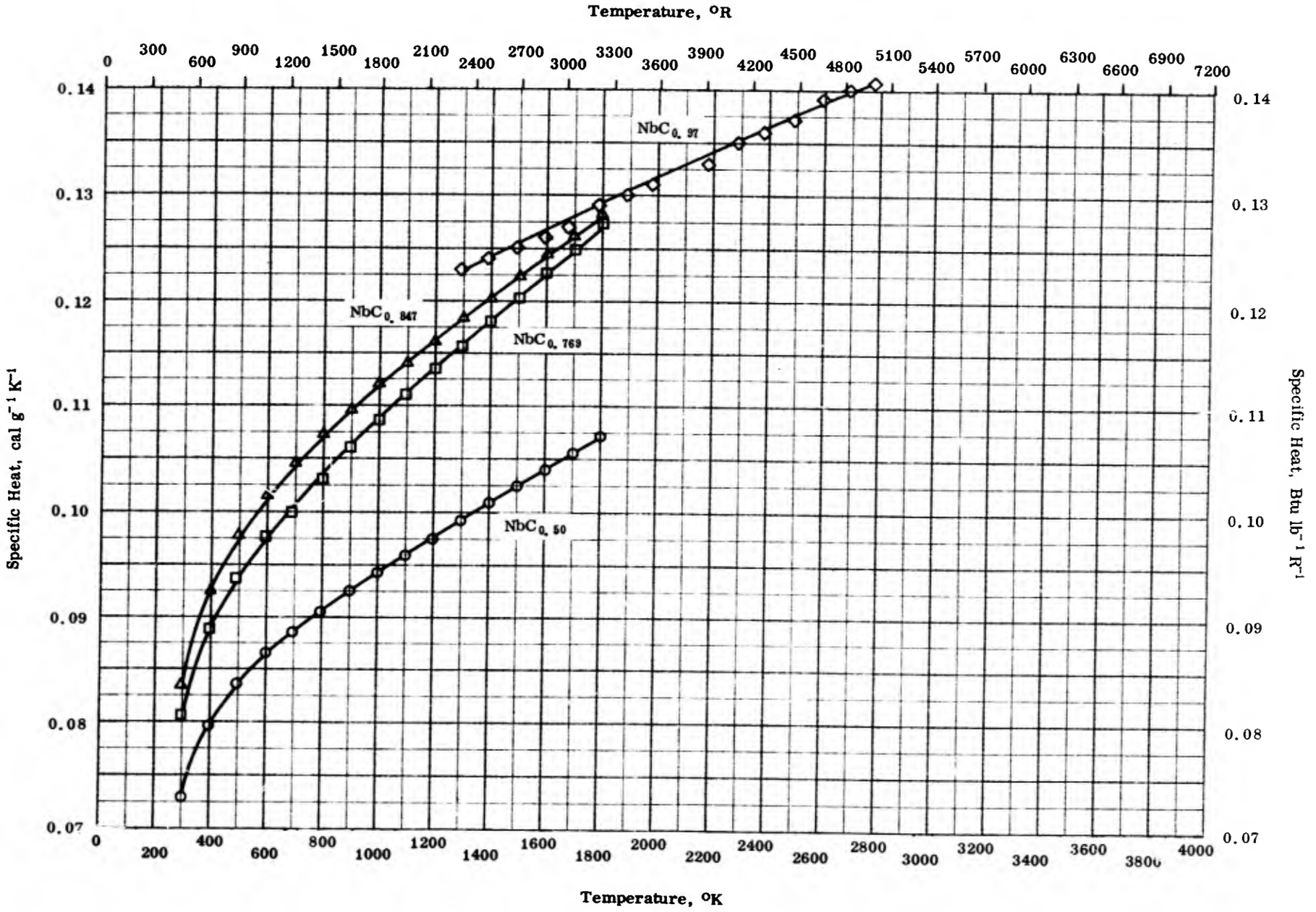


SPECIFIC HEAT -- NIOBIUM CARBIDE

SPECIFIC HEAT -- NIOBIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-16	1763-2529	5.0	NbC; 86.66 Nb, 10.81 total C, 0.01 > free C, 1.82 Ta, 0.47 N_2, 0.22 O_2, 0.06 Fe, and 0.0003 Mg; density 434 lb ft^{-3}.	Hot pressed at 1500 C and 2500 psi for 2 1/2 hrs.
□	60-9	300-1800		Nb C.	
△	64-9	51-200		Nb C; 88.17 Nb, 11.74 total C, 11.35 combined C; 0.07 > N_2, 0.03 O_2, 0.02 Ti, 0.006 Ag, and 0.002 Mn.	
◇	62-20	522-2200		Nb C; 11.79 total C, 10.84 combined C.	Sprayed sample.
●	60-8 also 62-5	533-2755		NbC; 88.42 < Nb, 11.3 C, 0.10 Fe, 0.10 W, 0.07 N_2, 0.01 > Cr, Mg, Mn, Ni, Si, Sn, Ti and Zr; density 476 10 ft^{-3}.	Hot pressed.

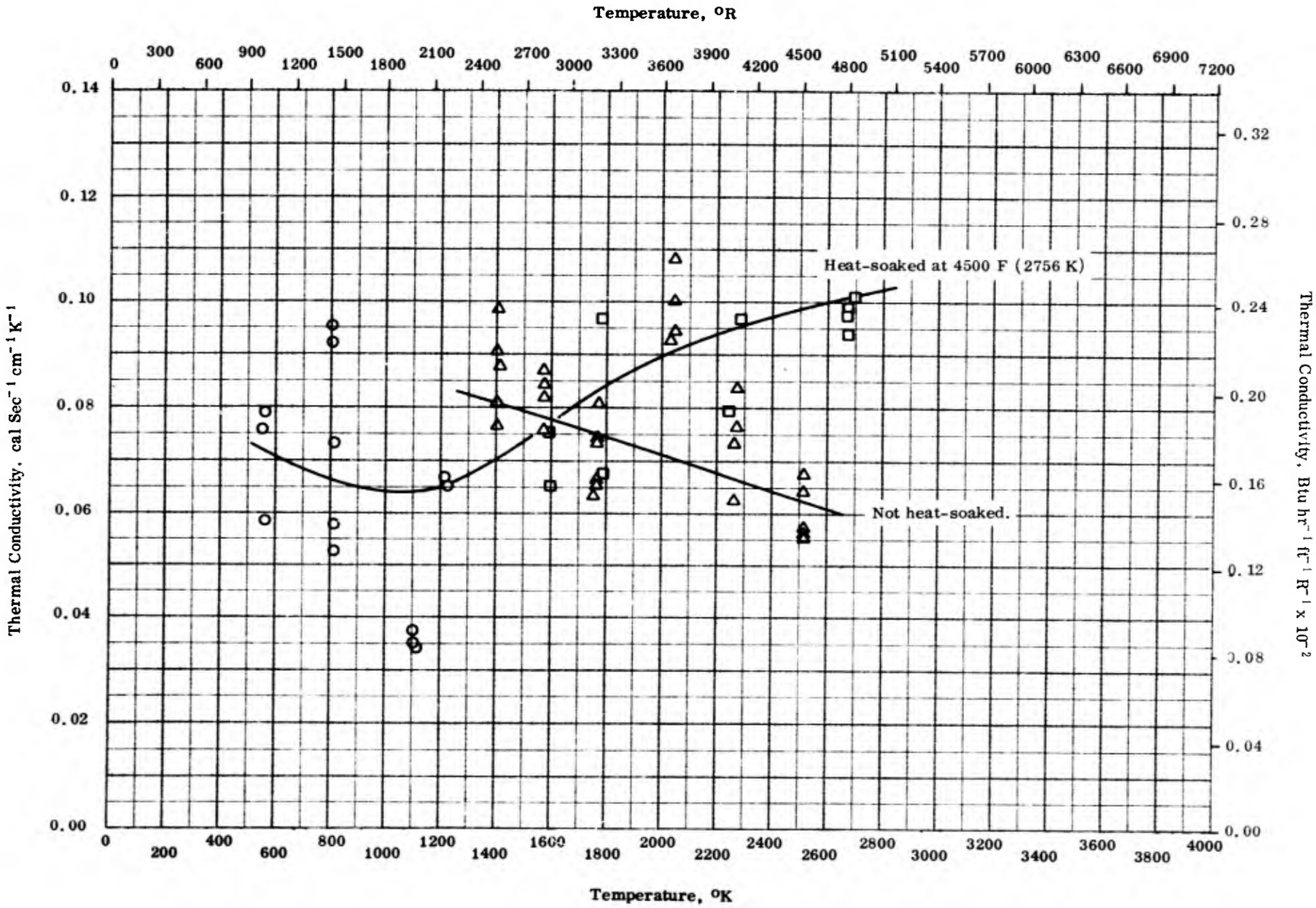


SPECIFIC HEAT -- OTHER NIOBIUM CARBIDES

SPECIFIC HEAT -- OTHER NIOBIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-9	300-1800		Nb $C_{0.50}$.	
□	60-9	300-1800		Nb $C_{0.769}$.	
△	60-9	300-1800		Nb $C_{0.847}$.	
◇	63-11	1289-2778		Nb $C_{0.97}$; 88.78 Nb, 11.10 C, 0.10 W, 0.06 Fe, 0.05, >free C, and 0.05 > Ta.	Hot pressed.

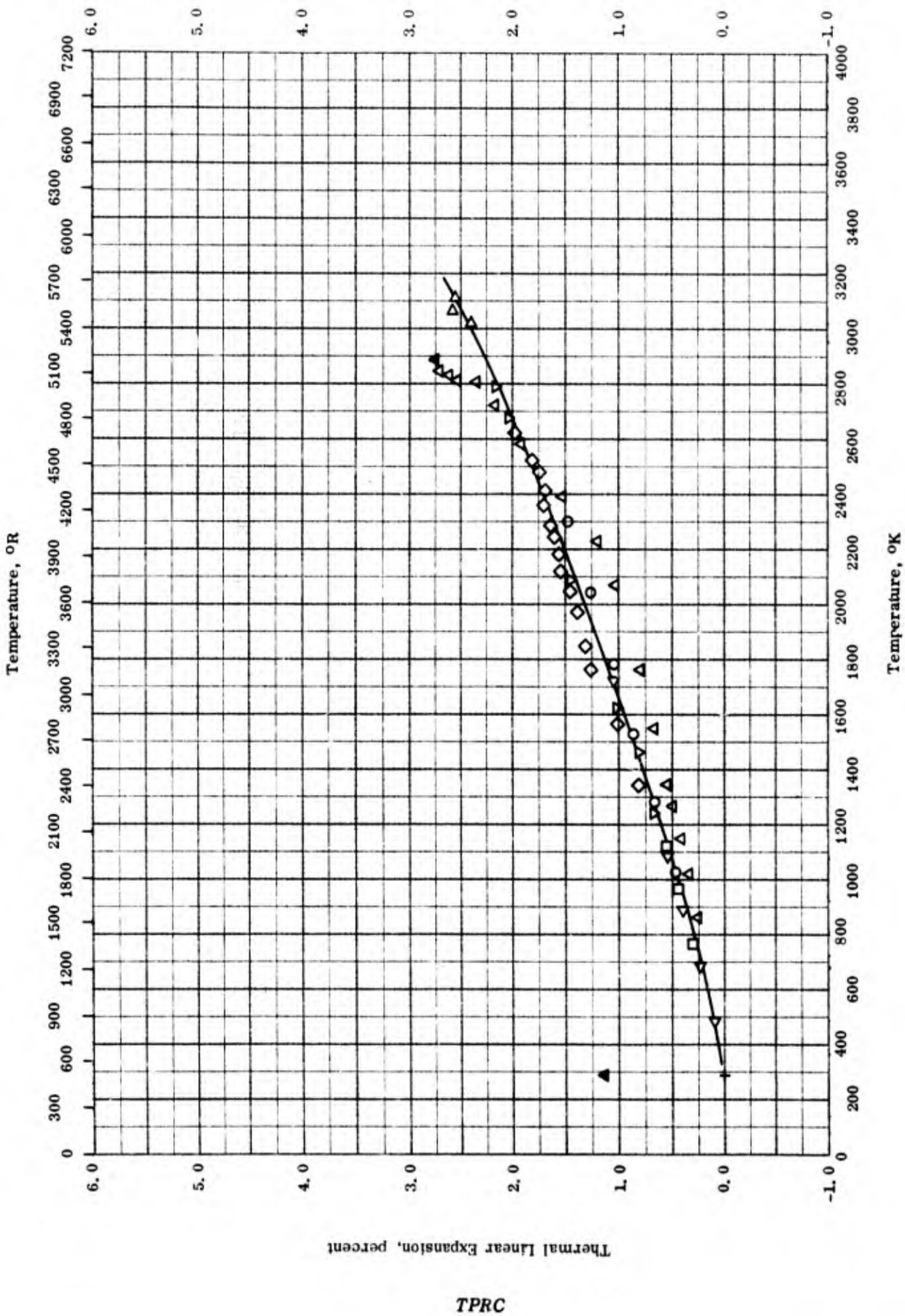

Temperature, °R
0 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 4800 5100 5400 5700 6000 6300 6600 6900 7200
Thermal Conductivity, cal Sec⁻¹ cm⁻¹ K⁻¹
0.14 0.12 0.10 0.08 0.06 0.04 0.02 0.00
Thermal Conductivity, Btu hr⁻¹ ft⁻¹ R⁻¹ x 10⁻²
0.32 0.28 0.24 0.20 0.16 0.12 0.08 0.04 0.00
Heat-soaked at 4500 F (2756 K)
Not heat-soaked.
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 4000
Temperature, °K

TPRC

THERMAL CONDUCTIVITY -- NIOBIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	555-1220	2-4	88.43 Nb, 11.3 C, 0.1 Fe, 0.1 W, 0.07 N, 0.01 > Si, Mn, Mg, Cr, Sn, Ti, Zr, and Ni; approximate composition; density 476 lb ft^{-3}.	Hot-pressed.
△	62-5	1403-2517	2-4	Same as above.	Same as above except heat-soaked at 4500 F; sample found to have cracks and fissures after measurements.
□	62-5	1568-2694	2-4	Same as above.	Same as above.


Thermal Linear Expansion, percent
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
Temperature, °R
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100
5400
5700
6000
6300
6600
6900
7200
Temperature, °K
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- NIOBIUM CARBIDES

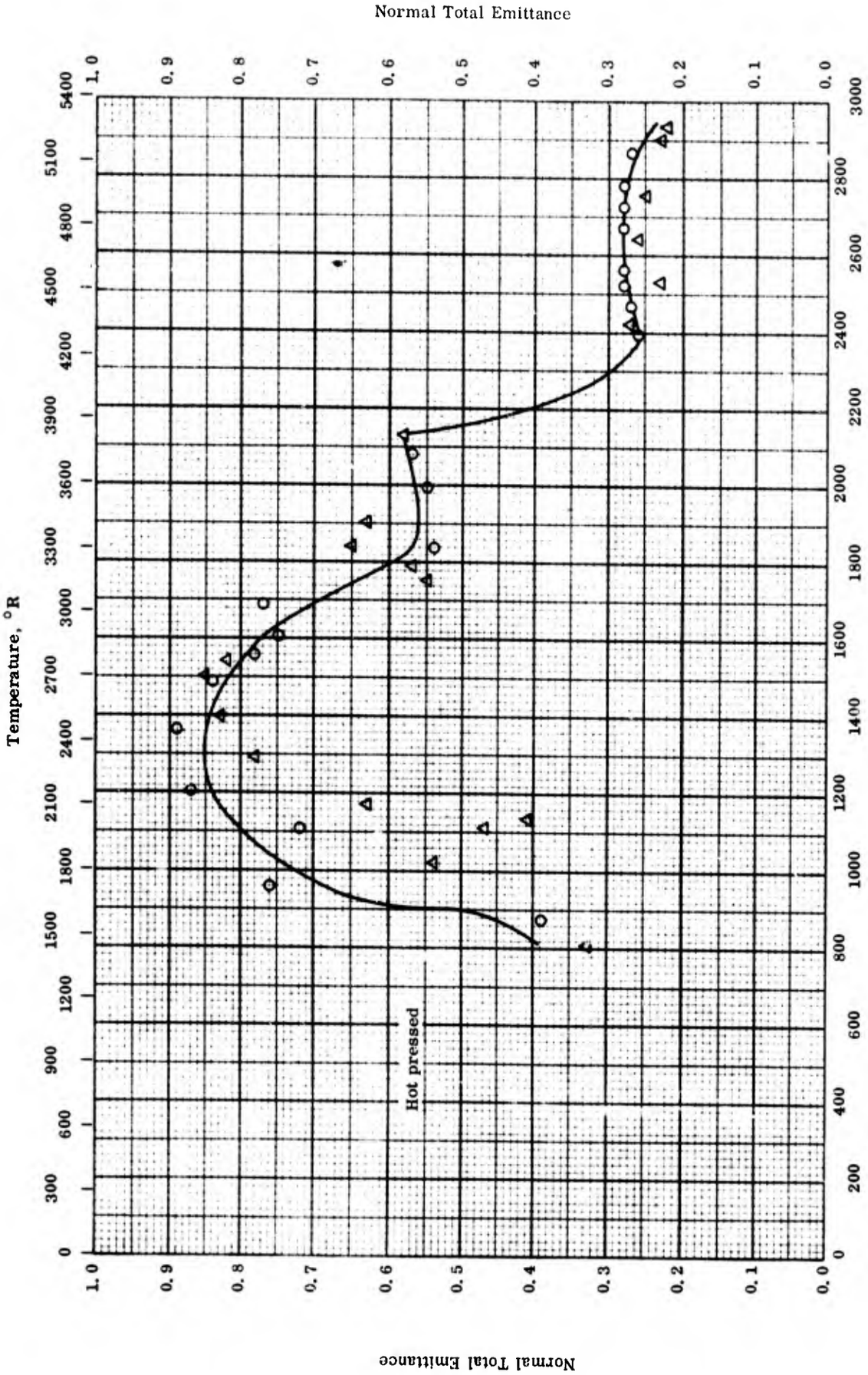
REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-31	298-2304		$NbC_{0.98}$; 88.20 Nb, 11.20 C, 0.08 free carbon, 0.05 B, 0.05 Ta, 0.05 Zr, 0.04 Ti, 0.03 N, 0.02 Cr, 0.02 Cu, and 0.02 O; total impurity 0.36, total analysis 99.68; average particle size of reacted powder approx 7 microns.	Sample prepared from niobium reacted with carbon at 2300 C for 3 hrs, cold pressed at 14000 psi with camphor, and sintered in vacuum at about 1800 C for 2 hrs; x-ray diffraction method, data obtained from (422) and (511/333)
□	58-7	293-1121		$NbC_{0.884}$ from Powder Metallurgy Section, Los Alamos Scientific Lab.; 88.4 Nb and 10.6 C (0.05 free carbon).	X-ray diffraction method.
△	62-5	294-2883	2	NbC from Kennametal, Inc.; before exposure 88.9 Nb, 10.8 C, 0.2 N, 0.1 Fe, and 0.1 other, after exposure 89.1 Nb, 10.7 C, and 0.2 N; density in g cm^{-3} at 25 C by ASTM method B 311 - 58 7.68, after exposure 7.51; initial length 2.9505 in., final length 2.9874 in. [Author's design: Run SRI - E 18]	Hot pressed; measured in helium atm.
▲	62-5	294-2883	2	Same as above.	Cooling data for above sample.
◇	64-15	298-2629		Stoichiometry based on combined carbon $NbC_{1.10}$; 86.36 Nb, 12.88 total C, 0.25 free C, 0.09 Fe and Ta, 0.06 + Ni, 0.24 Cr, 0.02 Pb and Si, 0.015 B, 0.008 Ti, and 0.007 Al; prepared from niobium pentoxide (99.83 Nb_2O_5 from Fansteel Metallurgical Corp.) and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.891 in.; density 7.17 g cm^{-3}, 91.6 % theoretical density. [Author's design: Run 1]	Prepared from Nb_2O_5 reacted with carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot-pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon atm perpendicular to hot-pressing direction.
▽	64-15	298-2798		Same as above. [Author's design: Run 2]	Same as above.

(Continued onto next page)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	64-15	298-3116		Same as above. [Author's design; Run 3]	Same as above.
◁	54-9	273-1723		11.15 total C (cf. theor. 11.45), 0.1-1.0 Ti, 0.01-0.1 each Fe, Zr, 0.001-0.01 each Al, Ca, Cu, Si, and 0.0001-0.001 each Mg, Mn.	X-ray diffraction method.

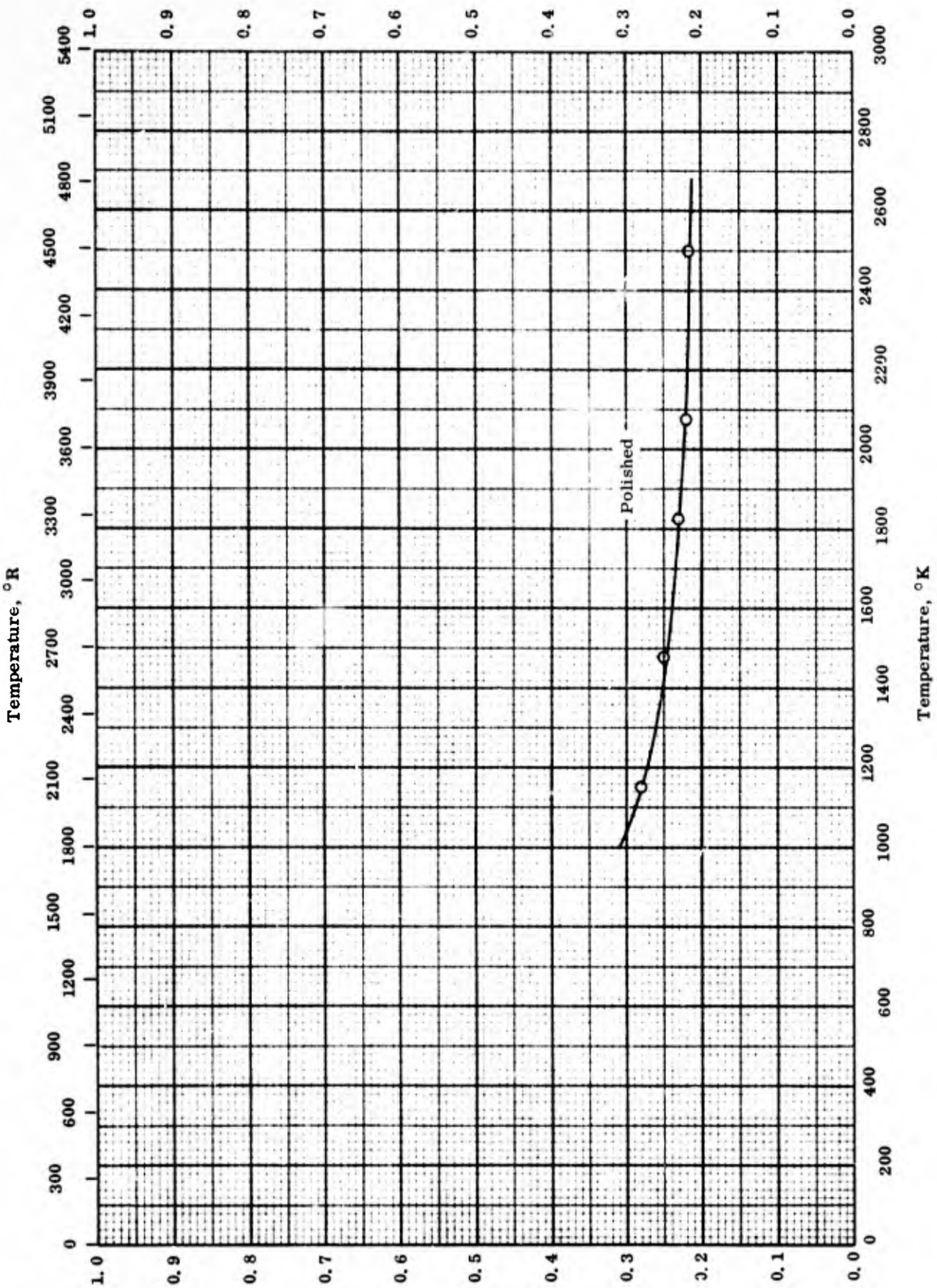


NORMAL TOTAL EMITTANCE -- NIOBIUM CARBIDE

NORMAL TOTAL EMITTANCE -- NIOBIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	874-2866	10	NbC; density 7.75 g cm^{-3}.	Hot-pressed; measured in argon atmosphere; first run.
Δ	62-6	810-2933	10	Same as above.	Same as above; second run.



ANGULAR SPECTRAL EMITTANCE — NIOBIUM CARBIDE

ANGULAR SPECTRAL EMITTANCE -- NIOBIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-14	0.5-0.6	1150-2500		NbC, slice cut parallel to cleavage plane from a single crystal.	Highly polished; measured in argon of 1 atm; 45° from normal.

PROPERTIES OF PLUTONIUM CARBIDES

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density*	12.70	793

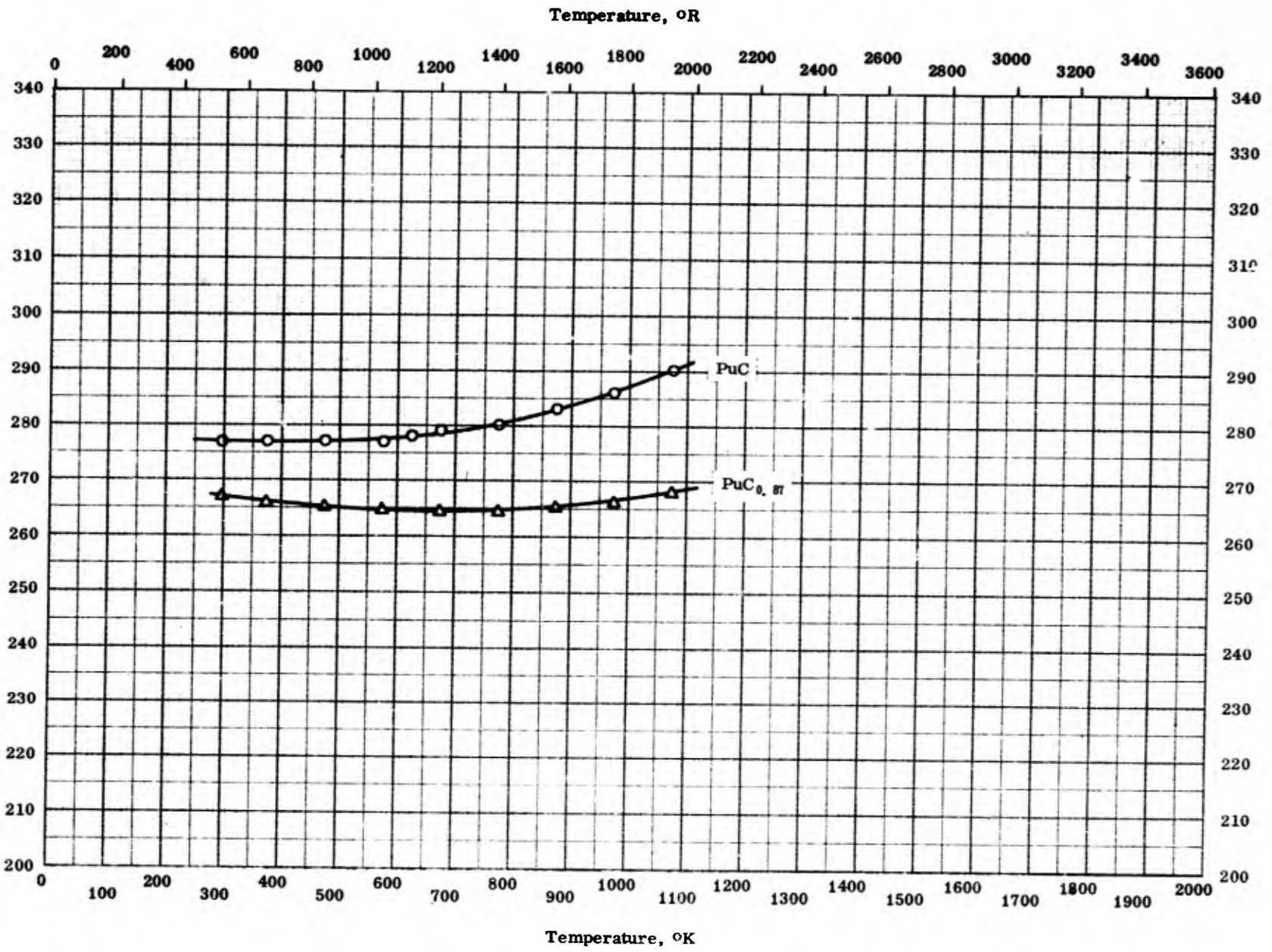
*For Pu_2C_3 only.

REPORTED VALUES

Density	g cm^{-3}	lb ft^{-3}
O Pu_2C_3	12.70	793

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	51-9 also 52-11	298		$Pu_2 C_3$	Computed from x-ray measurement of lattice.

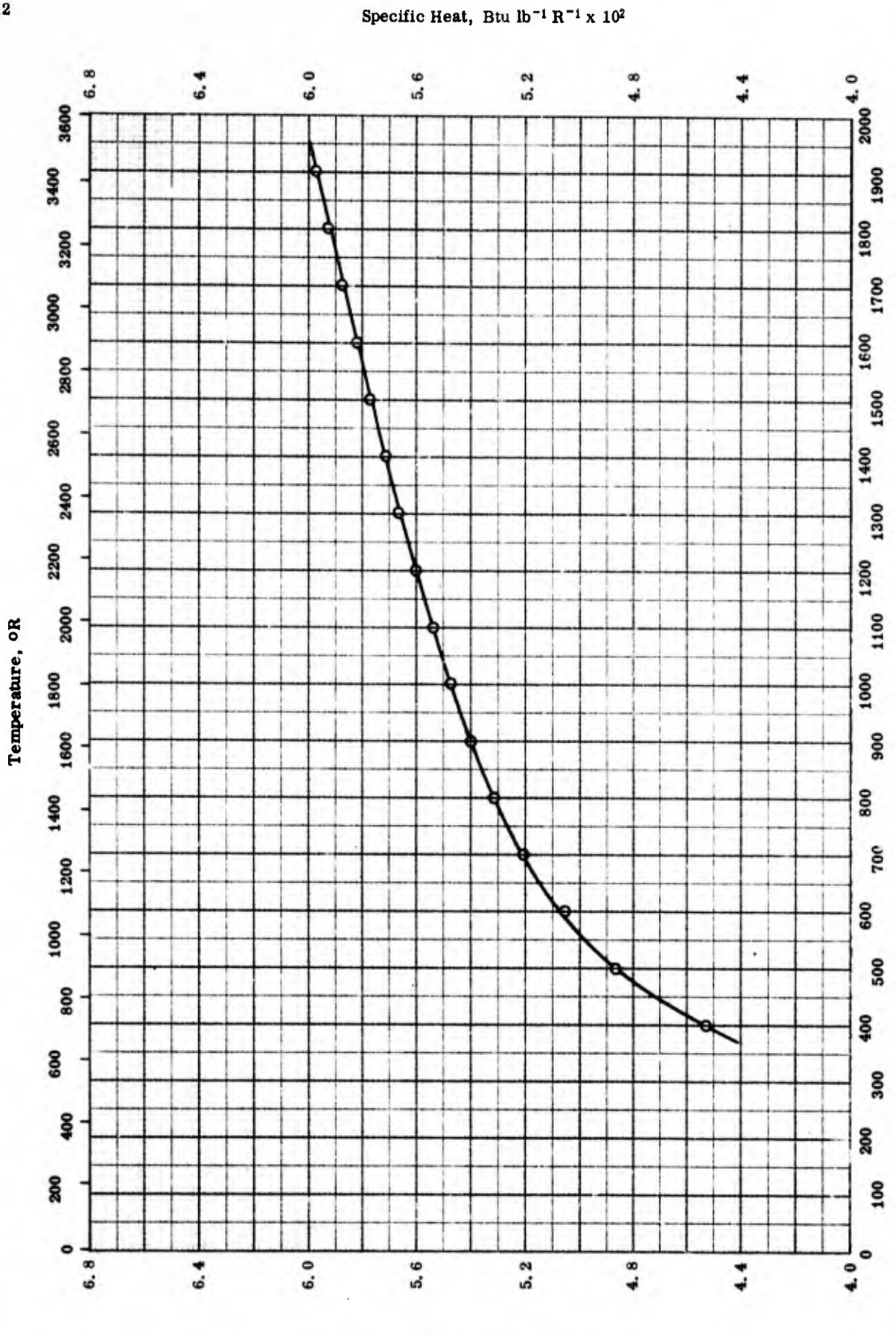


ELECTRICAL RESISTIVITY -- PLUTONIUM CARBIDES

ELECTRICAL RESISTIVITY -- PLUTONIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-4	298-1073		PuC.	
Δ	64-4	298-1073		$PuC_{0.87}$.	

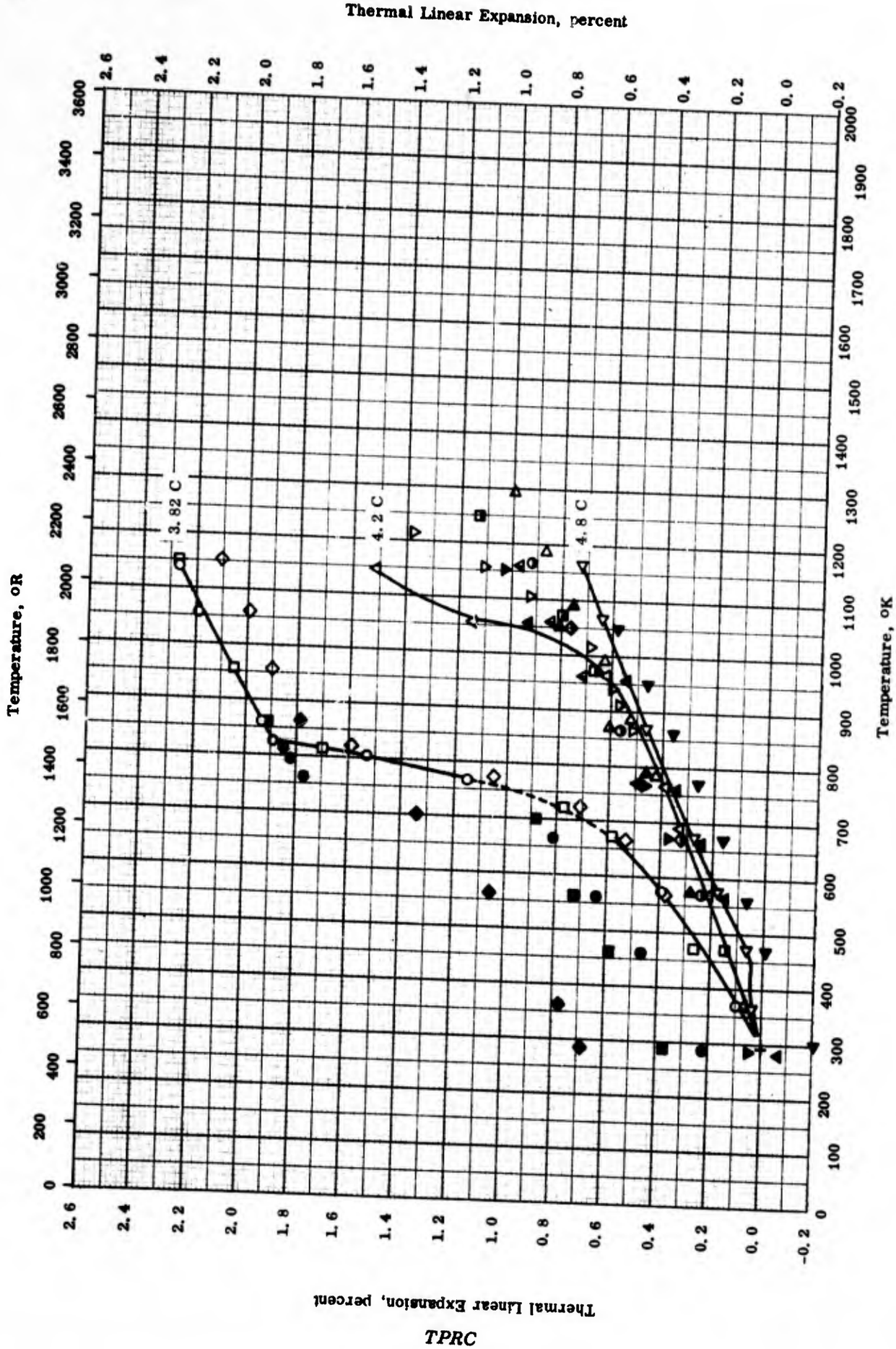


SPECIFIC HEAT -- PLUTONIUM CARBIDE

SPECIFIC HEAT -- PLUTONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-10	400-1900		Pu C; single phase stoichiometric.	



THERMAL LINEAR EXPANSION -- PLUTONIUM MONOCARBIDES

REFERENCE INFORMATION

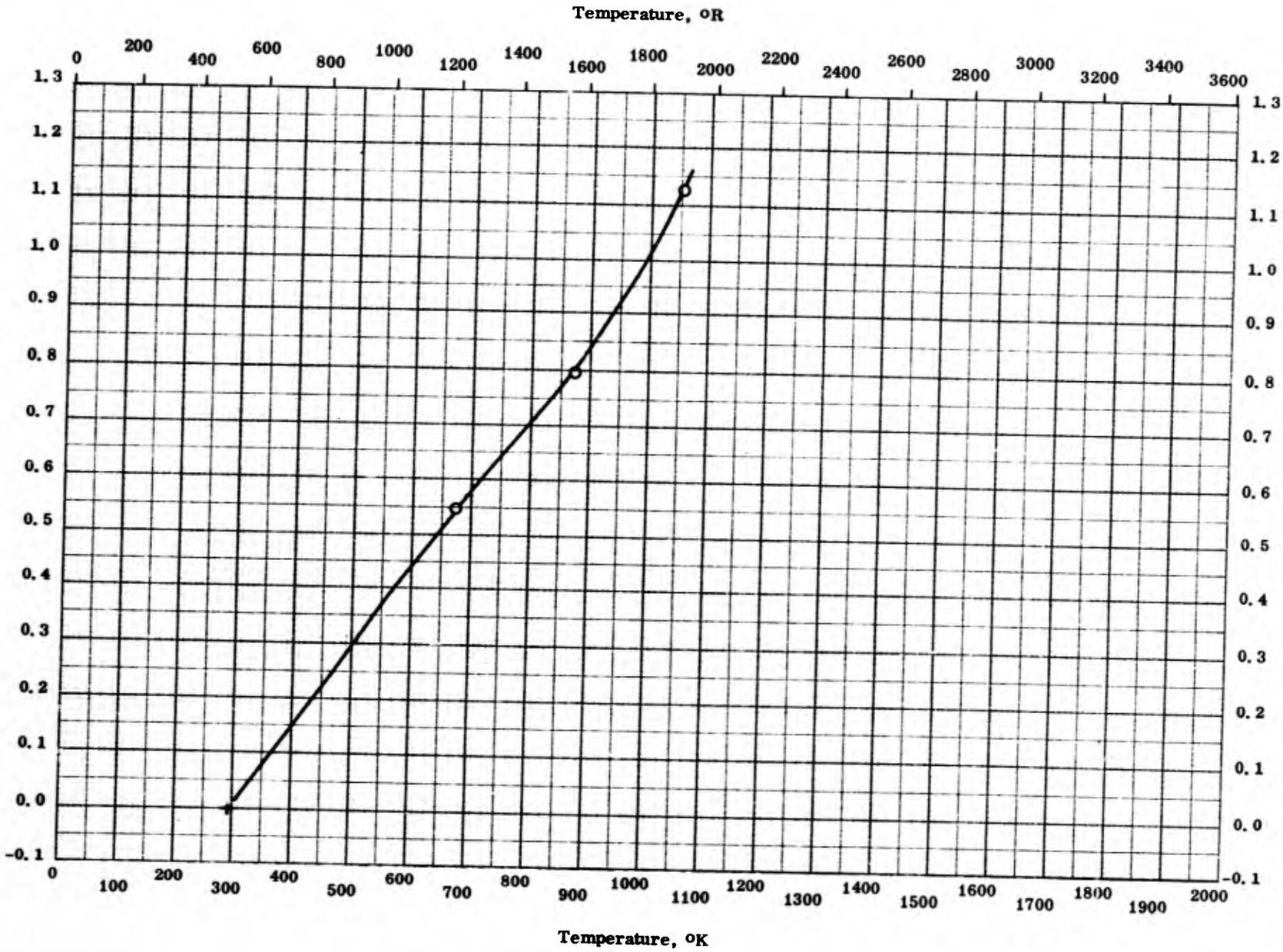
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-21	291-1143		Pu C with 3.82 C; dimensions 1/4 in. diameter by 1 in. long.	Prepared by arc melting pieces of Pu and spectrographically pure C rods in helium atm and drop casting; held at each temperature point for 30 min; measured in helium atm, 10 micron vacuum.
●	60-21	290-1143		Same as above.	Cooling data for above sample.
□	62-39	291-1149		Same as above.	Second heating cycle for above sample; heated to 700 C for several min and slowly cooled before taking measurements.
■	62-39	290-1149		Same as above.	Second cooling cycle for above sample; held overnight at 425 C before cooling.
◇	60-21	293-1153		Same as above.	Fourth heating cycle for above sample.
◆	60-21	289-1153		Same as above.	Fourth cooling cycle for above sample.
△	60-21	288-1148		Pu C with 4.2 C; dimensions 1/4 in. diameter by 1 in. long.	Same as above.
▲	60-21	283-1148		Same as above.	Cooling data for above sample.
▽	60-21	289-1218		Same as above.	Second heating cycle for above sample.
▼	60-21	288-1218		Same as above.	Second cooling cycle for above sample.
▷	60-21	292-1296		Same as above.	Eighth heating cycle for above sample.
▶	60-21	291-1296		Same as above.	Eighth cooling cycle for above sample.
◁	60-21	293-1168		Pu C with 4.8 C; dimensions 1/4 in. diameter by 1 in. long.	Same as above.

(Continued onto next page)

THERMAL LINEAR EXPANSION -- PLUTONIUM MONOCARBIDES (Continued)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◀	60-21	303-1168		Same as above.	Cooling data for above sample.
⬭	60-21	293-1168		Same as above.	Second heating cycle for above sample.
◆	60-21	291-1168		Same as above.	Second cooling cycle for above sample.
■	60-21	291-1250		Same as above.	Seventh heating cycle for above sample.
▲	60-21	291-1250		Same as above.	Seventh cooling cycle for above sample.
▶	62-41	293-1053		PuC; face-centered cubic structure.	Prepared by heating a mixture of plutonium hydride and carbon and crushing the sintered pellet; measured by x-ray diffraction; percent expansion calculated from lattice parameters.



THERMAL LINEAR EXPANSION -- DIPLUTONIUM TRICARBIDE

THERMAL LINEAR EXPANSION — DIPLUTONIUM TRICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-41	298-1053		Pu_2C_3; cubic structure.	Prepared by heating a mixture of plutonium hydride and carbon and crushing the sintered pellet; measured by x-ray diffraction; percent expansion calculated from lattice parameters.

PROPERTIES OF SILICON CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	3.2	200
Melting Point	3100	5580

REPORTED VALUES

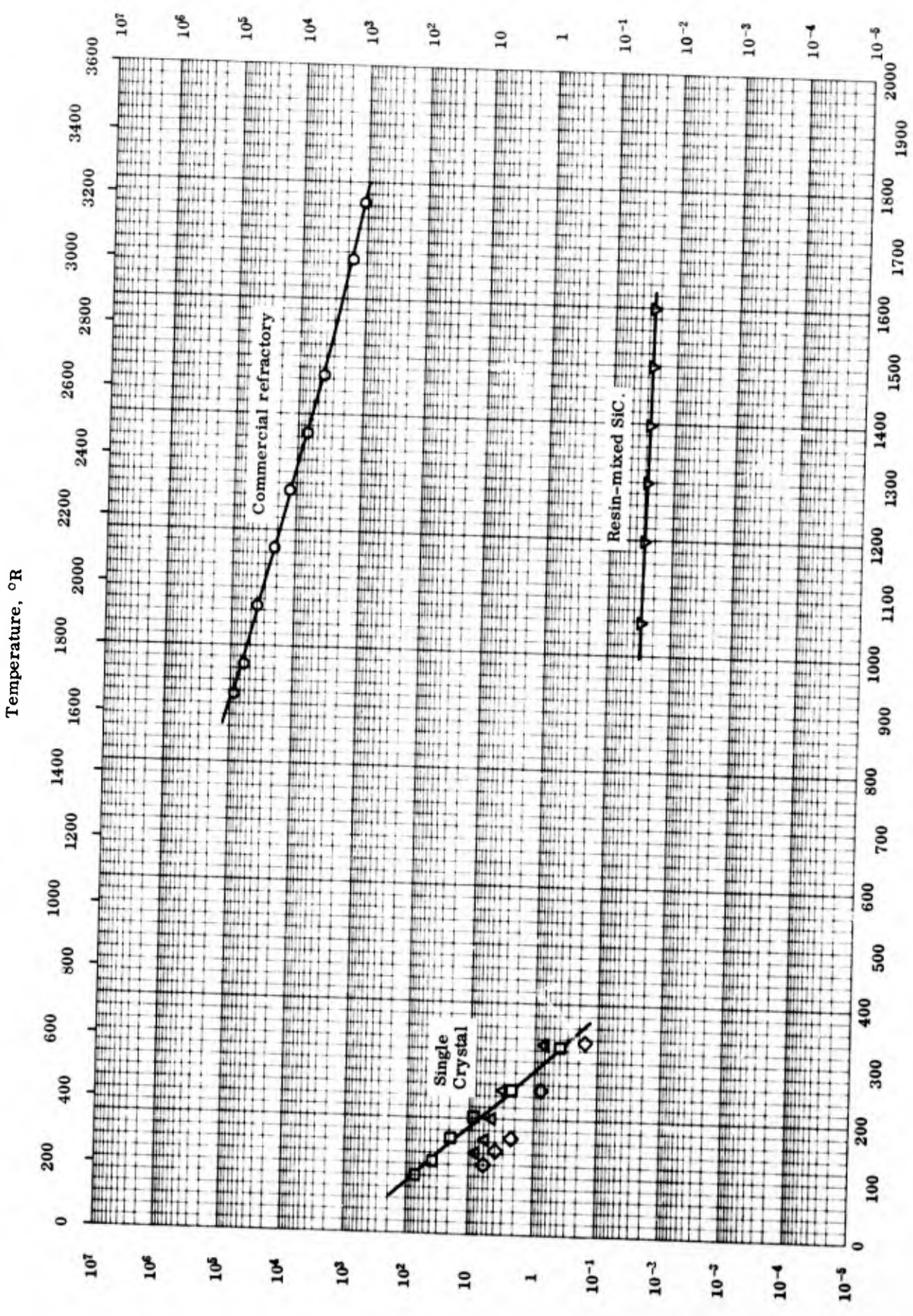
Density	g cm^{-3}	lb ft^{-3}
○	2.96	185
□	2.95	184
△	3.210	200.4
◇	3.208	200.3
▽	3.20	200

Melting Point:	K	R
●	2673	4811
■	3100 ± 40	5580 ± 72
▲	2673	4811

PROPERTIES OF SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-12	298		SiC composed of 25% 1200 mesh 40% 240 mesh, and 35% 100 mesh.	Prepressed at 25,000 psi and hot-pressed at 10,000 psi; heated 10 min to 4645 F.
□	53-12	298		Same as above.	Prepared at 2,500 psi and hot-pressed at 10,000 psi; heated 15 min to 4600 F.
△	50-12	298		β-SiC; cubic form.	Density computed from x-ray measurements of lattice.
◇	50-12	298		β- SiC; hexagonal form.	Same as above.
▽	60-22	298		SiC	
●	62-46	2673		SiC.	
■	60-26	3060-3140		SiC.	
▲	60-8	2673		SiC.	

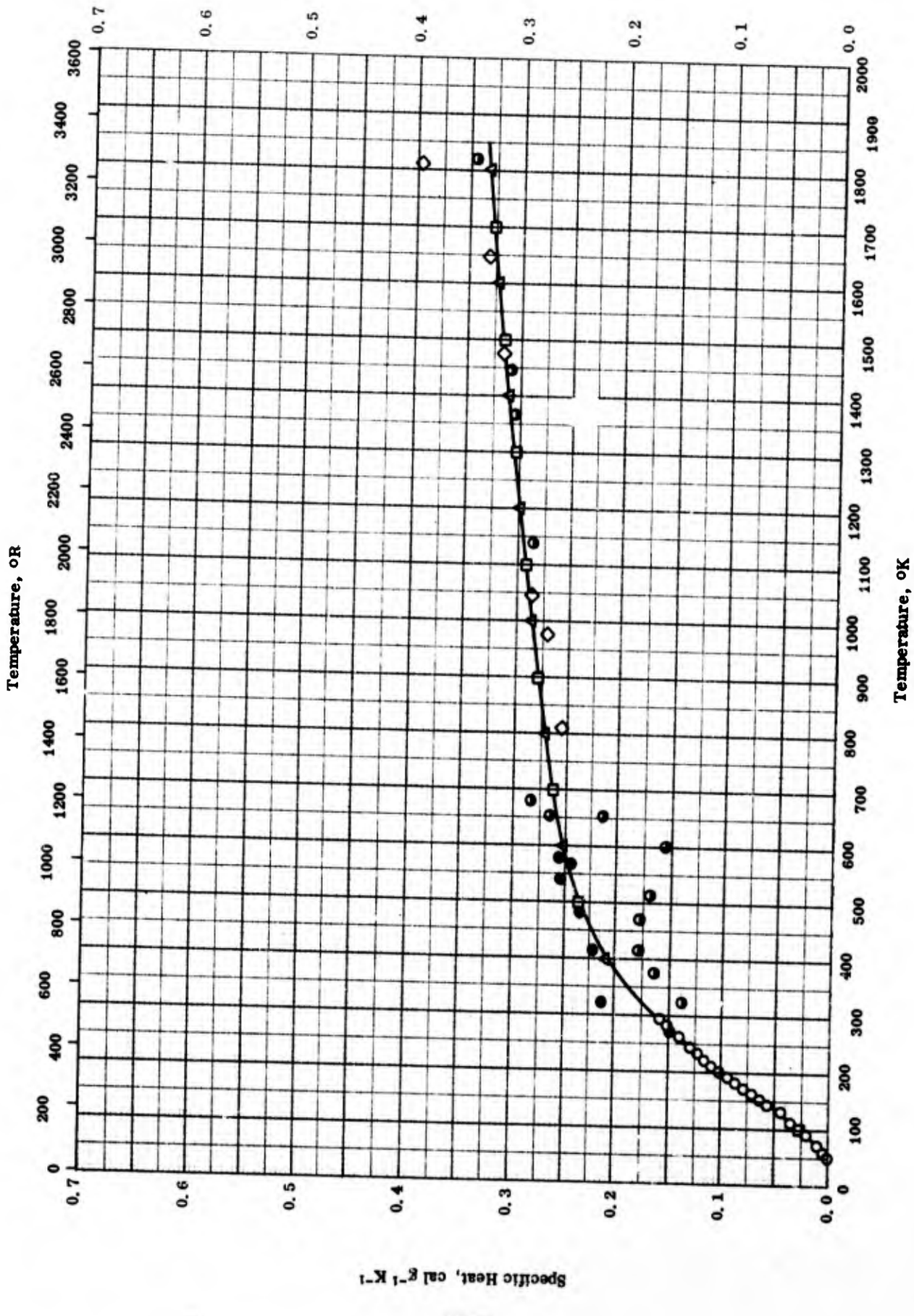


ELECTRICAL RESISTIVITY -- SILICON CARBIDE

ELECTRICAL RESISTIVITY -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-8	923-1773		Commercial refractory; comp. not given; apparent porosity 12%.	
□	52-2	100-333		Cut from single crystal.	Black sample No. 1.
△	52-2	100-333		Same as above.	Green sample.
◇	52-2	100-333		Same as above.	Black sample No. 2.
▽	60-6	1060-1600		Resin-mixed SiC; raw materials micropulverized and thoroughly blended; sample highly homogeneous.	

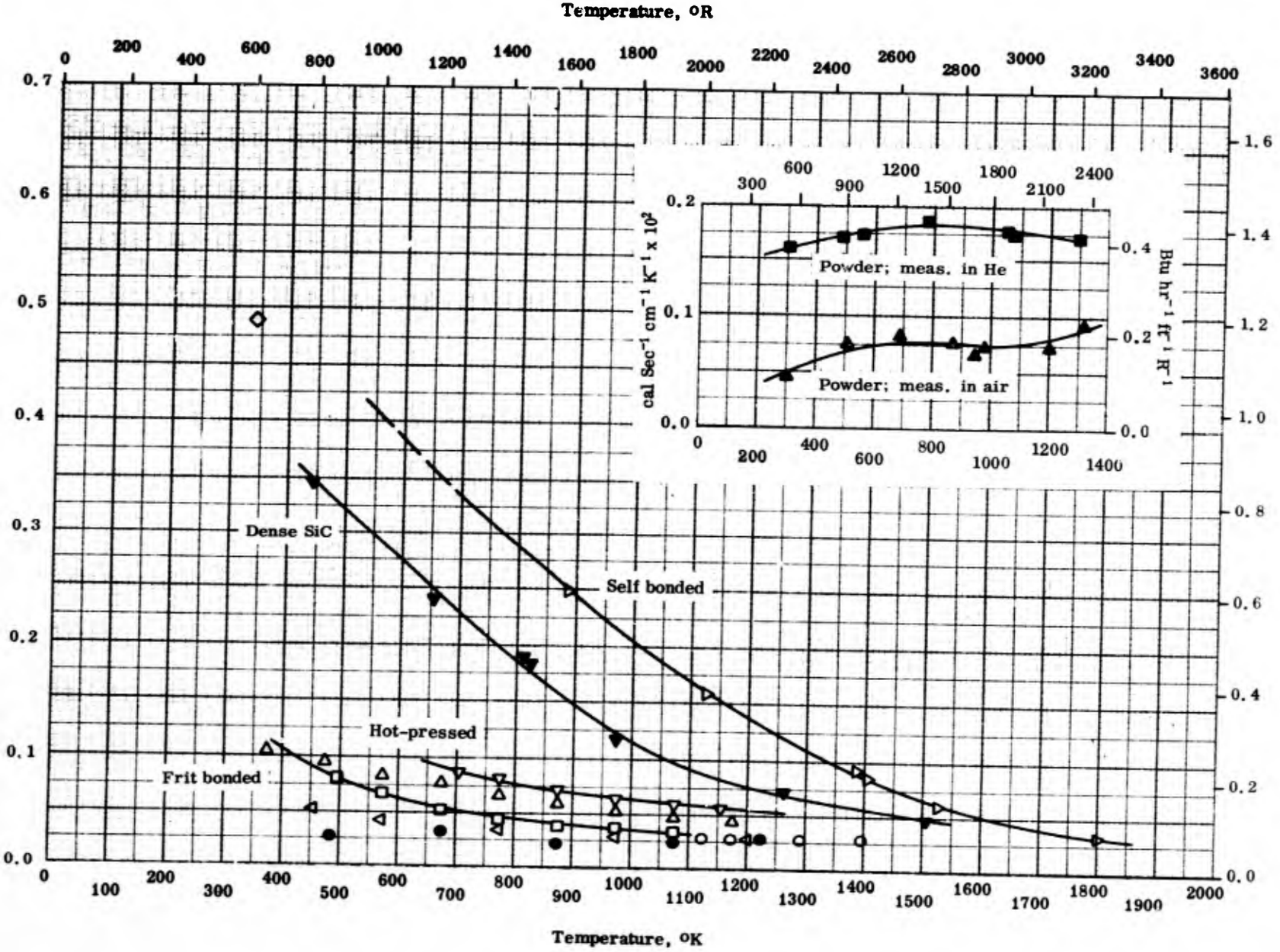


SPECIFIC HEAT -- SILICON CARBIDE

SPECIFIC HEAT -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	51-6	54-295	0.5	99 Si C and 0.6 Si O_2.	Corrected for Si O_2 impurities.
□	52-4	54-1800		Hexagonal Si C; 99.73 Si C, 69.84 Si, 29.89 C, 0.18 Fe, 0.08 Al and 0.01 > Ca.	
△	52-4	54-1800		Cubic Si C; 1.0 > Hexagonal Si C, 0.34 free C, 0.17 Si O_2, 0.06 Al, 0.013 Si, and 0.004 Fe.	
◇	58-3	810-1810	3.0	Si C; before test: 67.46 Si, 28.58 C, 0.73 Al, 0.58 Fe, 0.48 Ca O; after test: 68.12 Si, 27.29 C, 1.47 Al, 0.44 CaO, 0.32 Fe; density 51[illegible].2 lb ft^3.	Under helium atmosphere.
◒	50-5	323-723		Si C; powdered sample.	Under coal gas atmosphere.
●	55-8	353-673	±8.0	Exolon type, common black variety; powder between 40 and 60 mesh.	

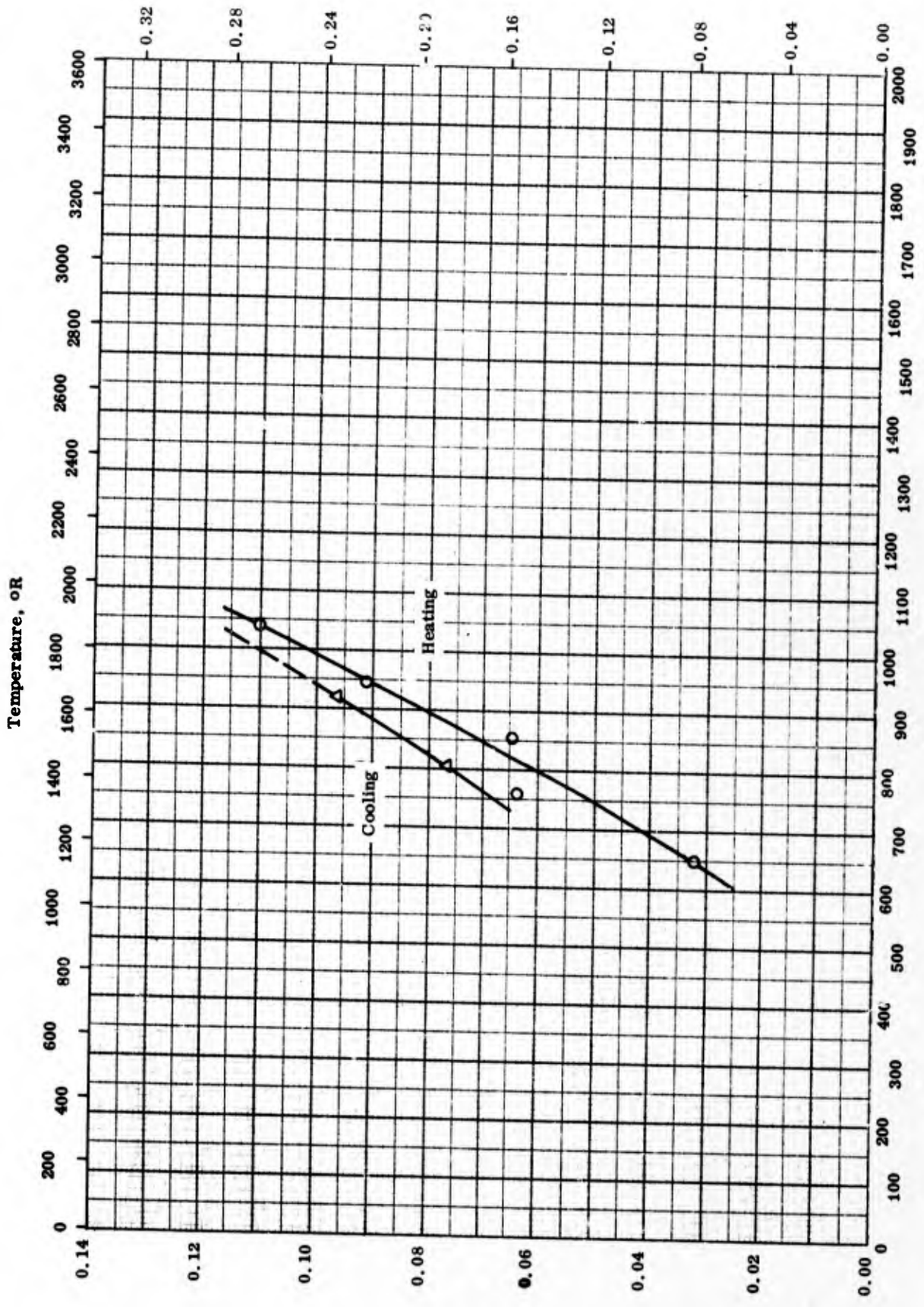


THERMAL CONDUCTIVITY -- SILICON CARBIDE

THERMAL CONDUCTIVITY -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-8	1123-1398	± 5	Silicon carbide brick; 1.71 Al_2O_3; SiO_2, TiO_2, Fe_2O_3, CaO, MgO, K_2O, Na_2O not detected; density 157 lb ft^{-3}; apparent porosity 17.8%.	
□	55-5	493-1073		Commercial frit bonded.	
△	54-3	373-1173		Cut from ingot.	Test in vacuum.
▽	55-5	703-1153		Hot pressed.	
▷	58-3	889-1801		Self bonded; composition before test: 67.46 Si, 28.58 C, 0.73 Al, 0.58 Fe, 0.48 CaO; after test: 68.12 Si, 27.29 C, 1.47 Al, 0.32 Fe, 0.44 CaO; density 193 lb ft^{-3}.	Tested in He atmos.
◇	53-5	343		Polycrystalline; density 175 lb ft^{-3}.	Tested in vacuum.
◁	54-5	453-1200		SiC frit bonded; commercial sample.	
●	54-5	483-1223		Same as above.	
■	59-4	309-1302		320 B mesh SiC powder; density 99 lb ft^{-3}.	Measured in He at atm pressure.
▲	59-4	305-1320		Same as above.	Measured in air at atm pressure.
▼	61-3	444-1505		Dense SiC.	

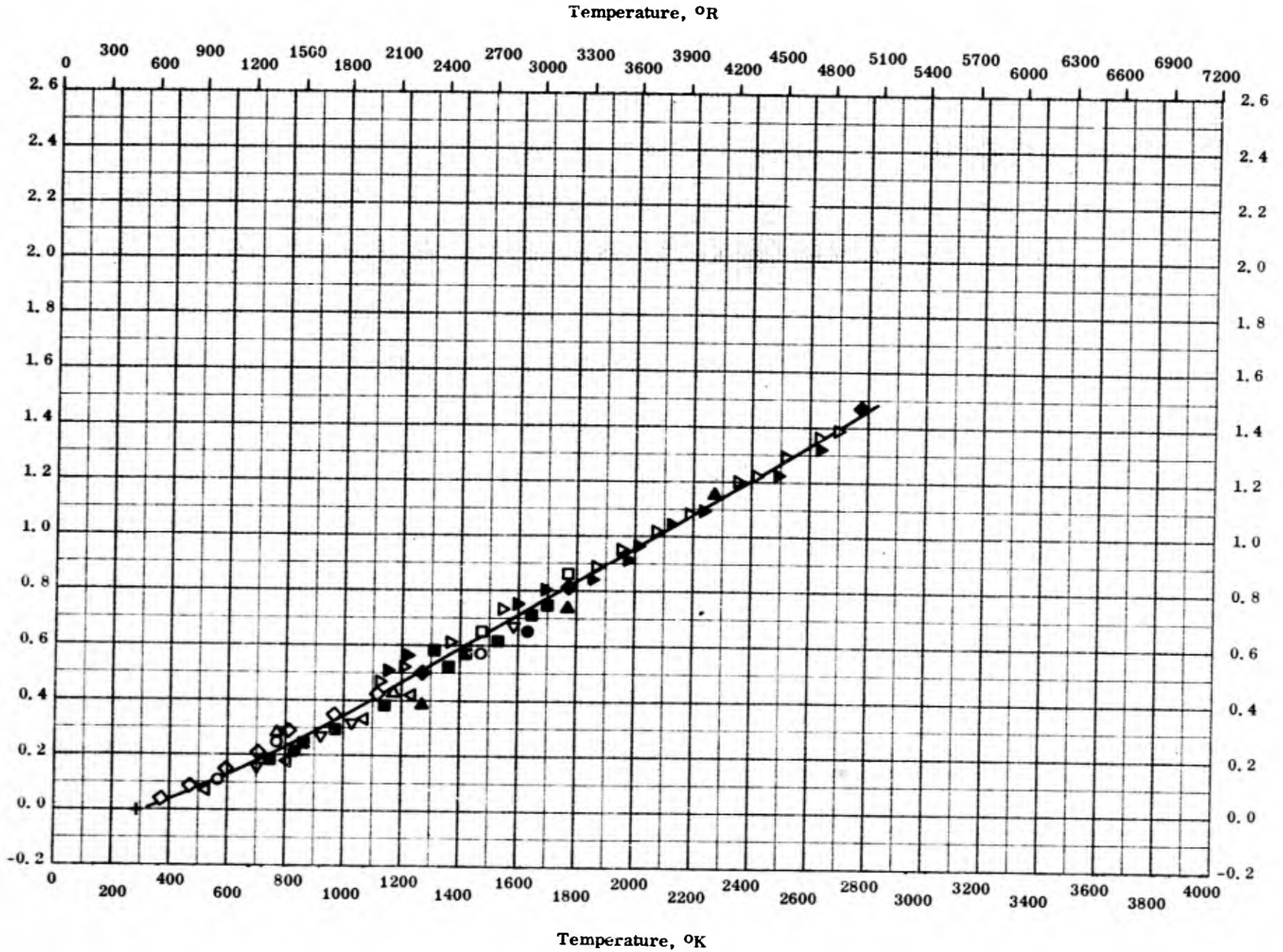


THERMAL CONDUCTIVITY -- SILICON CARBIDE FOAM

THERMAL CONDUCTIVITY -- SILICON CARBIDE FOAM

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-7	650-1039		Density 29 lb ft^{-3}.	Measured in 4×10^{-7} to 3×10^{-4} mm Hg pressure range.
Δ	63-7	850-922		Same as above.	The above sample measured cooling.

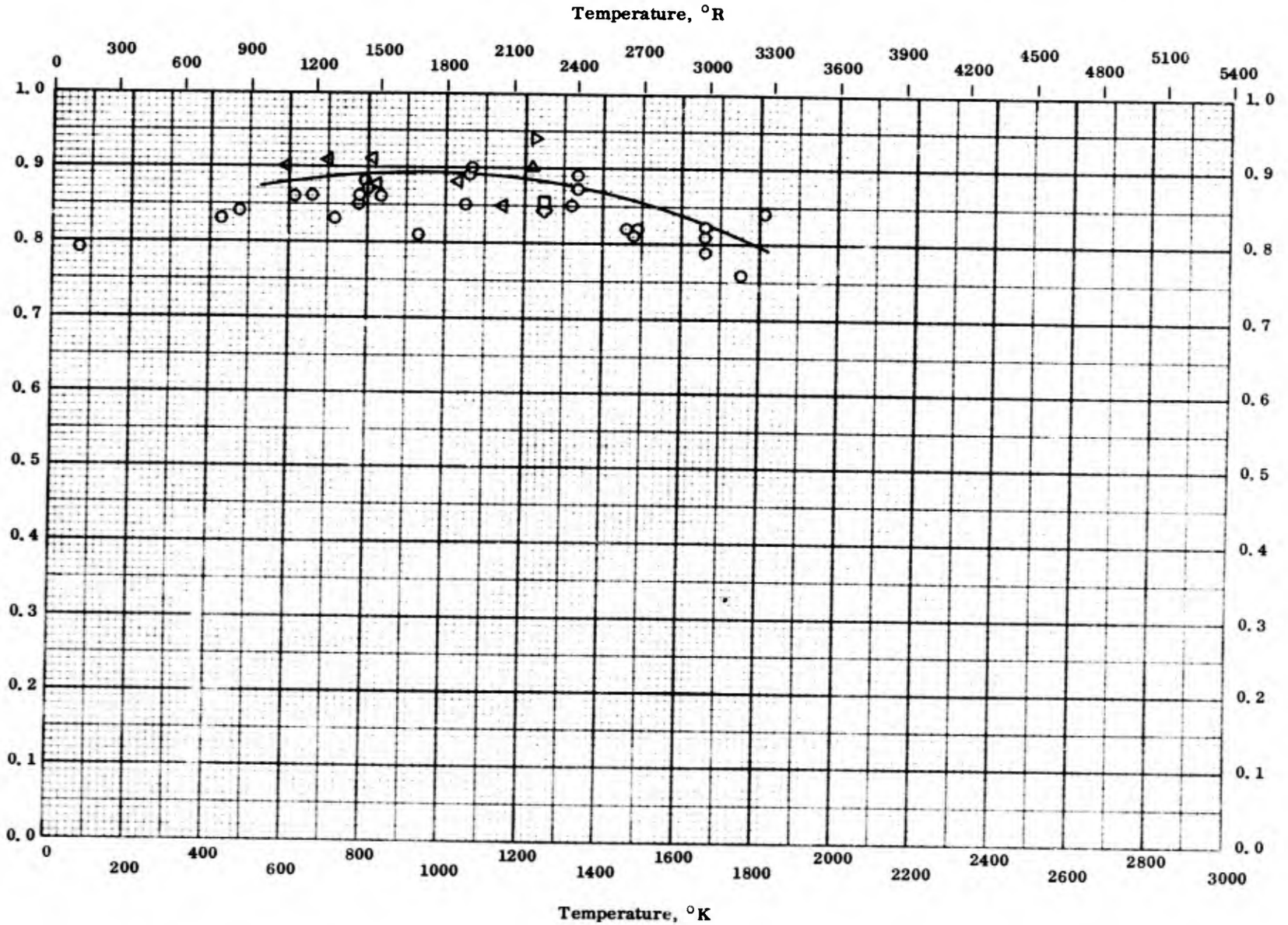


THERMAL LINEAR EXPANSION -- SILICON CARBIDE

THERMAL LINEAR EXPANSION — SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◁	62-38	300-1231		SiC Foam, Carborundum Co., Niagara Falls, N. Y.; density 38 lb ft^{-3}; dimensions 1/2 in. diameter by 3 in. long.	Measured in vacuum of 1/2 in. Hg up to 1700 F and with a slight purge of argon above 1700 F.
●	61-3	300-1636		Dense silicon carbide; dimensions 3 in. long by 0.5 in. diameter.	
■	57-20	293-1700		Sample obtained from Carborundum Co. in 1956; 8-9 free silicon; density 3.0 g cm^{-3}; grain size 0.002-0.003 in. and 0.006-0.008 in.	Measured in vacuum of the order of 10^{-6} to 10^{-5} mm Hg and at a heating rate of about 3-5 F min^{-1}.
◆	60-23	298-2773			
▲	63-29	293-2273		SiC.	Measured in inert atm with pressure of approx 1 in. water above atm pressure.
▷	58-8	301-2697		Density 2.50 g cm^{-3}. [Author's design; Sample No. BP-F2]	Hot pressed; measured in argon atm.
▶	58-8	1157-2697		Same as above.	Cooling data for above sample.
○	56-7	573-1773		Silicon carbide.	Recrystallized.
△	56-7	573-1773		Silicon carbide.	Clay-bonded.
□	56-7	573-1773		Silicon carbide.	Bonded glazed brick.
◇	58-3	300-1880		Before test 67.46 Si, 28.58 C, 0.73 Al, 0.58 Fe and 0.48 CaO; after test 68.12 Si, 27.29 C, 1.47 Al, 0.32 Fe, and 0.44 CaO.	
▽	57-20	700-1700		Silicon carbide.	Measured in vacuum of 10^{-6} to 10^{-5} mm Hg.

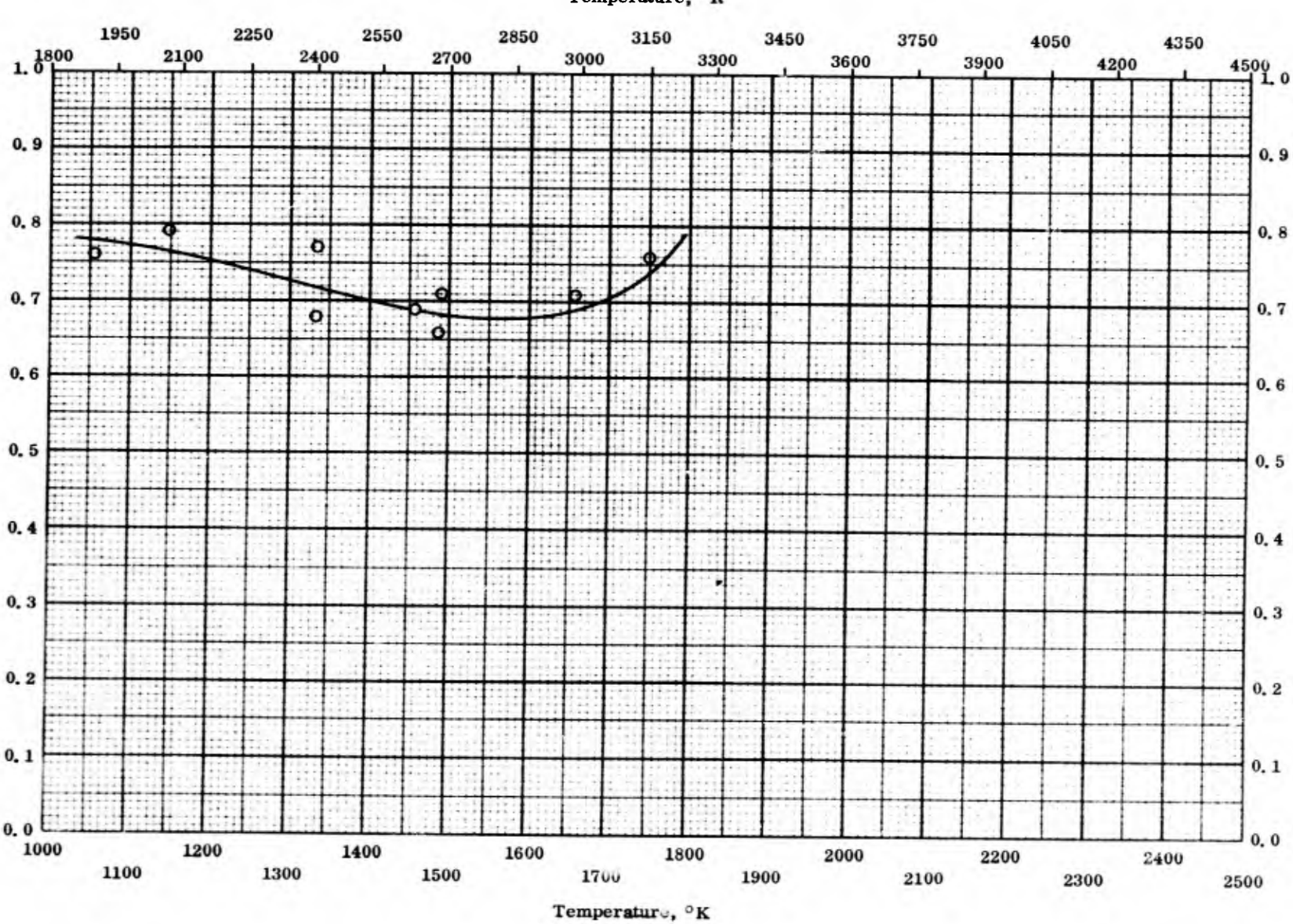


NORMAL TOTAL EMITTANCE -- SILICON CARBIDE

NORMAL TOTAL EMITTANCE -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	62-25	1255		SiC from Norton, crystolon - R.	Ground and polished; cleansing with alcohol and distilled water; heated in air at 1255 K for 3 min.
▽	62-25	1255		Same as above.	Same as above except for 11 min.
◇	62-25	1255		Same as above.	Same as above except for 23.5 min.
◁	62-25	539-1255		Same as above.	Same as above except preoxidized in air at 1255 K for 25 min.
▷	63-18	1223	±8	SiC from Carborundum; density 2.32 g cm^{-3} 0.053 in. thickness.	
△	63-18	1223	±8	SiC; density 1.49 g cm^{-3}.	Sintered at 2173 K for 1 hr; computed from spectral data.
○	59-8	75-1811		SiC.	Measured in air.

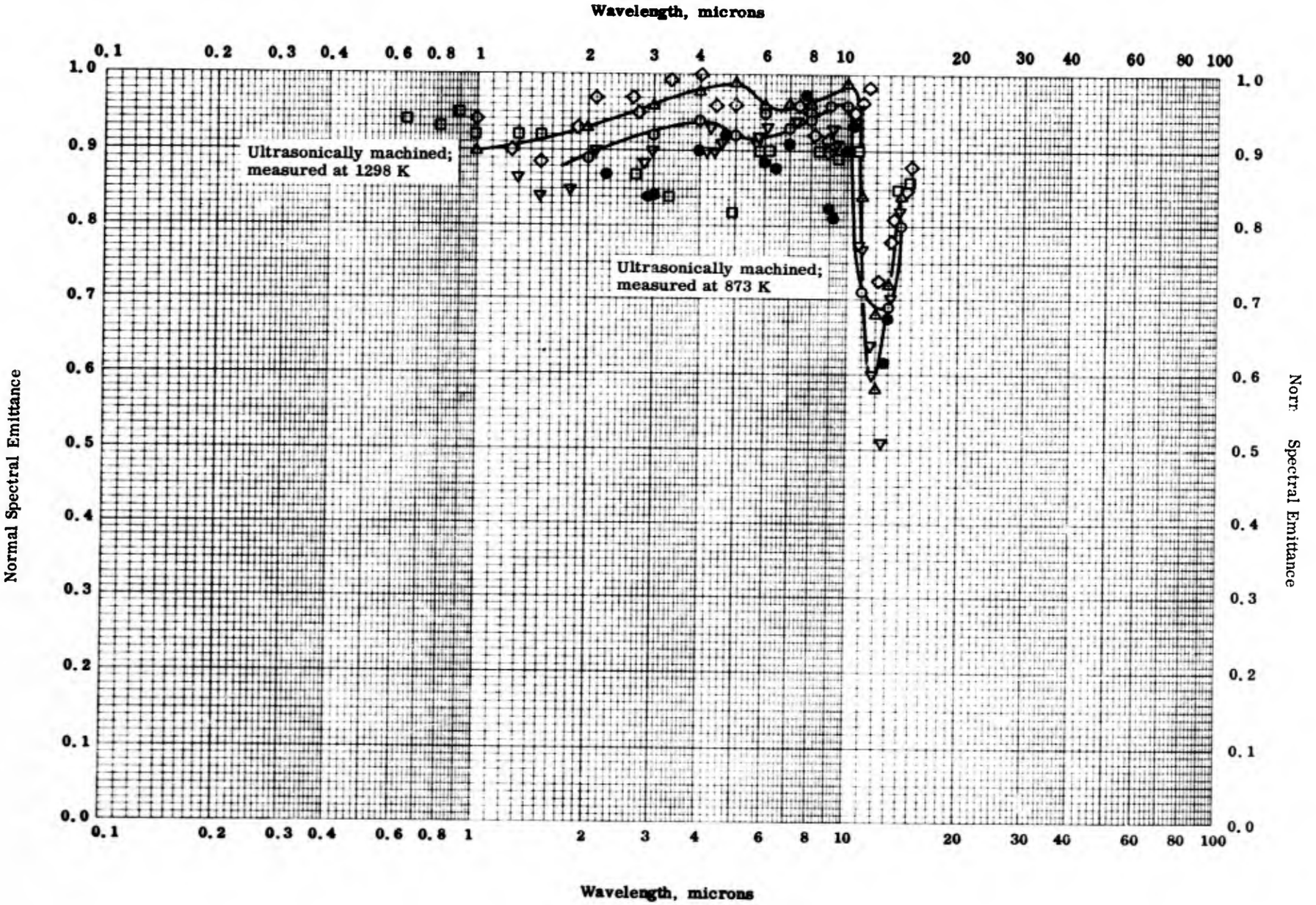


NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE

NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	59-8	0.665	1055-1750		SiC.	Measured in air.

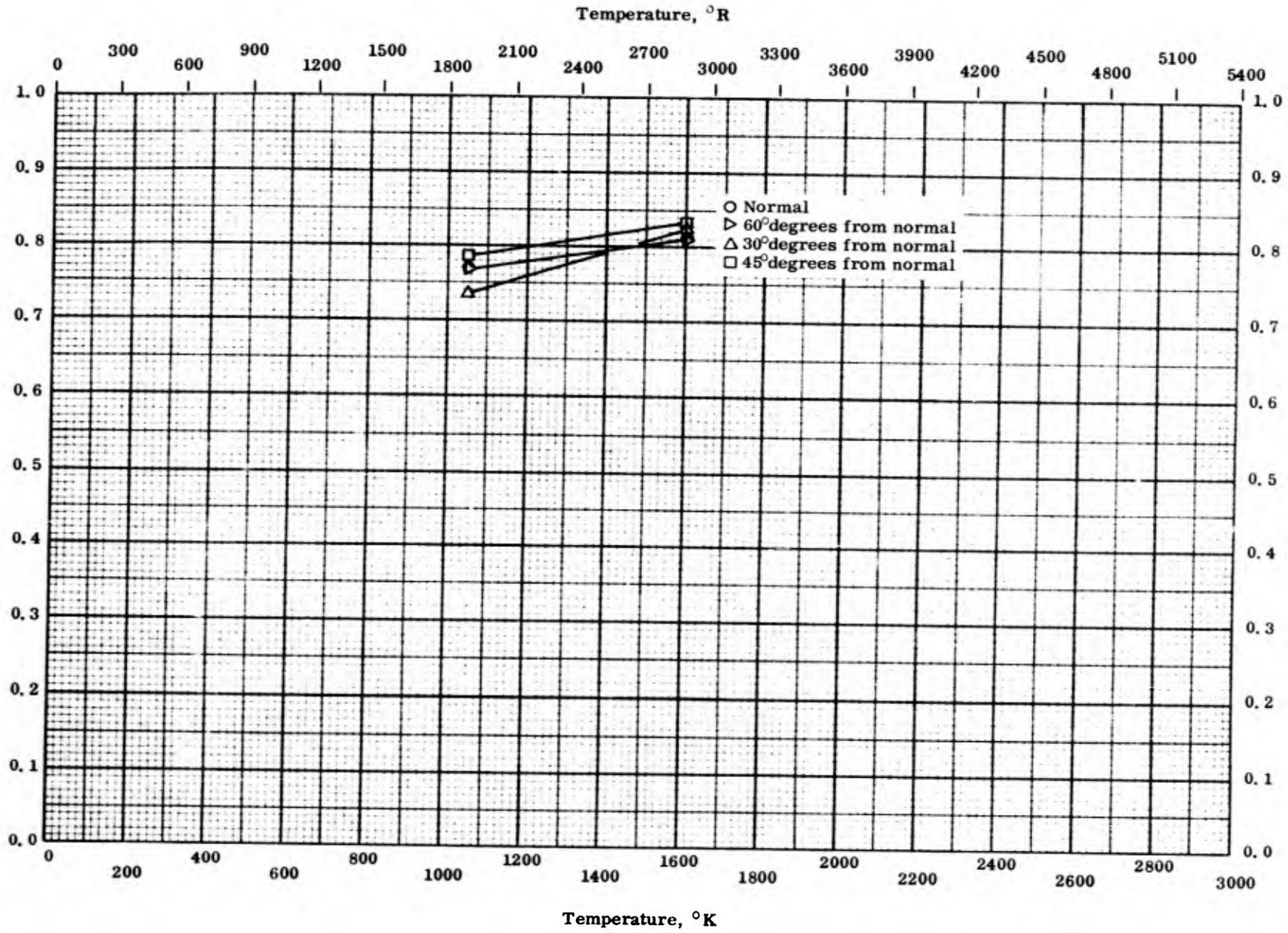


NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE

NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. ° K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	60-15	873	2-14	4	SiC, 99 pure.	Ultrasonically machined; measured in air.
△	60-15	1298	1-14	4	Same as above.	Same as above.
□	62-24	1358	0.65-14.9		Globar.	
◇	63-18	1223	1-15		SiC from Carborundum Co.; density 2.32 g cm^{-3}.	Measured in argon; data taken from a curve.
▽	63-18	1223	1-15		SiC; density 1.49 g cm^{-3}.	Sintered at 2173 K for 1 hr; measured in argon; data taken from a curve.
●	60-13	1296	2.25-14		SiC from Norton, crystolon R.	Flat smooth surface, preoxidized by heating in air at 1400 K for 1 hr; measured in 90 Ar + 10 H_2; data taken from smooth curve.



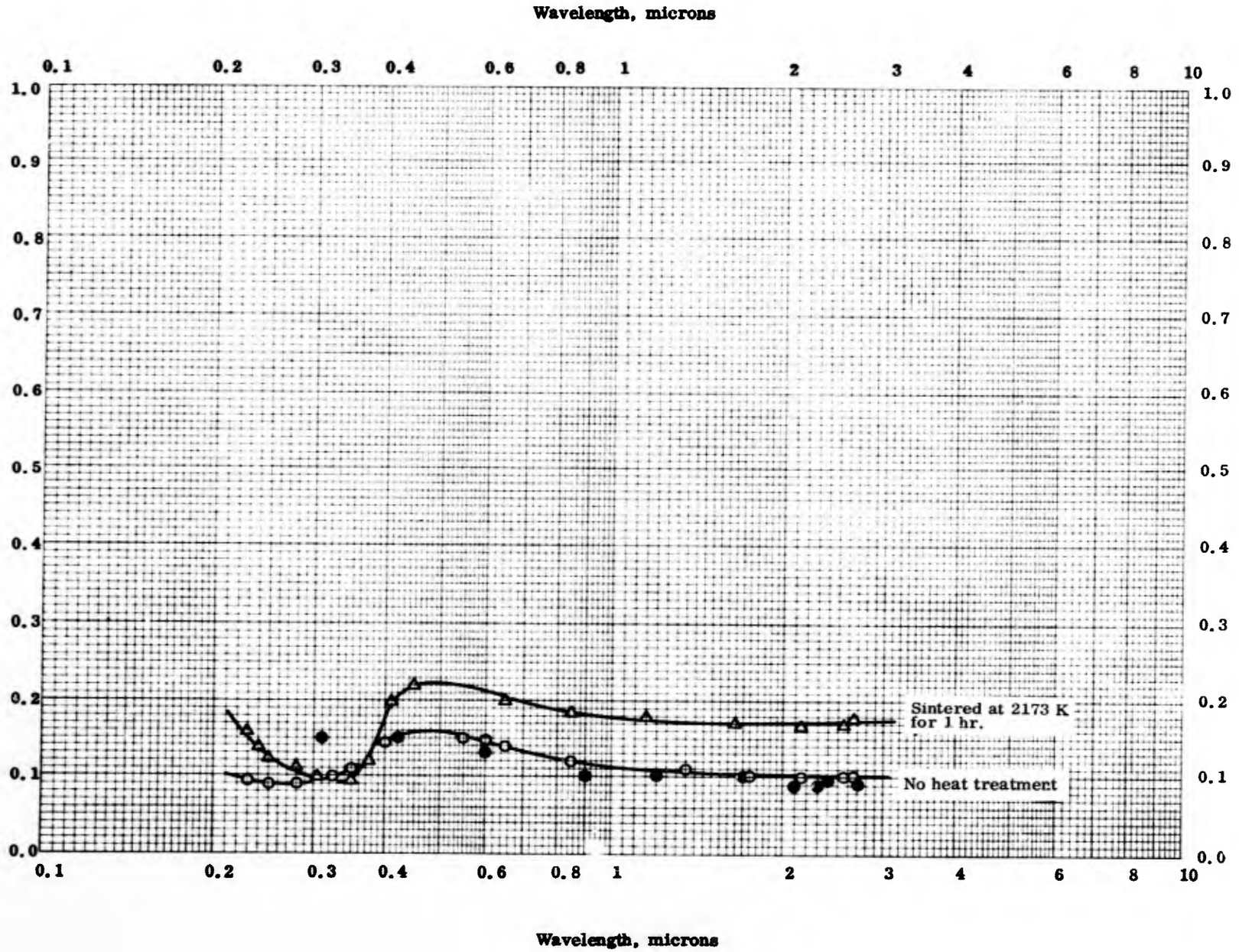
TPRC

ANGULAR TOTAL EMITTANCE -- SILICON CARBIDE

ANGULAR TOTAL EMITTANCE -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-13	1050-1600		SiC.	Normal to specimen.
△	60-13	1050-1600		Same as above.	30°degrees from normal.
□	60-13	1050-1600		Same as above.	45°degrees from normal.
▷	60-13	1050-1600		Same as above.	60°degrees from normal.



NORMAL SPECTRAL REFLECTANCE -- SILICON CARBIDE

NORMAL SPECTRAL REFLECTANCE -- SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
●	59-8	298	0.31-2.7	4	SiC.	Measured in air; data taken from smooth curve; 9° incidence; $MgCO_3$ as reference standard.
○	63-18	298	0.23-2.65	5	SiC from Carborundum Co.; density 2.32 g cm^{-3}.	Data taken from a curve; MgO as reference standard; normal incidence, hemispherical viewing.
△	63-18	298	0.23-2.65	5	SiC; density 1.49 g cm^{-3}.	Sintered at 2173 K for 1 hr; same as above.

PROPERTIES OF TANTALUM CARBIDES

REPORTED VALUES

Density	g cm^{-1}	lb ft^{-3}
□ TaC	14.37*	897.0*
◇ TaC	13.88	866

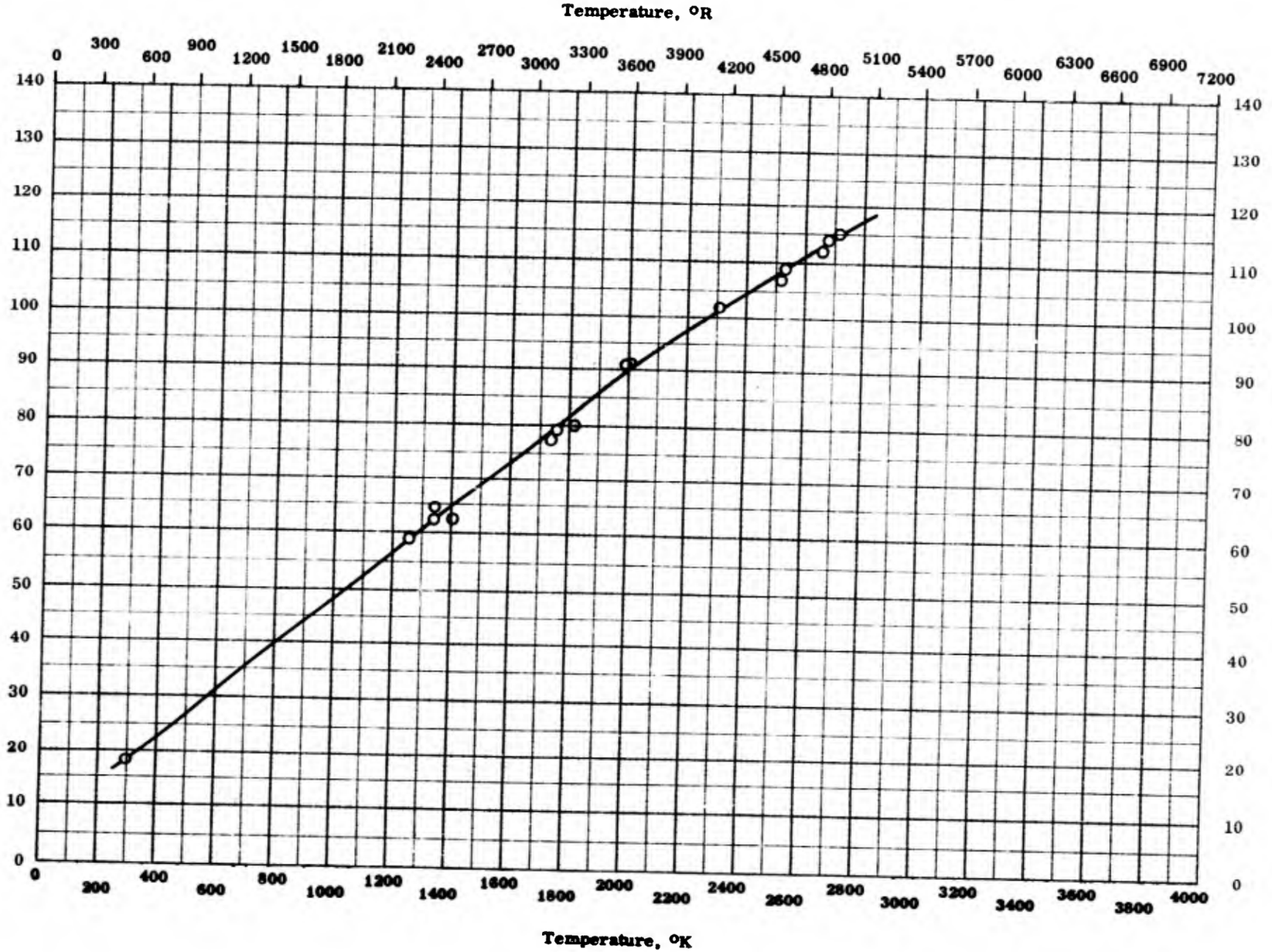
Melting Point	K	R
○ TaC	3813	6863
△ TaC	4127 ± 24*	7428± 43*
● TaC	4148	7466
■ TaC	3813 ± 15	6863 ± 27
▲ TaC	4155.6	7480
▼ Ta_2C	3673	6611

*Most probable value for this compound.

PROPERTIES OF TANTALUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-13	3813		TaC; α - phase.	Arc-melted; M.P. from calibrated optical pyrometer sighting on liquid-solid interface.
□	56-12	298		TaC.	Density computed from x-ray measurement of lattice.
△	56-11	4103-4151		TaC.	
◇	62-5	298		6.14 C, 0.1 W, and 0.01> Si, Mg, Ca, Al, Ti, Nb, Sn, Zr, Fe, Na, Mn, Mg, and Ni.	Hot-pressed; max. exposure temperature 4800 F.
●	62-46	4148		TaC	
■	61-22	3798-3828		TaC	Average of 4 samples.
▲	60-8	4155.6		TaC	
▼	43-3	3673		Ta_2C	

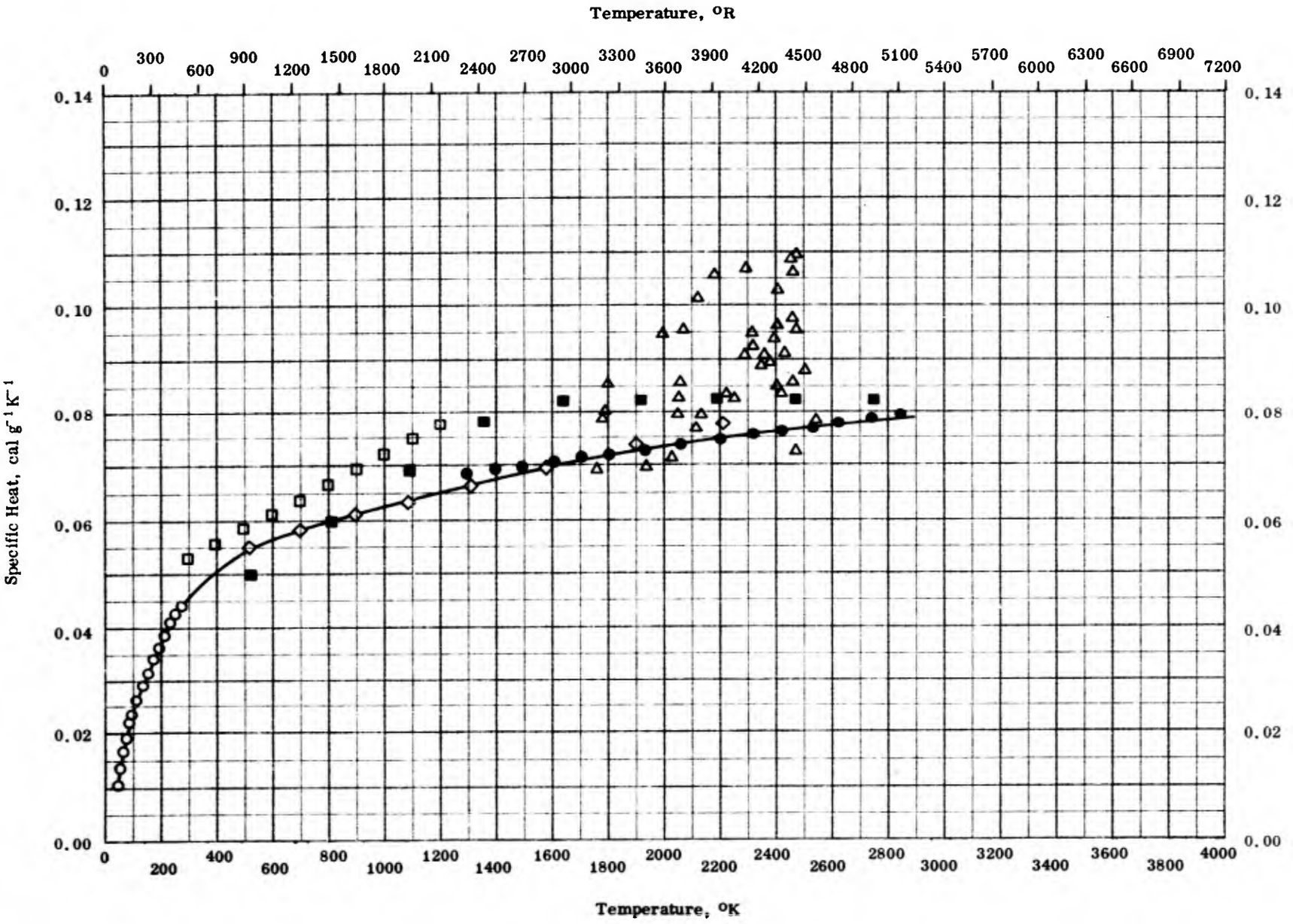


ELECTRICAL RESISTIVITY -- TANTALUM CARBIDE

ELECTRICAL RESISTIVITY -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	294-2711	2.4	93.8 Ta, 6.77 C, and 0.1> N.	Hot-pressed; max. exposure temperature 4800 F.



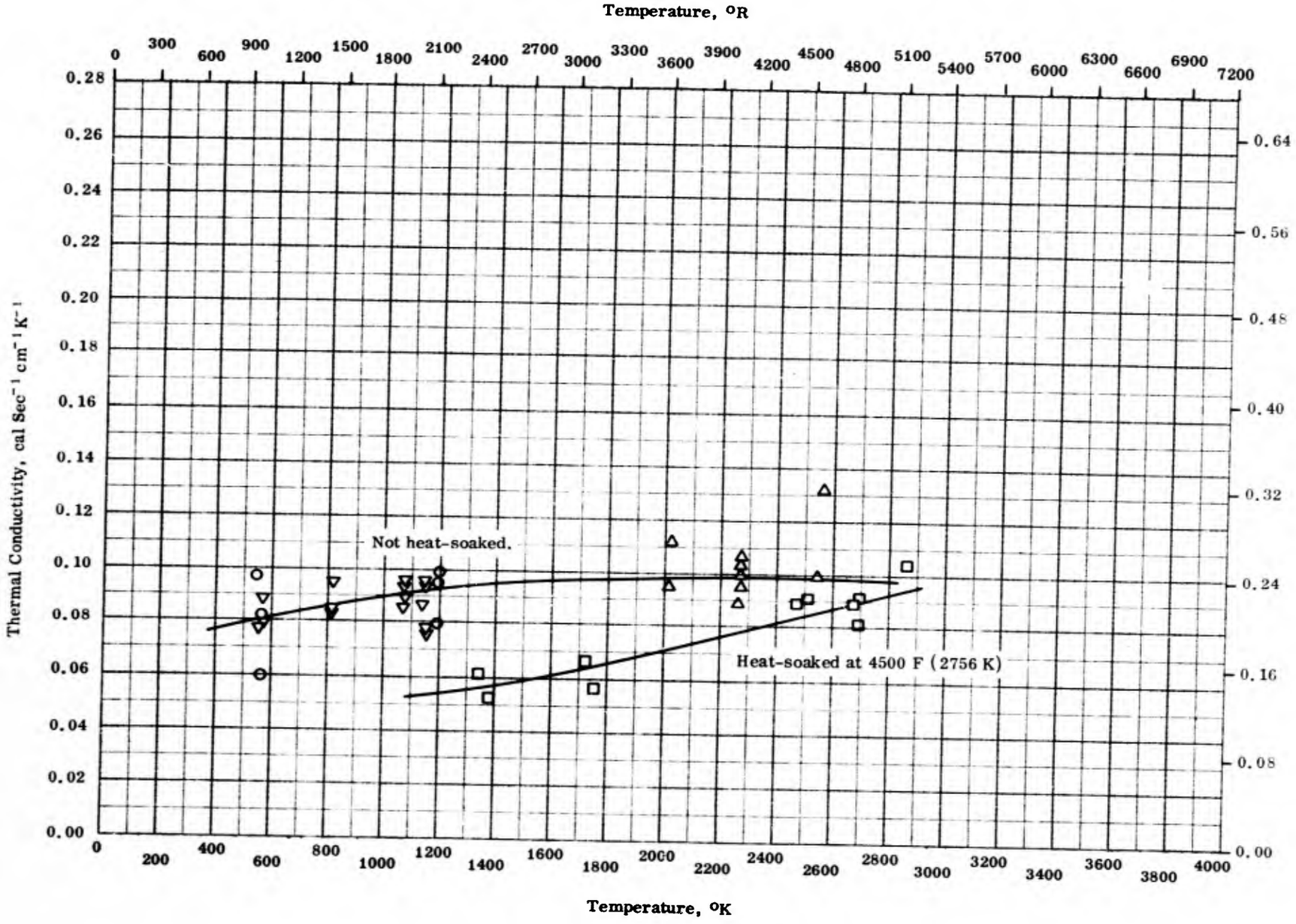
TPRC

SPECIFIC HEAT -- TANTALUM CARBIDE

SPECIFIC HEAT -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	40-1	53-294		TaC; 99.95 TaC, 0.03 free C, and 0.02 other impurities.	
□	65-1	300-1200	0.7	TaC; traces of Ca, Cu, and Si.	
△	62-16	1763-2544	5.0	TaC. 90.48 Ta, 6.27 total C, 0.04 free C, 1.62 Nb, 0.9 Ti, 0.22 Hf, 0.20 Fe, 0.18 O_2, 0.17 Zr, 0.09 N_2, 0.07 Mn, 0.01 > Cr, 0.01 > Cu, and 0.01 > Ni, density 82.2 lb ft^{-3}.	Hot pressed at 1350 C and 2000 psi for 1 hr.
◇	62-20	523-2214		TaC; 6.29 total C, 6.24 combined C, and 0.019 free C.	Sprayed samples.
●	63-11	1296-2843	1.8	TaC; 92.14 Ta, 6.21 C, 0.80 W, 0.50 Nb, 0.20 Fe, and 0.05 free C.	
■	60-8 also 62-5	523-2755	≤5.0	TaC; 93.75 < Ta, 6.14 C, 0.1 W, and 0.01 > Al, Ca, Fe, Mg, Na, Nb, Ni, Si, Sn, Ti, and Zr; density 476 lb ft^{-3}.	Hot pressed.

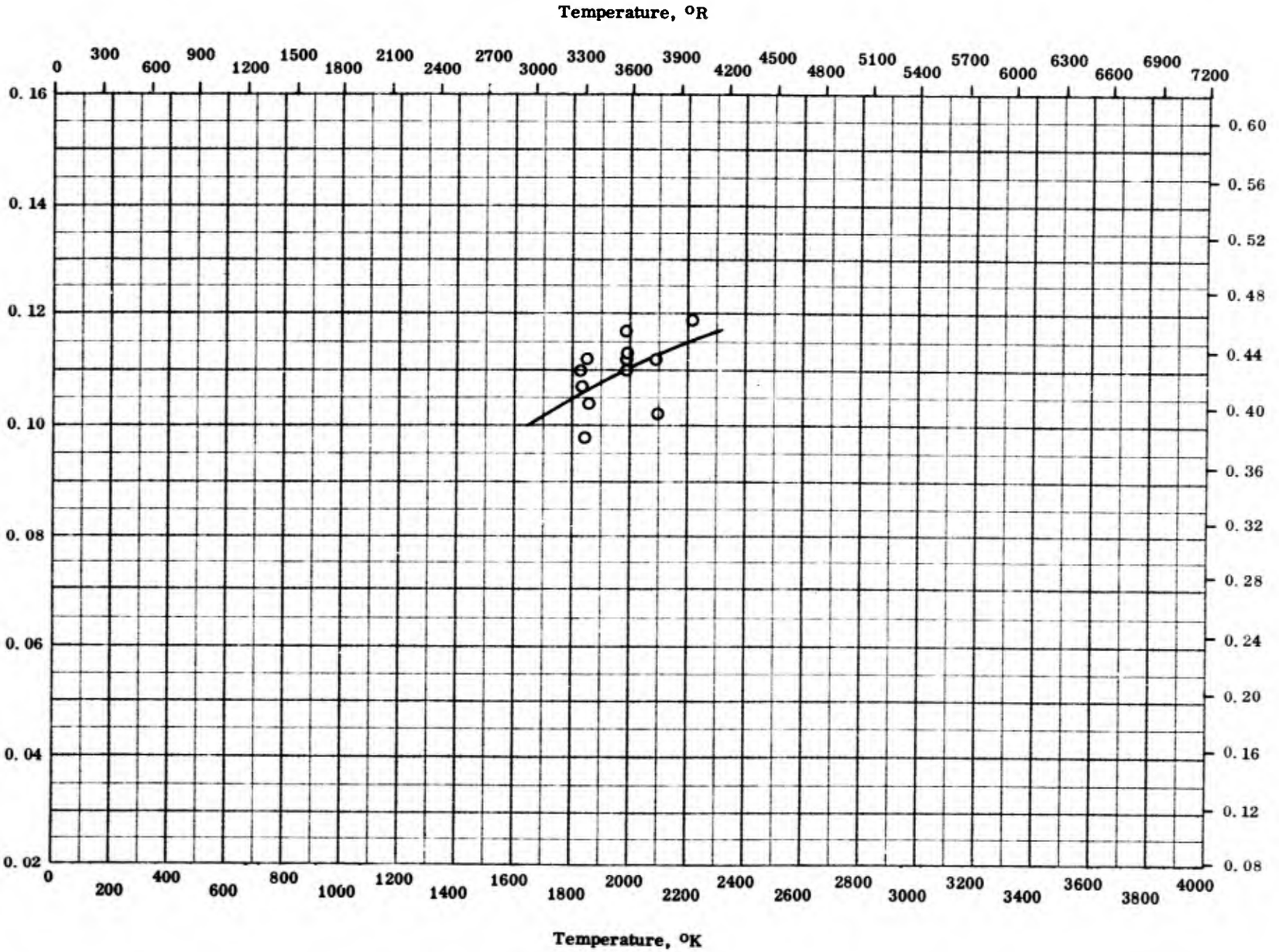


THERMAL CONDUCTIVITY -- TANTALUM CARBIDE

THERMAL CONDUCTIVITY -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	537-1194		TaC; 93.75 Ta, 6.14 C, 0.1 W, and 0.01 > Si, Mg, Ca, Al, Ti, Nb, Sn, Zr, Fe, Na, Mn, Mg, and Ni; density 866 lb ft^{-3}.	Hot-pressed.
△	62-5	2008-2555		Same as above	Same as above; sample found pitting and spalling after measurement.
▽	62-5	552-1151		Same as above.	Hot pressed.
□	62-5	1342-2855		Same as above.	Same as above except heat-soaked at 4500F; sample found pitting and spalling after measurements.

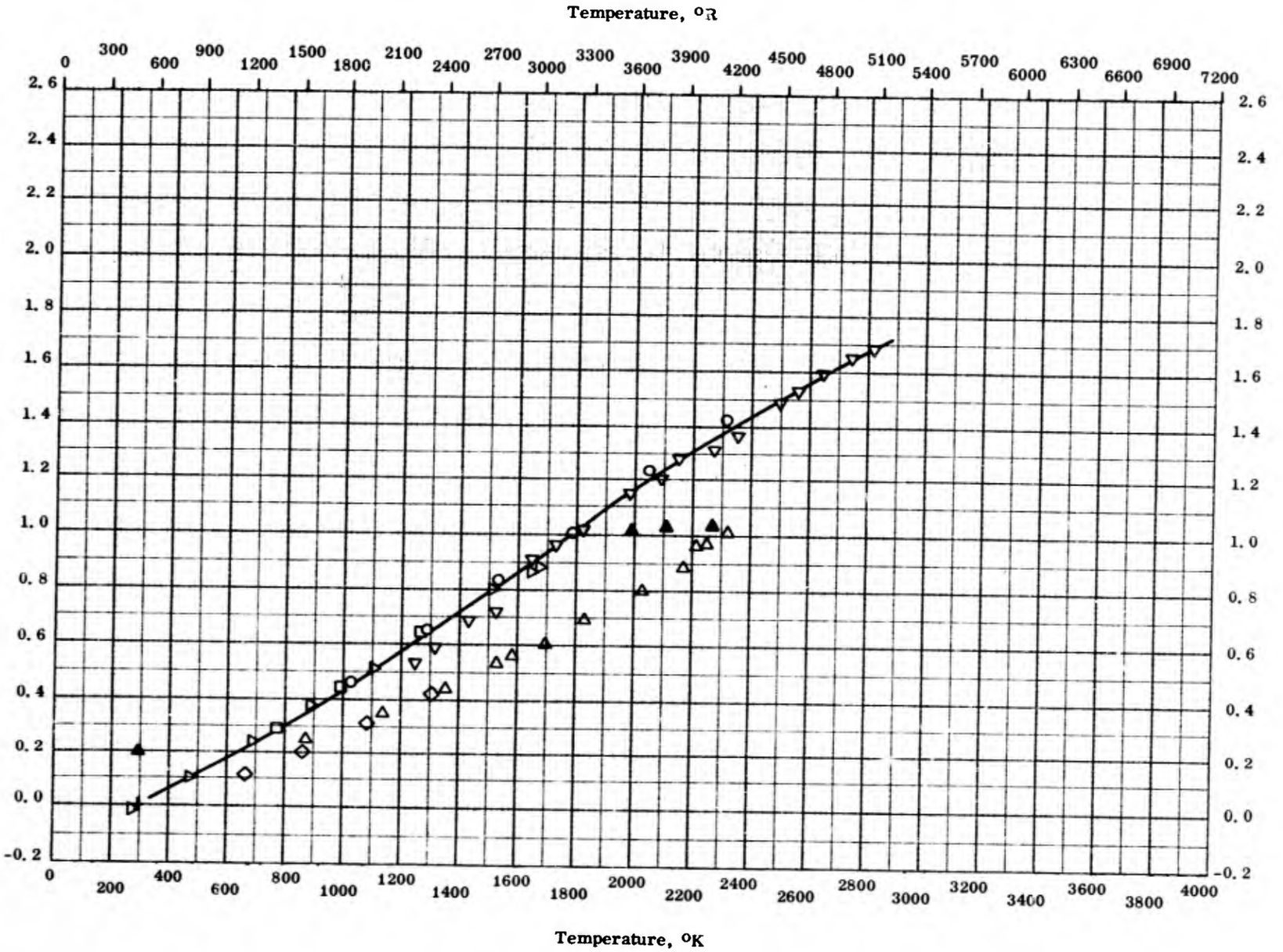


THERMAL DIFFUSIVITY -- TANTALUM CARBIDE

THERMAL DIFFUSIVITY -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-3	1828-2213		93.7 Ta, 6.3 C, 0.05 Cu, 0.05 Si, 0.05>Fe, 0.005>Zr, 0.03 Ti, 0.01 Cr, 0.005 Ca, 0.002 Mg, and 0.001>Ag by chemical analysis of as-received sample; average grain size 10(ASTM); density 12.44 g cm^{-3}.	Hot-pressed.



THERMAL LINEAR EXPANSION -- TANTALUM CARBIDES

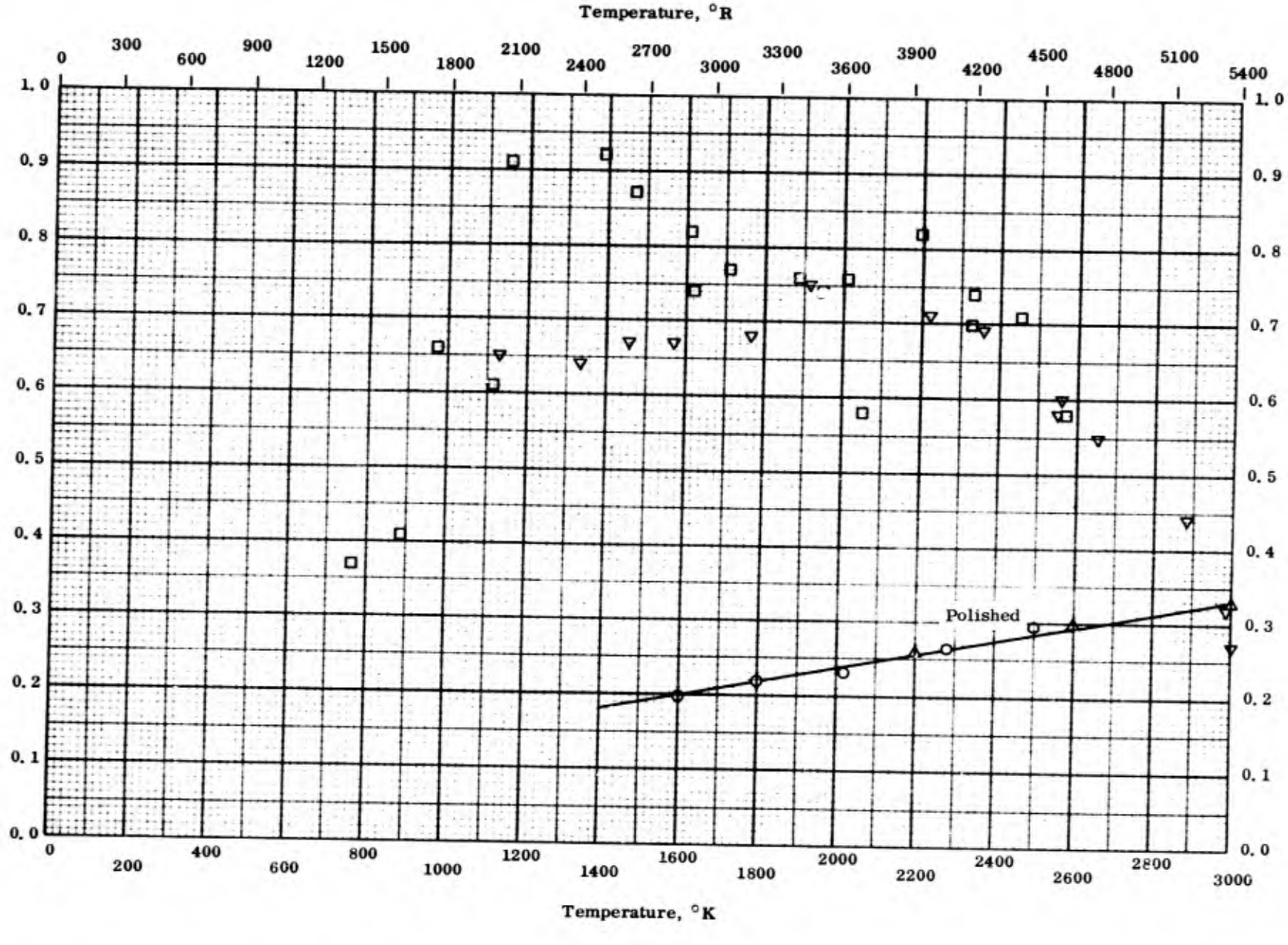
THERMAL LINEAR EXPANSION -- TANTALUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-31	298-2317		$TaC_{1.02}$; 93.81 Ta, 6.35 C, 0.10 Zr, 0.05 Nb, 0.02 Fe, 0.02 O, 0.01 Cr, and 0.01 Ti; total impurity 0.21, total analysis 100.37; average reacted powder particle size 7 microns.	Prepared from tantalum reacted at about 2300 C for 3 hrs, cold-pressed at 14000 psi using camphor, and sintered in vacuum at about 1800 C for 1 hr; x-ray diffraction method; data obtained from (422) and (511 / 333).
□	58-7	296-1267		$TaC_{0.984}$ from Powder Metallurgy Section, Los Alamos Scientific Lab.; 93.4 Ta and 6.15 C (<0.05 free C).	X-ray diffraction method.
△	62-5	294-2322		TaC, Kennametal, Inc.; before exposure 93.8 Ta, 6.77 C, and <0.1 N, elements found by semi-quantitative emission spectrography 0.1 Fe and 0.1 Si; after exposure 93.8 Ta, 6.52 C, and <0.1 N; density at 25 C by ASTM method B 311-58 before exposure 14.0 g cm^{-3}, after exposure 13.9 g cm^{-3}; initial and final length 3.0010 in. [Author's design: Run SRI-E7]	Hot pressed; measured in helium.
▲	62-5	294-2322		Same as above.	Cooling data for above sample.
◇	61-20	293-1303		Almost stoichiometric composition.	
▽	64-15	298-2814		Stoichiometry based on combined carbon $TaC_{0.98}$; 93.49 Ta, 6.09 total C, 0.02 free C, 0.14 Fe, 0.12 Si, 0.02 B, 0.006+ Ni, 0.006 Al, and <0.004 Nb, Pb; prepared from tantalum pentoxide (99.67 Ta_2O_5 from Fansteel Metallurgical Corp.) and Thermatomic Carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.862 in.; density 12.81 g cm^{-3}, 87.4% theoretical density. [Author's design: Run 1, Run 2, and Run 3]	Prepared from Ta_2O_5 reacted with Thermatomic carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon perpendicular to hot pressing direction; combined data for 3 samples.

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	55-11	273-1673		0.1-1.0 Nb, 0.01-0.1 each Al, Fe, Si, Ti, 0.001-0.01 Ca, and 0.0001-0.001 each Cu, Mg.	Sintered at 1200 C in Al_2O_3 holder; measured by x-ray diffraction in He atm; author estimates high end of curve is low due to loss of C (1 C at 2300 R, 5 C at 3000 R).

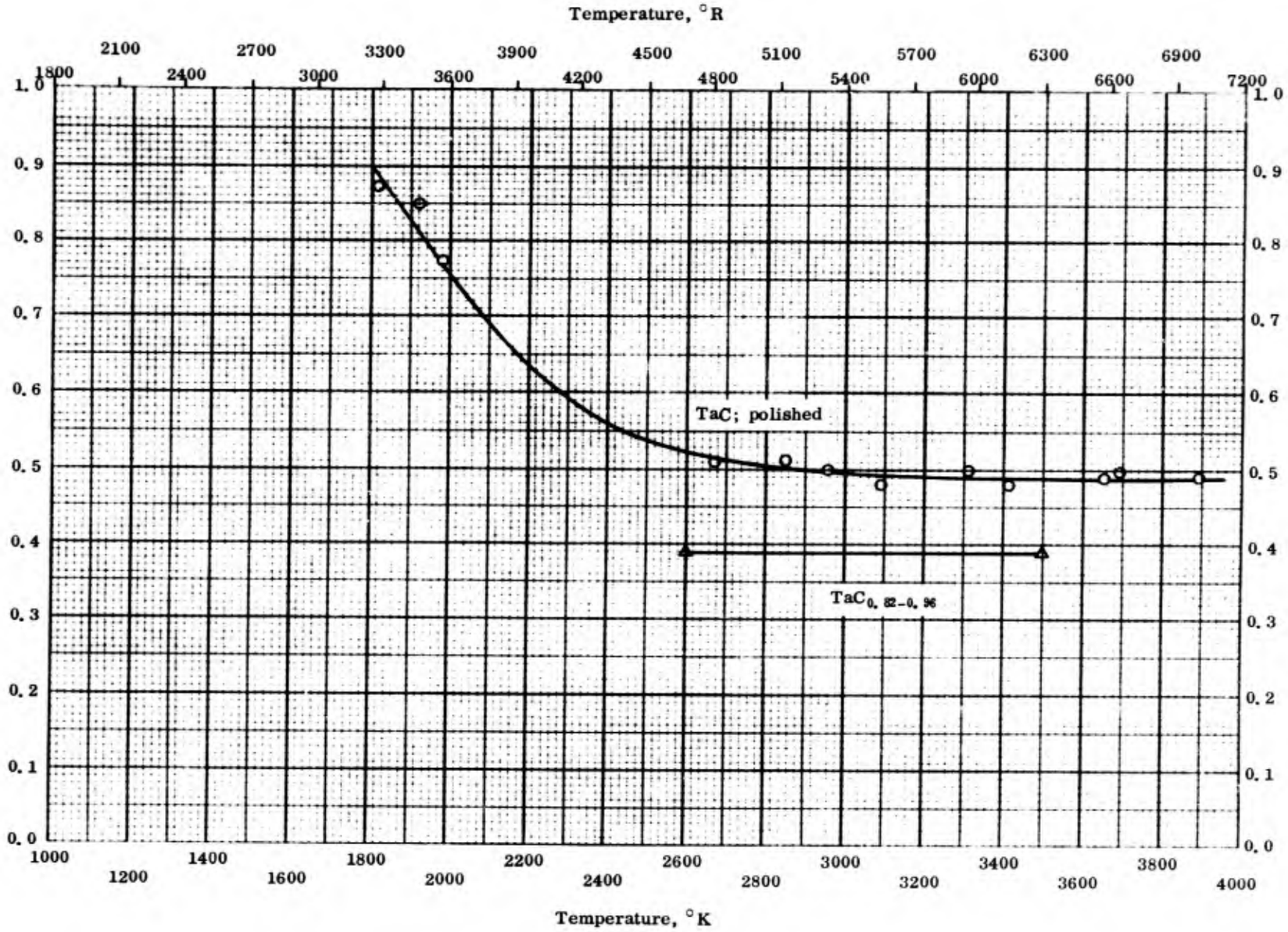


NORMAL TOTAL EMITTANCE -- TANTALUM CARBIDE

NORMAL TOTAL EMITTANCE -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-23	1600-2500		TaC.	Polished; measured in vacuum at low temperature and in argon at 1 atm at high temperature.
△	61-7	1800-3000		TaC.	Polished; measured in vacuum at low temperature and in argon at high temperature.
□	62-6	766-2577	10	TaC with 0.1> N; density 14.1 gm cm^{-3}.	
▽	62-6	1133-3005	10	Same as above.	Same as above; second run.

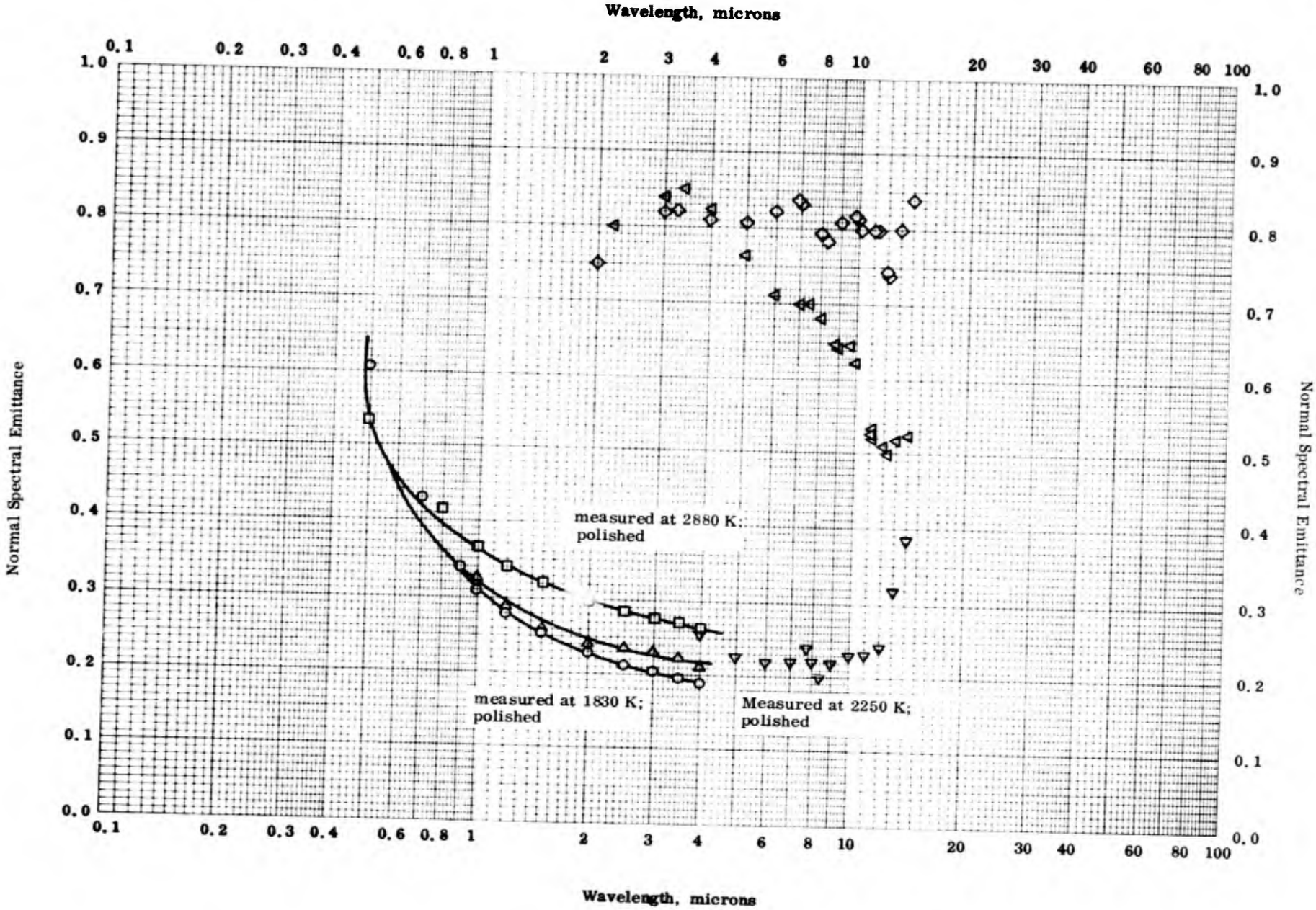


NORMAL SPECTRAL EMITTANCE -- TANTALUM CARBIDE

NORMAL SPECTRAL EMITTANCE -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range° K	Rept. Error %	Sample Specifications	Remarks
O	61-9	0.65	1819-3893		TaC	Polished with 400 grit diamond wheels.
Δ	62-26	visible range	2600-3500		Composition between $TaC_{0.82}$ to $TaC_{0.96}$; filament.	Data shows the average value within the specified temperature range.

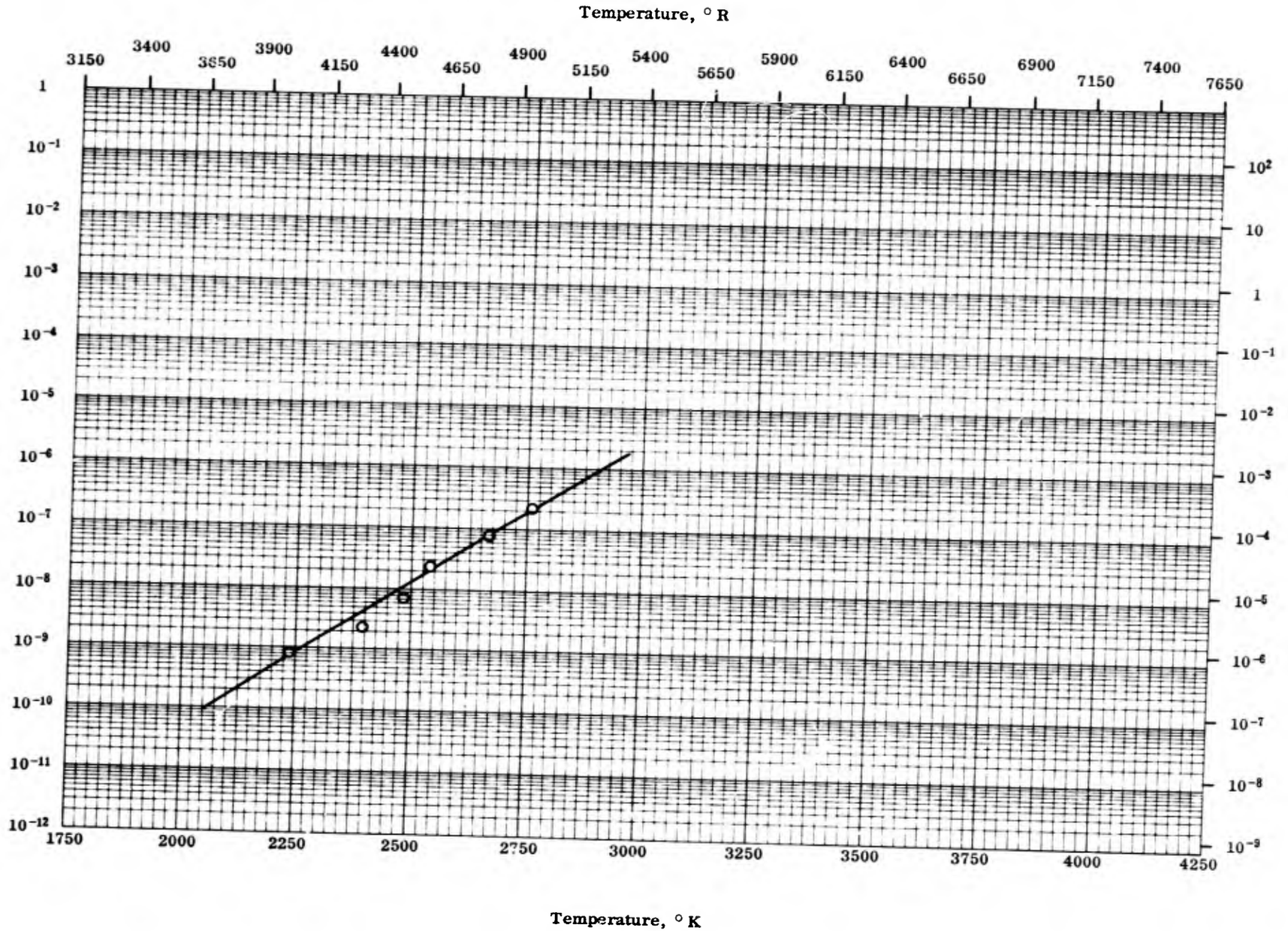


NORMAL SPECTRAL EMITTANCE -- TANTALUM CARBIDE

NORMAL SPECTRAL EMITTANCE -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	61-5	1830	0.5-4.0		TaC.	Polished; measured in vacuum at low temperature and in argon at 1 atm at high temperature.
△	61-5	2250	0.7-4.0		Same as above.	Same as above.
□	61-5	2880	0.5-4.0		Same as above.	Same as above.
▽	60-13	3234	4.0-14.0		Same as above.	Smooth, flat (not optically polished) surface; measured in 90 Ar + 10 H_2; data taken from smooth curve.
◇	60-13	2250	2.0-14.0		Same as above.	Same as above.
◁	60-13	1350	2.2-14.0		Same as above.	Same as above.



VAPOR PRESSURE -- TANTALUM CARBIDE

VAPOR PRESSURE -- TANTALUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-1	2235-2390		Not given.	Pressure of carbon over tantalum carbide.

PROPERTIES OF THORIUM CARBIDES

REPORTED VALUES

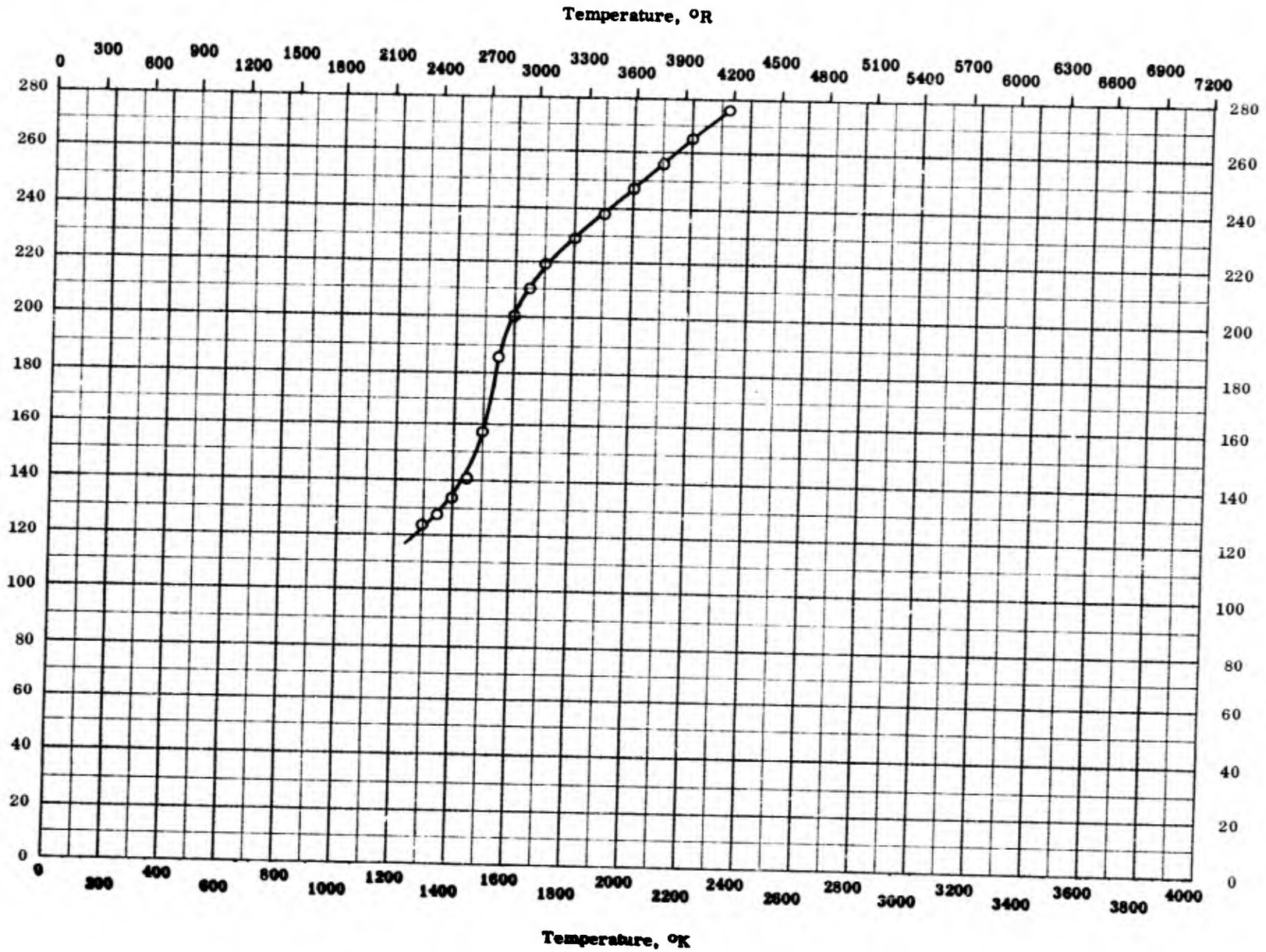
Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
○	ThC_2	9.6*	600*
□	ThC_2	9.5 ± 0.5	590 ± 30
Melting Point		K	R
△	ThC	2897 ± 25	5215 ± 45
▽	ThC_2	2928 ± 25	5270 ± 45

*Most probable value for this compound.

PROPERTIES OF THORIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-10	298		ThC_2.	Density computed from x-ray measurement.
□	50-10	298		ThC_2.	Density by pycnometer.
△	49-7	2872-2922		ThC; 95.08 Th and 4.92 C; prepared from Th with 0.09 C and traces of O_2 and N_2 and spectrographically pure graphite.	By powder metallurgy; variation in results for high Th ratio samples due to O_2 and N_2 in grain boundary; M. P. by observation of first liquid drop.
▽	49-7	2903-2953		ThC_2; 90.62 Th and 9.38 C; same as above.	Same as above.

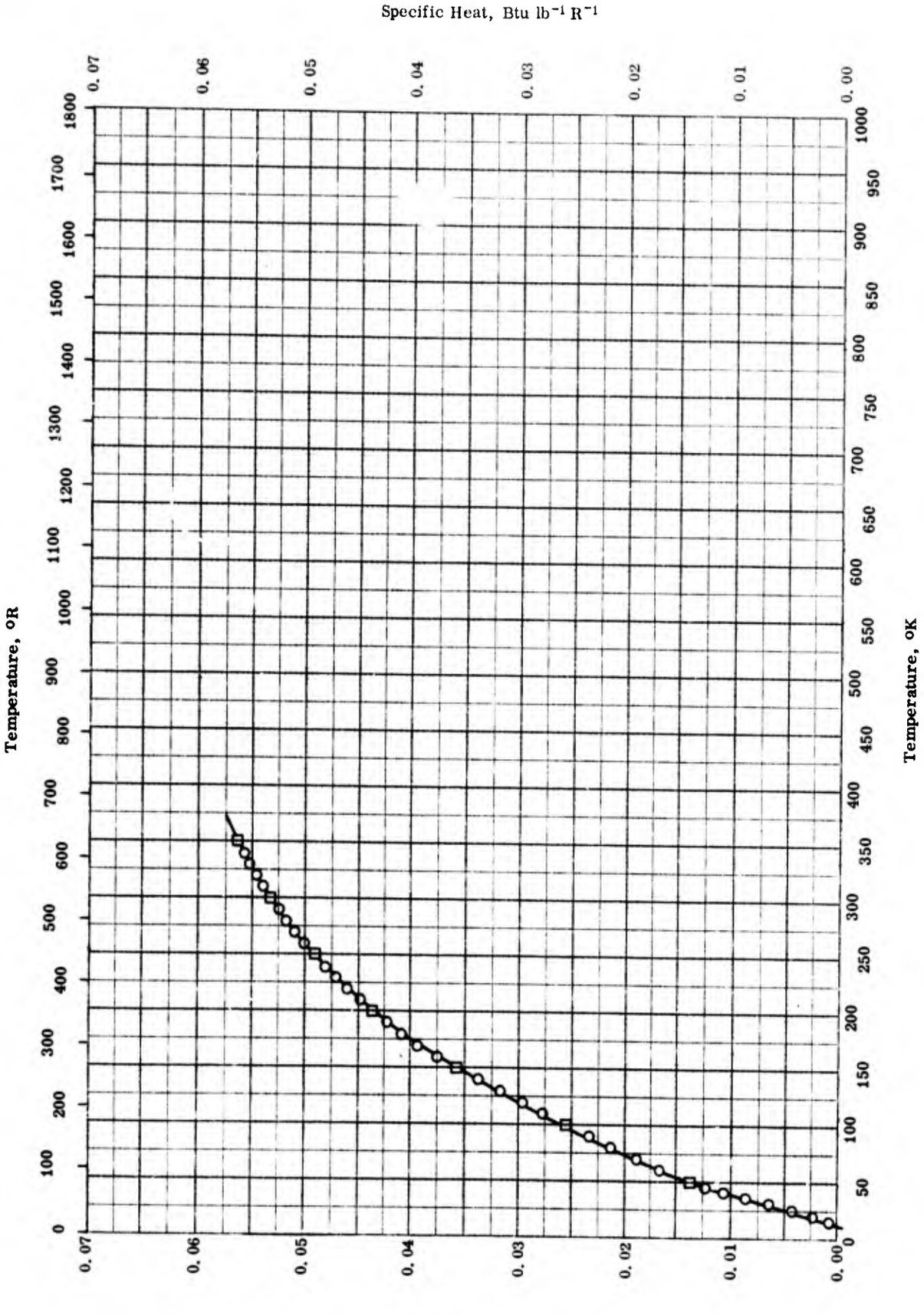


ELECTRICAL RESISTIVITY -- THORIUM CARBIDE

Electrical Resistivity, ohm cm x 10⁶

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-8	1300-2325	± 3.0	ThC_2.	Possible phase change near 1550 K.

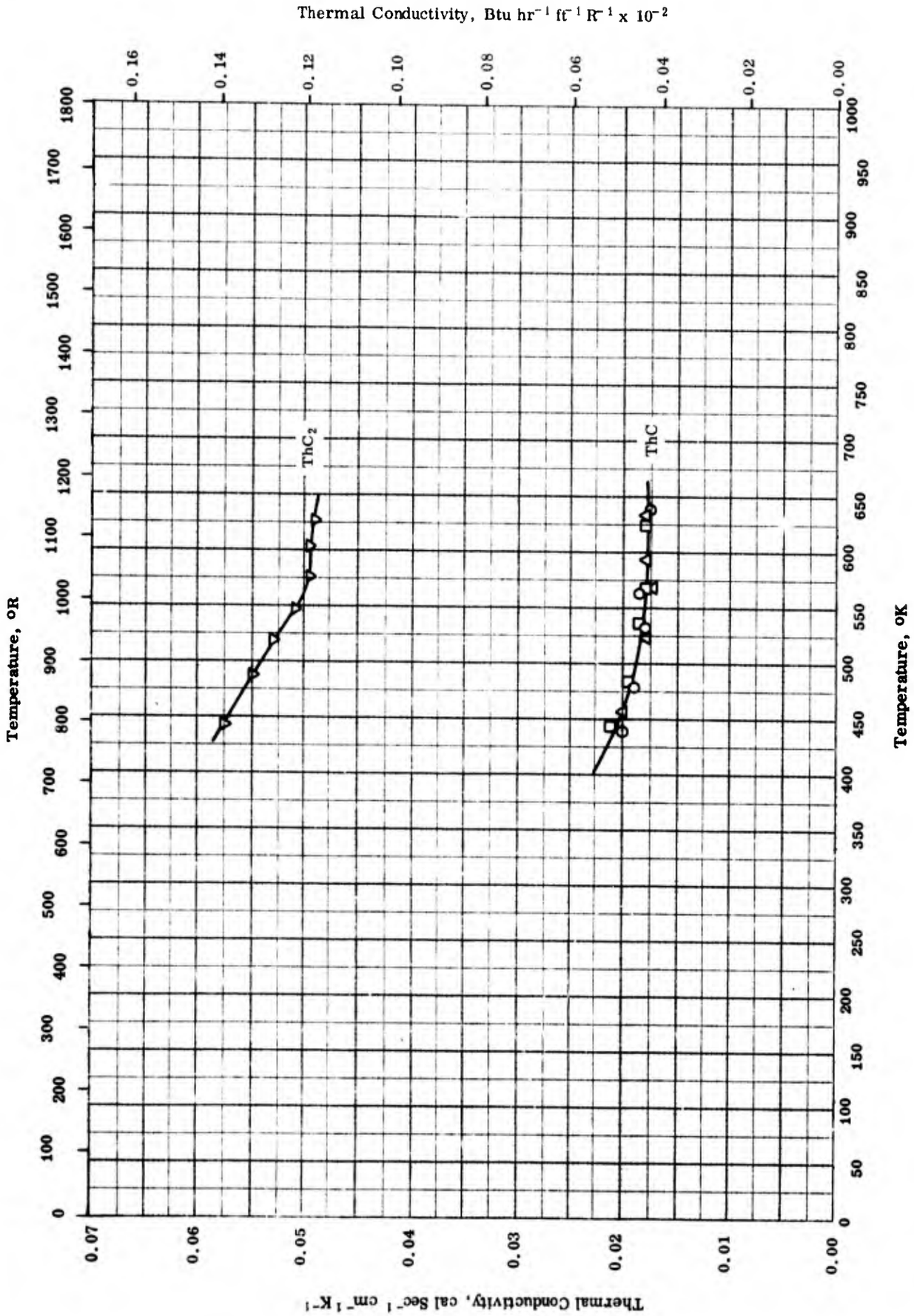


SPECIFIC HEAT -- THORIUM CARBIDES

SPECIFIC HEAT -- THORIUM CARBIDES

REFERENCE INFORMATION

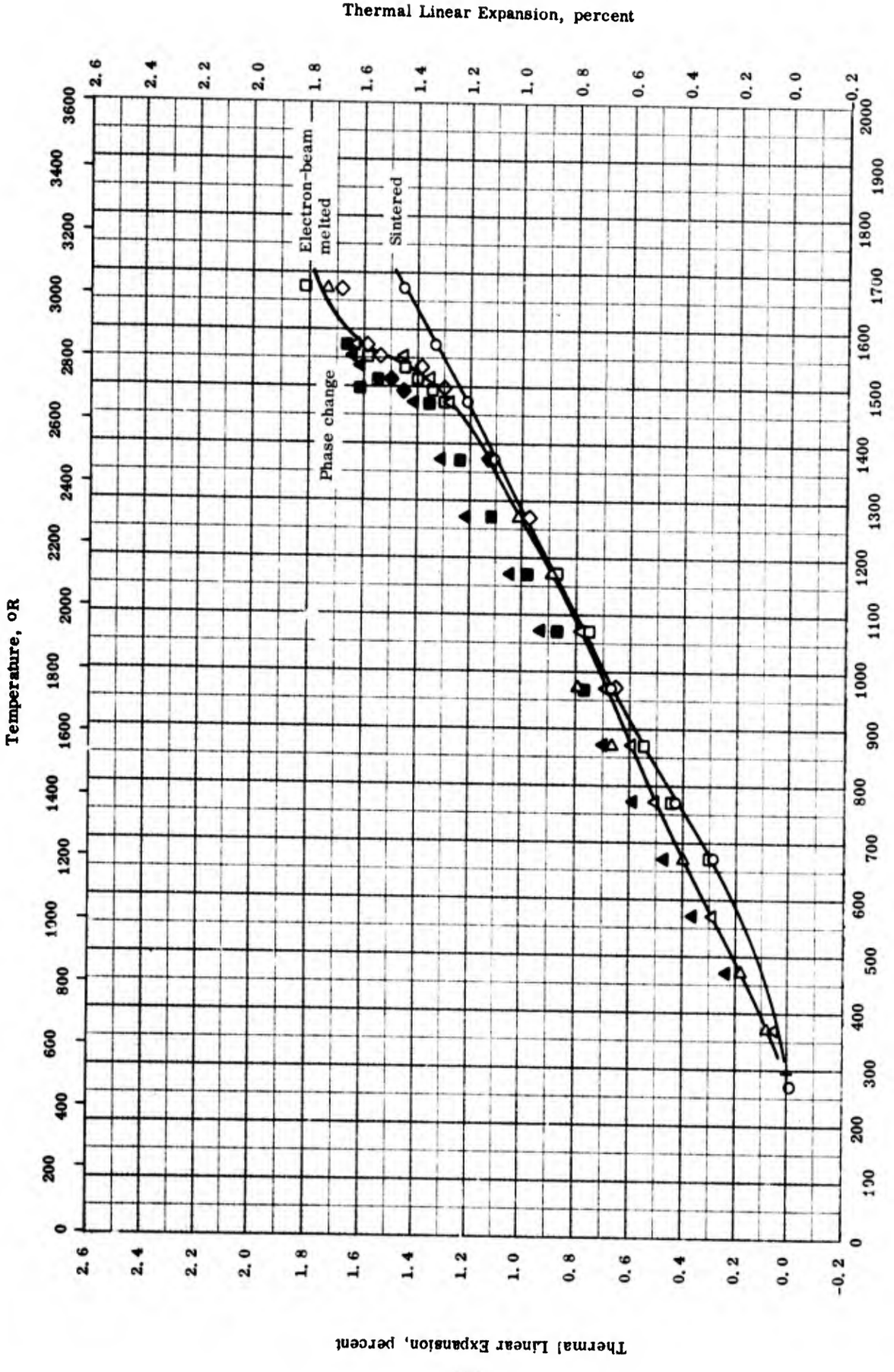
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-6	5-350	0.1	Th $C_{1.93}$; 8.99 C, 1.758 W, 0.0575 O_2, 0.00268 N_2, and 0.00228 H_2.	Turned and melted several times, crushed to powder, and remelted several more times.
□	65-4	5-350	0.1	ThC_2; 99.21 ThC_2, and 0.79 free C.	Prepared from thorium powder and graphite; pressed at 700 Kg cm^{-2} pressure into 0.8 cm diameter pellets and heated 30 min under vacuum at 2100 C, pellets were crushed and ground, heated for 5 hrs at 2000 C; then reground and reheated for 5 hrs at 2000 C to homogenize the sample.



THERMAL CONDUCTIVITY -- THORIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-9	438-638		ThC; density 8.5 g cm^{-3}.	Measured in vacuum of 10^{-5} mm Hg.
□	62-9	443-624		Same as above.	Same as above.
△	62-9	457-633		Same as above.	Same as above.
▽	62-9	443-627		ThC_2; density 6.6 g cm^{-3}.	Same as above.

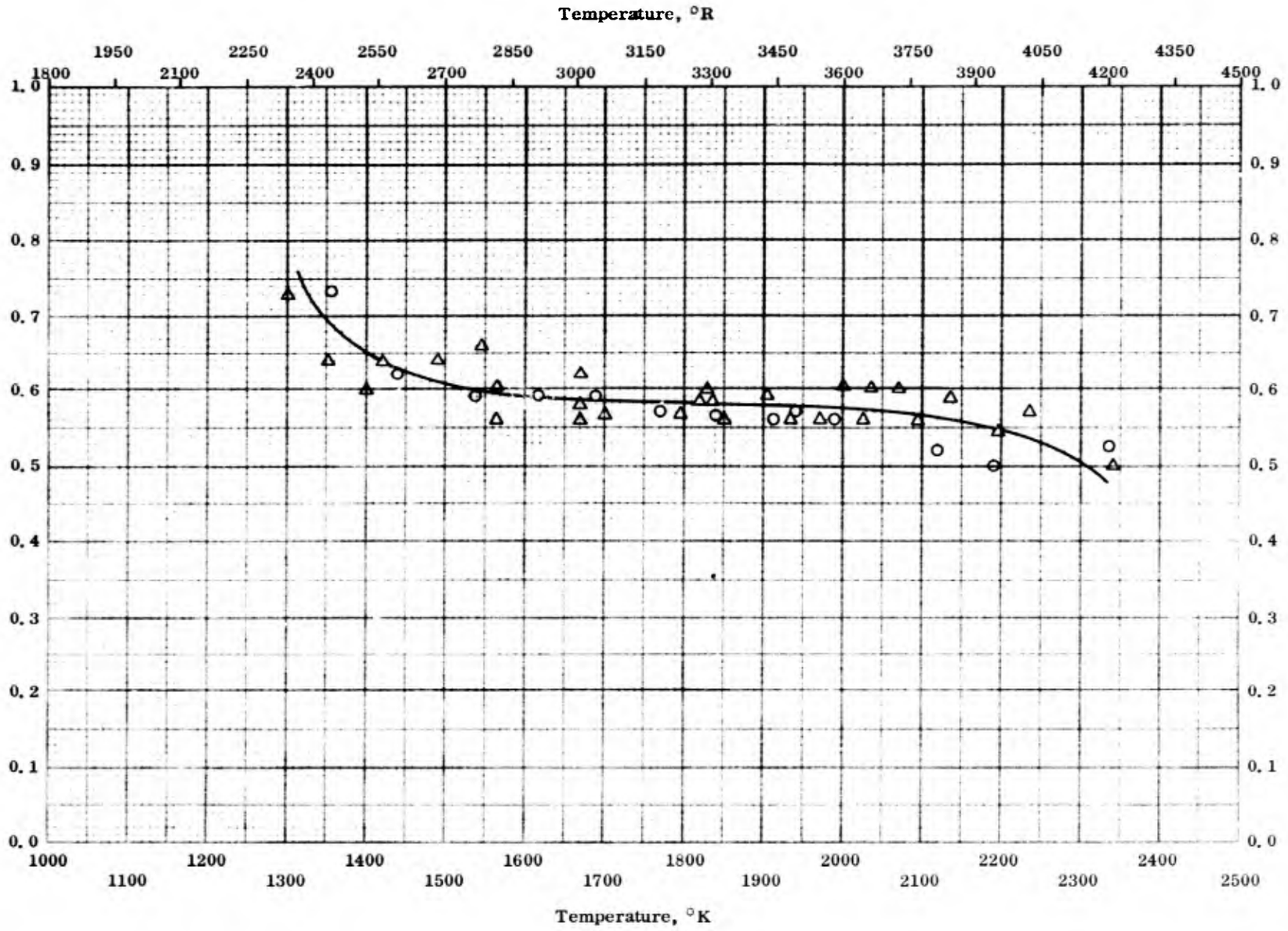


THERMAL LINEAR EXPANSION -- THORIUM CARBIDE

THERMAL LINEAR EXPANSION -- THORIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-28	273-1673		ThC_2 with 9.38 C; density 8.9 g cm^{-3}, 93% theoretical density. [Author's design: Sample No. 503]	Metal and graphite powders mixed in suitable proportions, cold compacted under 500 kg cm^{-2}, reacted under vacuum in hot pressing furnace at pressure of 250 kg cm^{-2}, and heat treated at 1800 C for 4 hrs; measured with heating rate of 150 C hr^{-1}; author states that break in curve at about 1275 C indicates a phase change.
□	63-28	273-1673		ThC_2. [Author's design: Sample No. B 1]	Electron-beam melted; measured with heating rate of 150 C hr^{-1}; author states that break in curve at about 1290 C indicates a phase change.
■	63-28	973-1573		Same as above.	Cooling cycle for above sample.
◇	63-28	273-1673		Same as above.	Fourth heating cycle for above sample.
◆	63-28	973-1673		Same as above.	Fourth cooling cycle for above sample.
△	63-28	273-1673		ThC_2. [Author's design: Sample No. B 2]	Electron-beam melted; measured with heating rate of 150 C hr^{-1}; author states that break in curve at about 1280 C indicates a phase change.
▲	63-28	373-1673		Same as above.	Cooling cycle for above sample.
▷	63-28	273-1673		ThC_2. [Author's design: Sample No. B 4]	Electron-beam melted; measured with heating rate of 150 C hr^{-1}; author states that break in curve at about 1290 C indicates a phase change.



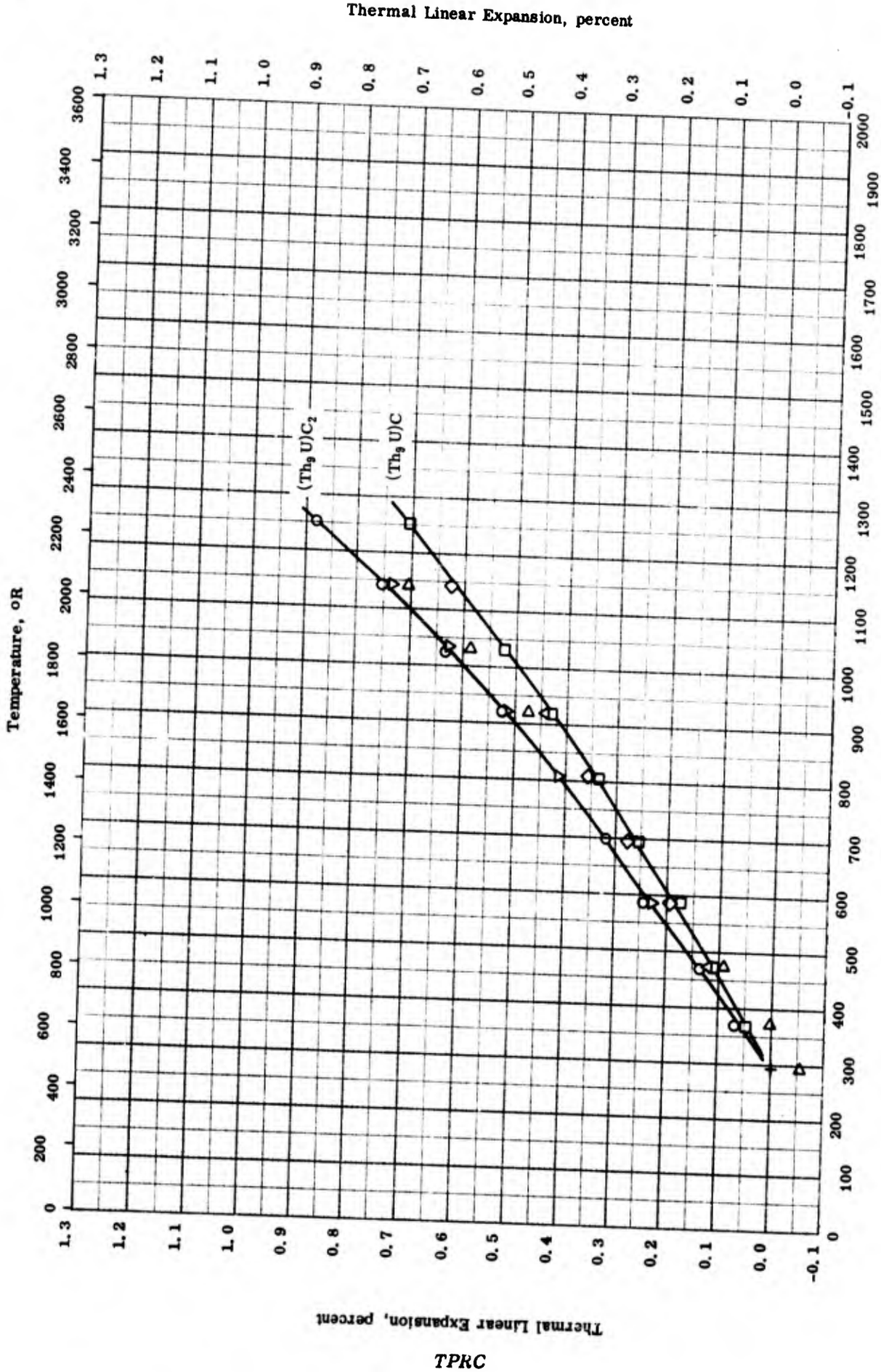
NORMAL SPECTRAL EMITTANCE -- THORIUM CARBIDES

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- THORIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-8	0.65	1355-2335		Th C from Carborundum Co.	
△	62-8	0.65	1300-2340		Th C_2 from Carborundum Co; density 8.96 g cm^{-3}.	



THERMAL LINEAR EXPANSION — THORIUM URANIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-11	293-1252	2	(90 Th - 10 U) C_2.	Prepared by arc melting button materials and drop casting through a hole in a hearth into a graphite mold; measured under vacuum of approx 5 x 10^{-5} mm Hg.
□	64-11	293-1253	2	(90 Th - 10 U) C.	Same as above.
◇	62-43	293-1144		(Th_9U) C; dimensions 3/8 in. diameter by 2 1/2 in. long.	Cylindrical castings.
△	62-43	293-1144		Same as above.	Cooling data for above sample.
▽	62-43	293-1144		(Th_9U) C_2; dimensions 3/8 in. diameter by 2 1/2 in. long.	Cylindrical castings.
▷	62-43	293-1144		Same as above.	Cooling data for above sample.

PROPERTIES OF TITANIUM CARBIDES

REPORTED VALUES

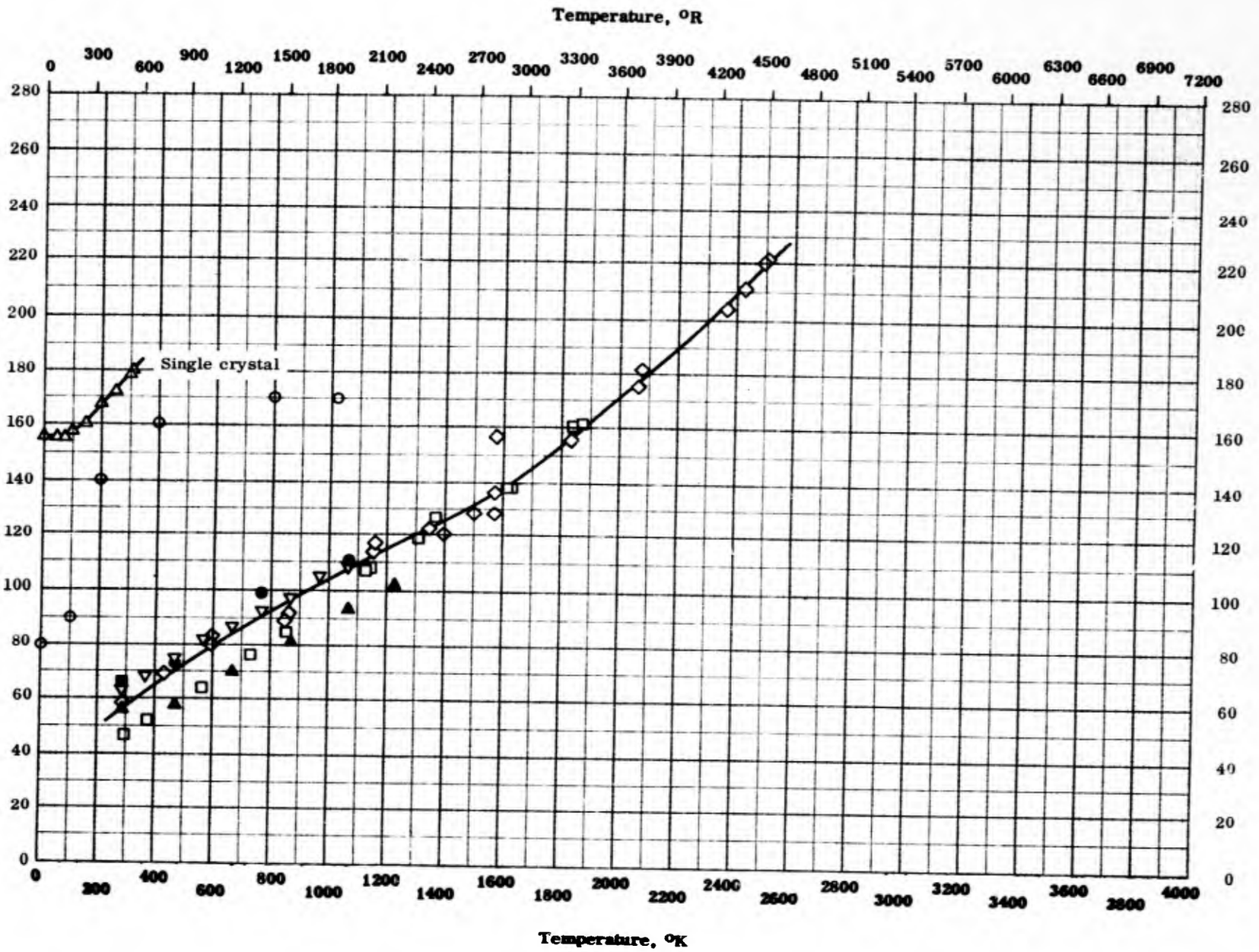
Density		g cm^{-3}	lb ft^{-3}
○	TiC	4.81	300
□	TiC	4.92± 0.02*	307± 1*
△	$TiC_{0.75}$	4.702	293.5
◇	$TiC_{0.40}$	4.469	279.0
▽	TiC	4.74	296
Melting Point		**K**	**R**
◁	TiC	3407 ± 7*	6132 ± 12*
▷	TiC	3303	5945
●	TiC	3523	6341

*Most probable value for this compound.

PROPERTIES OF TITANIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	46-1	298		99.0 TiC with 79.56 Ti, 19.85 C, and 0.4 unreacted Ti; prepared from powdered Ti and 99.7 C.	Prepared by heating Ti and C in vacuum to 2370 F; reground and reheated to 2370 F.
□	49-6	298		TiC; prepared from 99.9 Ti sheet.	Sintered up to 2400 C.
△	49-6	298		$TiC_{0.75}$; same raw material as above.	Same as above.
◇	49-6	298		$TiC_{0.40}$; same raw material as above.	Same as above.
▽	50-8	298		TiC with 77.04 Ti, 17.07 combined C, and 2.76 free C.	Hot-pressed in graphite mold; author computed density 4.91 g cm^{-3} from lattice measurements of others.
◁	56-11	3400-3414		TiC.	
▷	55-13	3303		TiC.	M.P. obtained calibrated optical pyrometer sighting on liquid-solid interface.
●	60-8	3523		TiC.	



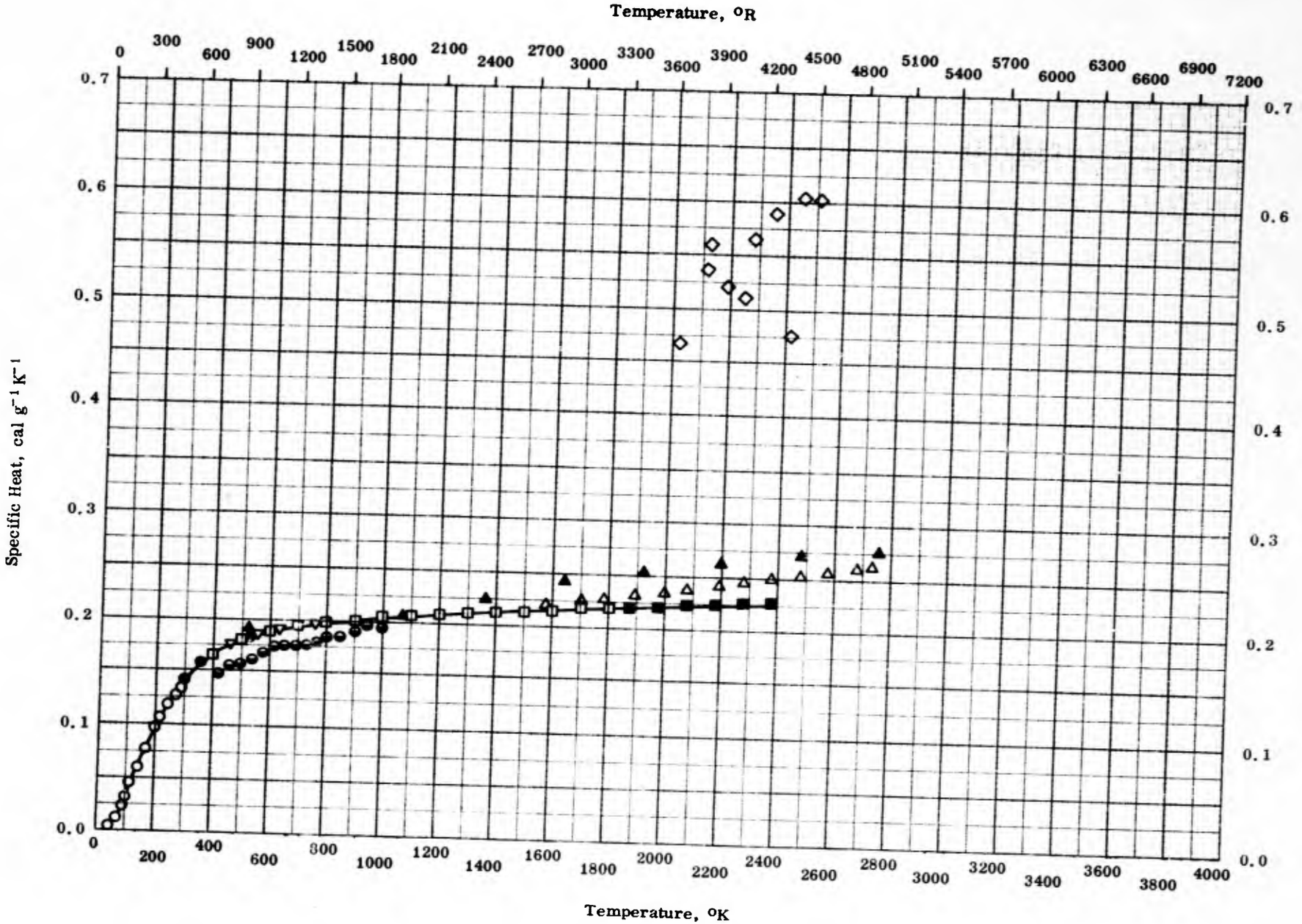
ELECTRICAL RESISTIVITY -- TITANIUM CARBIDE

Electrical Resistivity, ohm cm x 10⁶

ELECTRICAL RESISTIVITY -- TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-5	2-1022	±10	TiC; 1 mm dia. wire.	
△	62-14	4-313		TiC; single crystal.	
□	62-6	297-1866	2.4	TiC.	Hot-pressed; max. exposure temperature 4850 F.
◇	62-6	294-2505	2.4	TiC.	Same as above.
▽	62-12	296-1073		TiC.	
●	64-3	296-1073		Single phase TiC with 80.3±0.3 Ti, 19.3 C, and 0.2> metallic impurities; density 4.77 g cm^{-3}.	
■	64-3	293		Same as above.	Heat-soaked at 2100 C.
▲	64-3	293-1223		Same as above.	

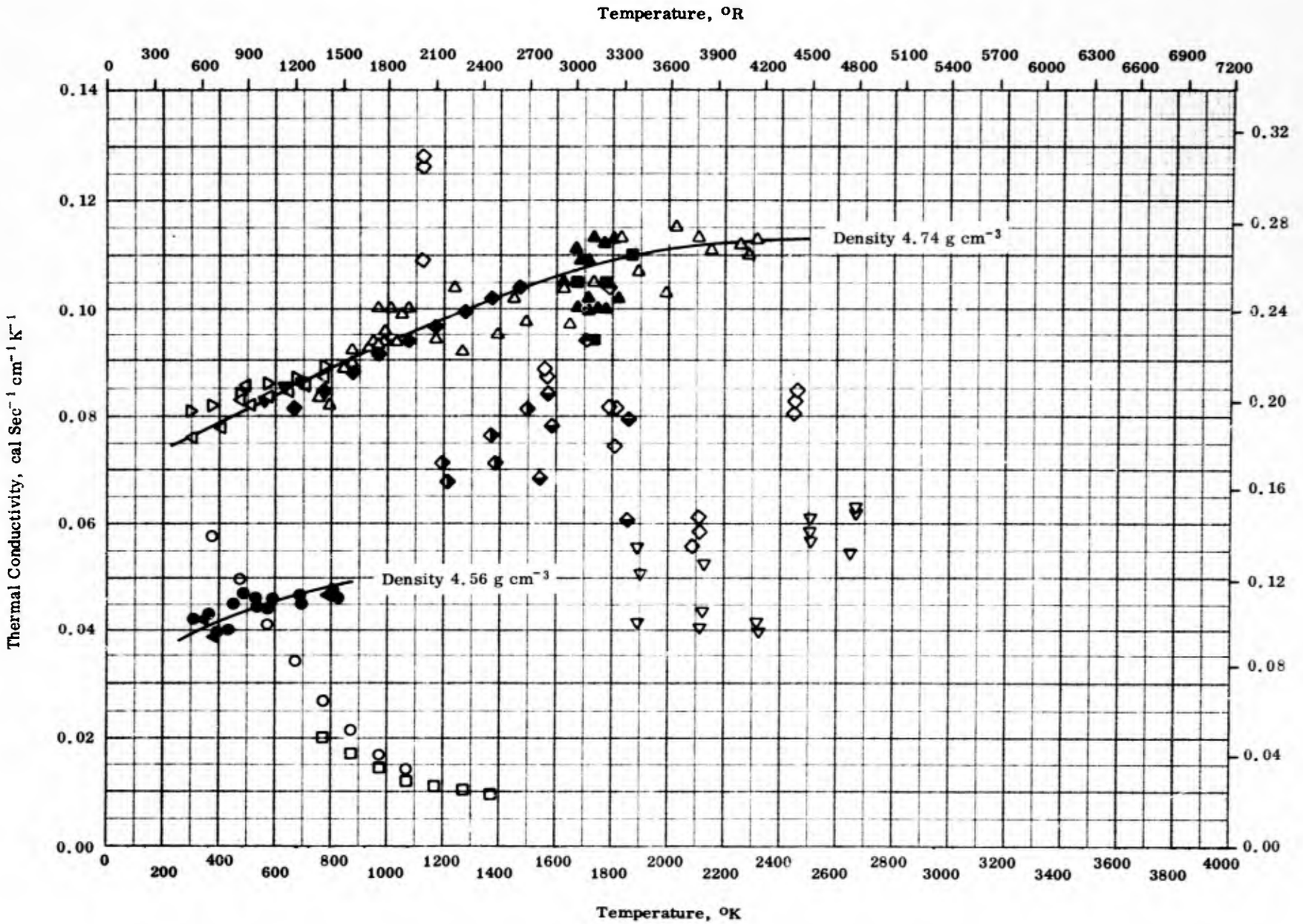


SPECIFIC HEAT -- TITANIUM CARBIDE

SPECIFIC HEAT -- TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	44-3	53-295		TiC; 96.08 TiC, 1.82 Ti O_2, and 0.06 unaccountable.	Corrected for impurities.
□	46-1	361-1735		TiC; 99.0 TiC and 0.4 free Ti; (79.56 Ti, 19.85 C), density 300 lb ft^{-3}.	Prepared by heating powdered Ti with 99.7 C in vacuum to 1300 C.
△	65-5	1274-2722	1.4	TiC; 79.42 Ti, 18.82 combined C, 0.71 free C, 0.1 > W, and 0.04 O_2.	Hot pressed in graphite dies and electrospark machined.
◇	62-16	2023-2121	5.0	TiC; 77.41 Ti, 17.78 total C, 0.56 Zr, 0.50 free Ti, 0.43 free C, 0.12 Fe, 0.1 > Al, 0.1 > Hf, 0.09 Nb, 0.004 Cu, and 0.001 > Mg.	Solid pieces machined to specification using diamond tool and electric discharge technique.
▽	64-3	298-403	±5	TiC; 80.3 Ti, 19.3 C, and 0.2 > metallic impurities, density 298 lb ft^{-3}.	
◒	64-3	423-1005	±5	TiC; 79.2 Ti, 20.2 C, and 0.2 > metallic impurities; density 296 lb ft^{-3}.	
●	64-3	293-816	±5	TiC; 80.3 Ti, 19.3 C, and 0.2 > metallic impurities; density 298 lb ft^{-3}; cube sample 0.122 in thick.	
■	64-3	1573-1873	±5	TiC; composition same as above; carborundum sample.	
▲	62-6	533-2755	≤5	TiC; before test: 79.8 Ti, 19.2 C, 0.9 N_2, 0.6 Fe, and 0.5 Zr; density 298 lb ft^{-3}; after test: 79.2 Ti, 19.0 C, and 0.6 N_2; density 300 lb ft^{-3}.	Hot pressed; crushed in hardened steel mortar to pass 100-mesh screen.



THERMAL CONDUCTIVITY -- TITANIUM CARBIDE

REFERENCE INFORMATION

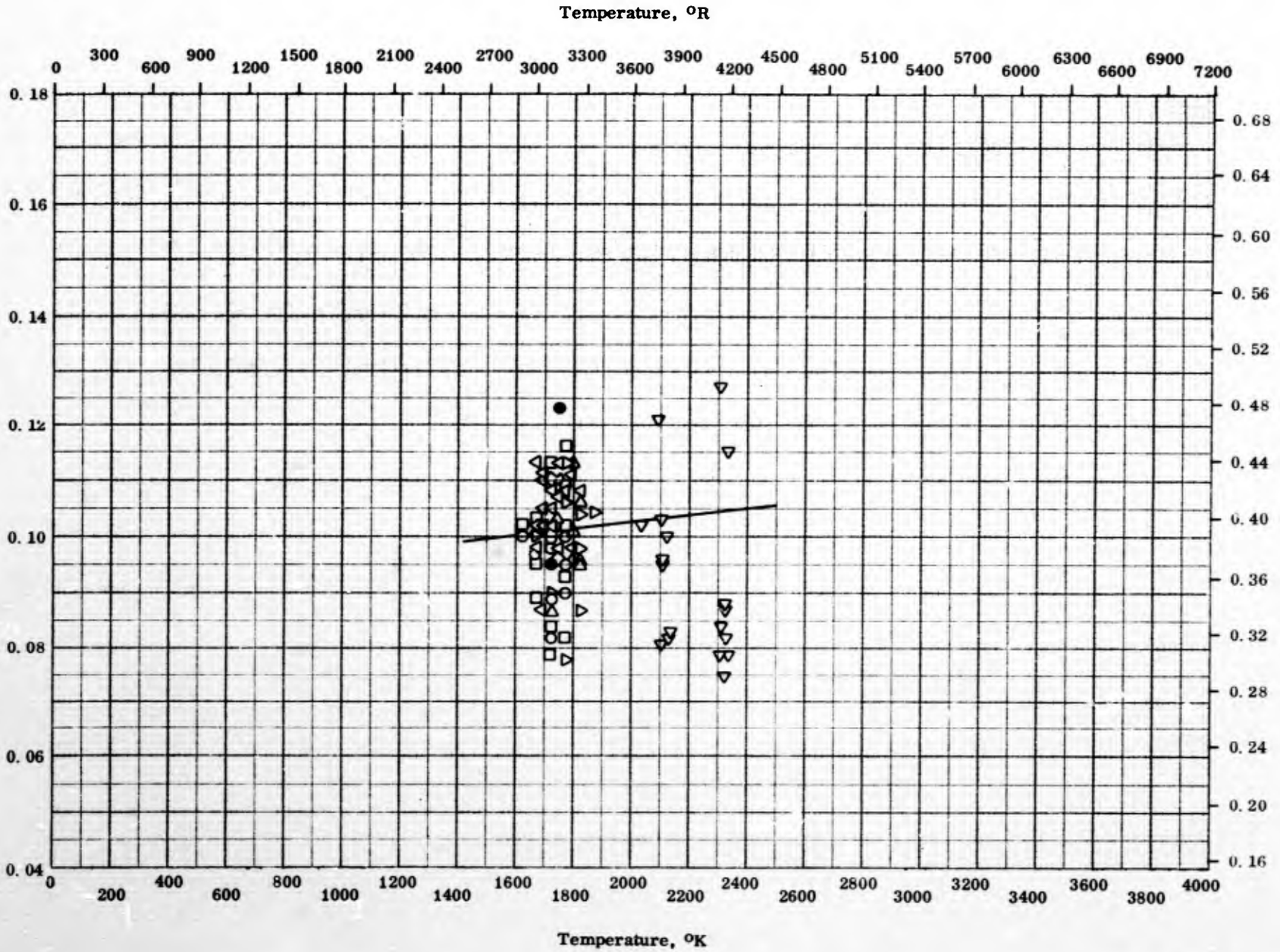
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	54-3	373-1073		80.6 Ti, 19.0 C (cf. theor. 79.9 Ti and 20.1 C), and 0.4 O_2; porosity 4.4%; density 4.06 g cm^{-3}.	Fired at 2000 C.
□	54-3	773-1373		Same except porosity 18.8 and density 3.49 g cm^{-3}.	Same as above.
△	61-1	758-2313	10	0.3 > metallic impurities by chemical analysis; density between 94 to 95% of theoretical value.	Hot-pressed.
◈	62-6	1199-1500	5-7	TiC.	Ground and polished thoroughly; heat-soaked at 4050 F.
◆	62-6	1543-1860	5-7	TiC.	Same as above except sample found cracked on post inspection.
▽	62-6	1892-2668	5-7	TiC.	Ground and polished thoroughly; heat-soaked at 3500 F; sample found cracked on post inspection.
◇	62-6	1121-2460	5-7	TiC.	Same as above except heat-soaked at 3350 F; sample found cracked on post inspection.
▷	62-1	298-773		TiC.	
◁	63-8	303-778		TiC; 80.3 ± 0.3 Ti, 19.3 C, and 0.2 > metallic impurities; single phase; density 4.77 g cm^{-3}; from Carbonrundum Co.	
■	63-8	1673-1873		TiC; 79.2 Ti, 19.5 C, and 0.2 > metallic impurities; single phase; density 4.74 g cm^{-3}; from Norton Co.	
●	63-8	308-823		TiC; 79.6 ± 1.2 Ti, 17.7 C, and 1.4 metallic impurities; single phase; density 4.56 g cm^{-3}.	

(Continued onto next page)

THERMAL CONDUCTIVITY -- TITANIUM CARBIDE (continued)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▲	63-6	1623-1823		TiC; 80.3 ± 0.3 Ti, 19.3 C, and 0.2 > metallic impurities; single phase; density 4.77 g cm^{-3}.	Calculated from radial diffusivity.
▼	63-6	303-773		Same as above.	Calculated from flash diffusivity.
◆	63-6	1673-1873		TiC; 79.2 Ti, 19.5 C, and 0.2 > metallic impurities; single phase; density 4.74 g cm^{-3}.	Calculated from radial diffusivity.
◀	63-6	308-823		TiC; 79.6 ± 1.2 Ti, 17.7 C, and 1.4 metallic impurities; single phase; density 4.56 g cm^{-3}.	Calculated from flash diffusivity.
◆	61-2	673-1473		TiC.	

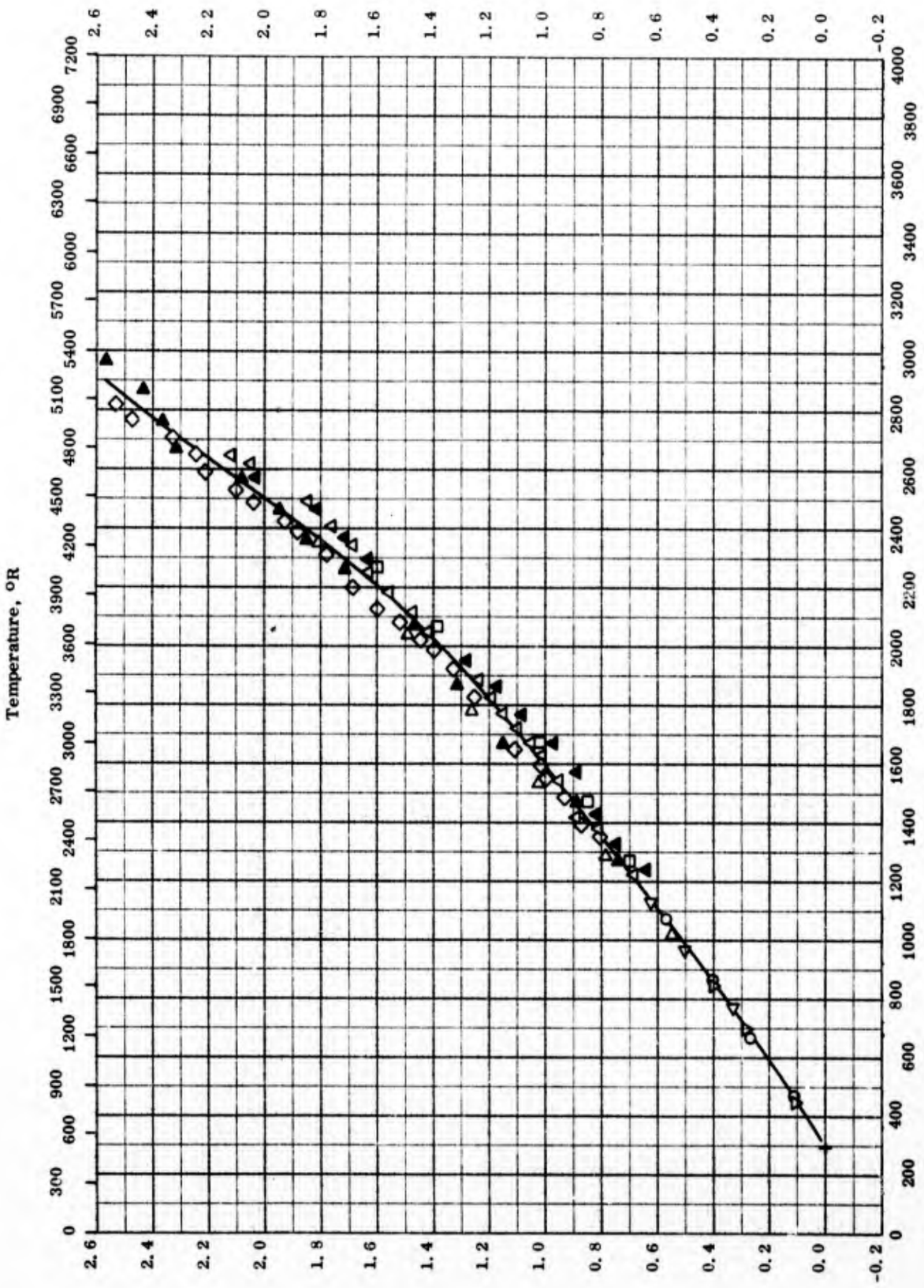


THERMAL DIFFUSIVITY -- TITANIUM CARBIDE

THERMAL DIFFUSIVITY -- TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	62-1	1673-1873		TiC; [Author's design.: B-2].	Machined from a TiC sample; total of six runs.
◁	62-1	1673-1823		TiC; density 4.837 g cm^{-3}. [Author's design.: C-1].	Sample contained sight holes of 0.064 in. in dia and 0.663 in. in depth; total 15 runs.
◇	62-1	1723-1748		TiC; density 4.819 g cm^{-3}. [Author's design.: C-3].	Sample contained 0.046 in. dia drilled holes with a depth of 0.456 in.; total four runs.
□	62-2	1623-1773		79.6 Ti, 19.1 C, and 0.3> metallic impurities by chemical analysis of as-received sample and 79.2 Ti, 19.50 C, and 0.2> metallic impurities by chemical analysis of raw powder; average grain size 50μ; density 4.766 g cm^{-3}.	Total of 19 runs.
○	64-3	1623-1773		Chemical analysis of raw powder: 79.2 Ti, 19.5 C, and 0.2> metallic impurities; chemical analysis of compacts: 80.3± 0.3 Ti, 19.3 C, and 0.2> metallic impurities; average grain size 7(ASTM); density 4.77 g cm^{-3}. [Author's design.: 1].	Hot-pressed.
▽	64-3	1673-2338		Same as above. [Author's design.: 2].	Hot-pressed.
△	64-3	1673-1823		79.2 Ti, 19.12 C, 2 Zr, 0.1 Co, 0.1 Fe, 0.1 Nb, 0.1 Si, 0.1> V, 0.05 Ag, 0.05 Al, 0.05 Cu, 0.03 Ca, 0.03 Mg, and 0.005> B; composition after testing; average grain size 9.5 (ASTM); density 4.84 g cm^{-3}.	
●	64-3	1723-1746		77.8 Ti and 19.5 C; average grain size 9.5 (ASTM); density 4.82 g cm^{-3}.	Hot-pressed.



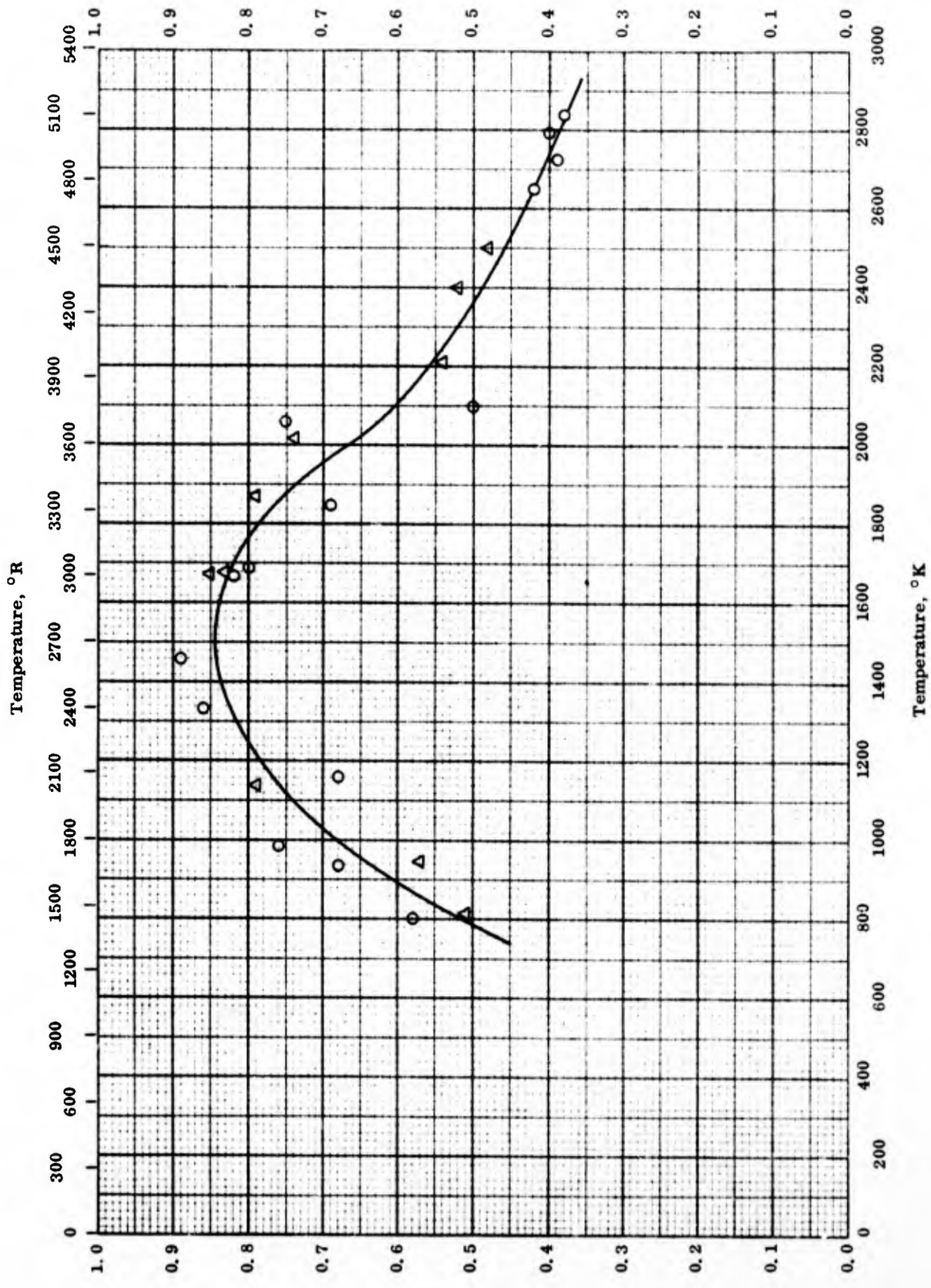
THERMAL LINEAR EXPANSION -- TITANIUM CARBIDES

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- TITANIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	63-32	298-2353		$TiC_{0.95}$; 79.35 Ti, 19.05 C (0.15 free C), 0.67 N, 0.10 Fe, 0.035 O, and 0.021 Al; total impurity 0.98; total analysis 99.23.	Prepared by pressing powder of less than 6 microns diameter at 18000 psi and heating in vacuum to 1500 C for 1 hr; data obtained from (422) and (511/333).
◁	58-7	296-1121		$TiC_{0.921}$ from Powder Metallurgy Section, Los Alamos Scientific Lab.; 79.7 Ti and 20.0 C (1.6 free C).	X-ray diffraction method.
▶	64-14	293-2965		TiC, Aerospace Corp.; C/Ti ratio of 0.73 in TiC phase; prepared from nuclear grade titanium sponge (0.0165 H) and AGOT carbon (approx 15 wt% initial melt).	Vacuum arc cast, pulverized to <100 mesh, ground to 325 mesh, made into a slurry of 0.1 g powdered carbide with 0.5 ml binder (Duco cement and acetone 1:20 by volume), and dried; measured with x-ray diffractometer aligned on (111) reflection in helium.
△	58-8	313-2645		TiC; density 4.70 g cm^{-3}. [Author's design: Sample No. DI-2]	Hot pressed; measured in argon; first run.
▲	58-8	1241-2645		Same as above.	Cooling cycle for above sample; first run.
◇	58-8	365-2833		Same as above. [Author's design: Sample No. DI-2]	Second heating cycle for above sample; second run.
□	58-8	293-2673		TiC; density 4.70 g cm^{-3}. [Author's design: Sample No. DI-1]	Hot pressed; measured in argon.
○	54-9	296-1293		19.23 total carbon, 0.24 free carbon.	X-ray diffraction method.
▽	50-8	293-867		17.07 combined carbon and 2.76 free carbon; density 295.8 lb ft^{-3}.	Hot pressed in graphite mold; heating rate during test 4 C min^{-1}.

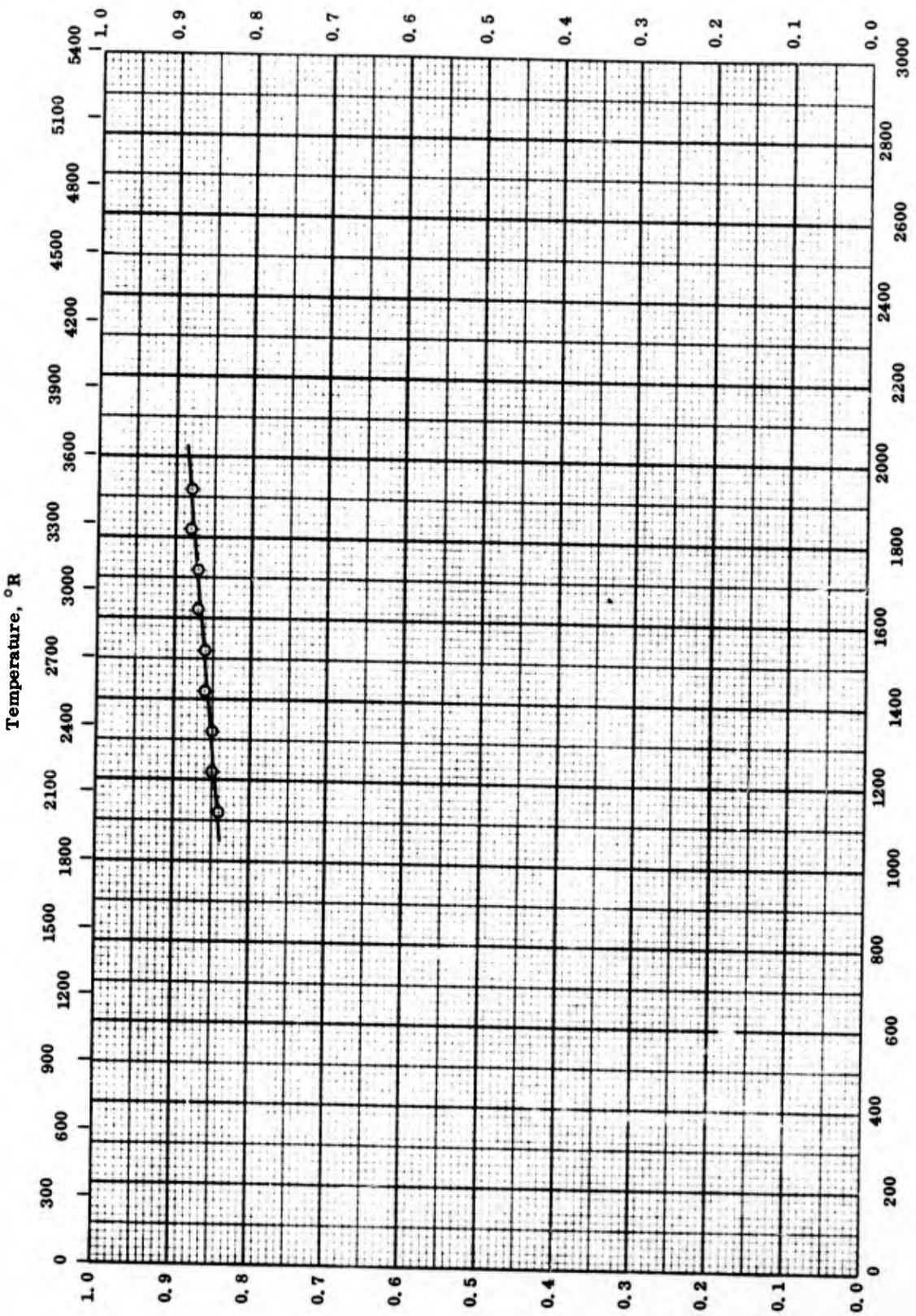


NORMAL TOTAL EMITTANCE -- TITANIUM CARBIDE

NORMAL TOTAL EMITTANCE -- TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	799-2838	10	TiC, density 4.77 g cm^{-3}.	Hot pressed; measured in argon; first run.
Δ	62-6	813-2500	10	Same as above.	Same as above; second run.



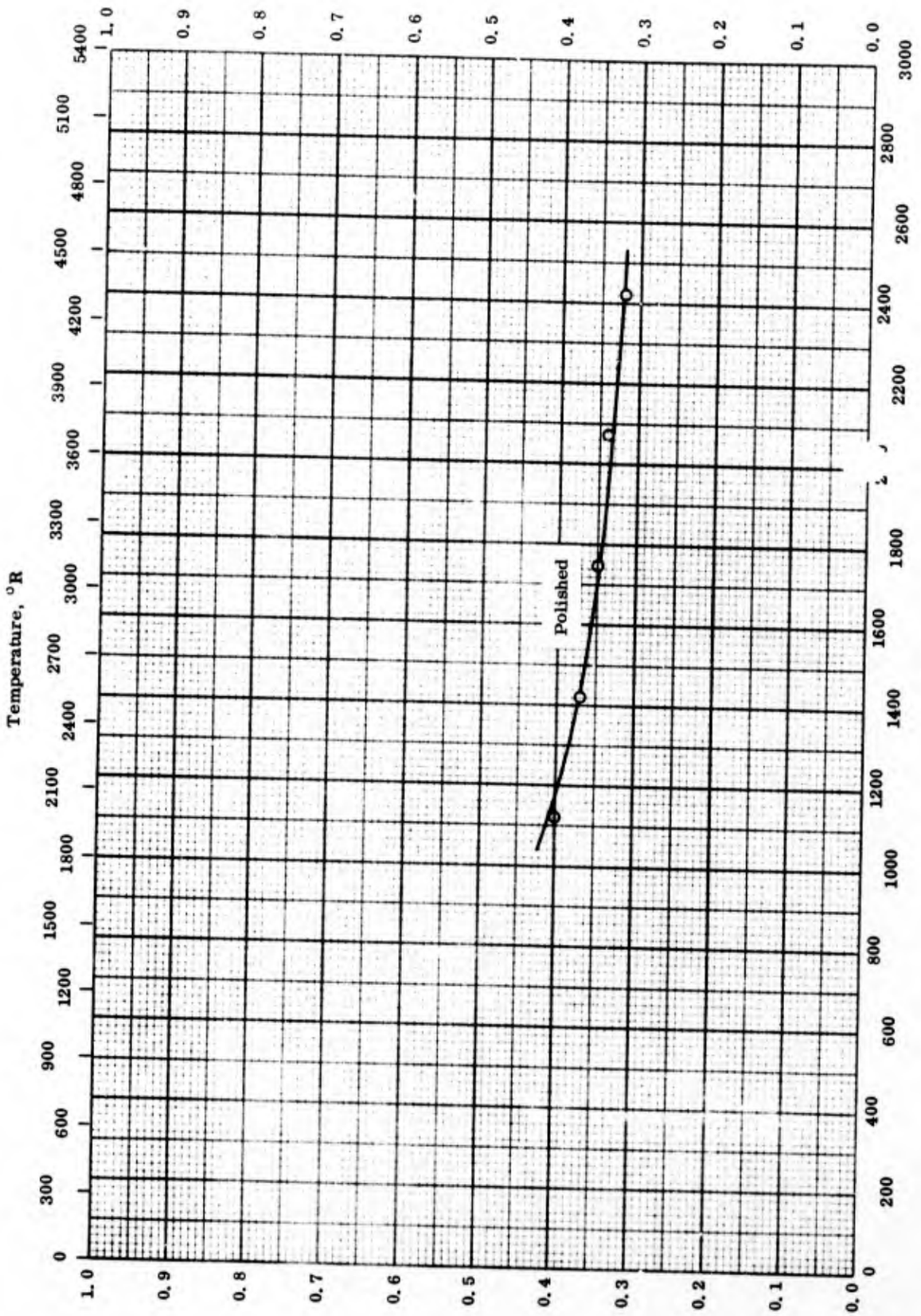
NORMAL SPECTRAL EMITTANCE -- TITANIUM CARBIDE

TPRC

NORMAL SPECTRAL EMITTANCE — TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-12	0.65	1123-1923		TiC from powder of 2 – 3 μ size; homogeneous layer ~ 100 μ thickness.	Layer of paste on tantalum cylinder, prepared from powder by suspending in nitrate binder; dried at 320 K.



ANGULAR SPECTRAL EMITTANCE -- TITANIUM CARBIDE

ANGULAR SPECTRAL EMITTANCE -- TITANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range $^{\circ}$K	Rept. Error %	Sample Specifications	Remarks
O	60-14	0.5-0.6	1125-2425		TiC, slice cut from a single crystal parallel to cleavage plane.	Highly polished; measured in argon of 1 atm.; 45° from normal.

PROPERTIES OF TUNGSTEN CARBIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
	WC	15.63*	975.8*
Melting Point		K	R
○	WC	3143**	5658**
□	WC	2993	5387
△	WC	2906	5231
▽	W_2C	3003± 15**	5405± 27**
◇	W_2C	2973	5351

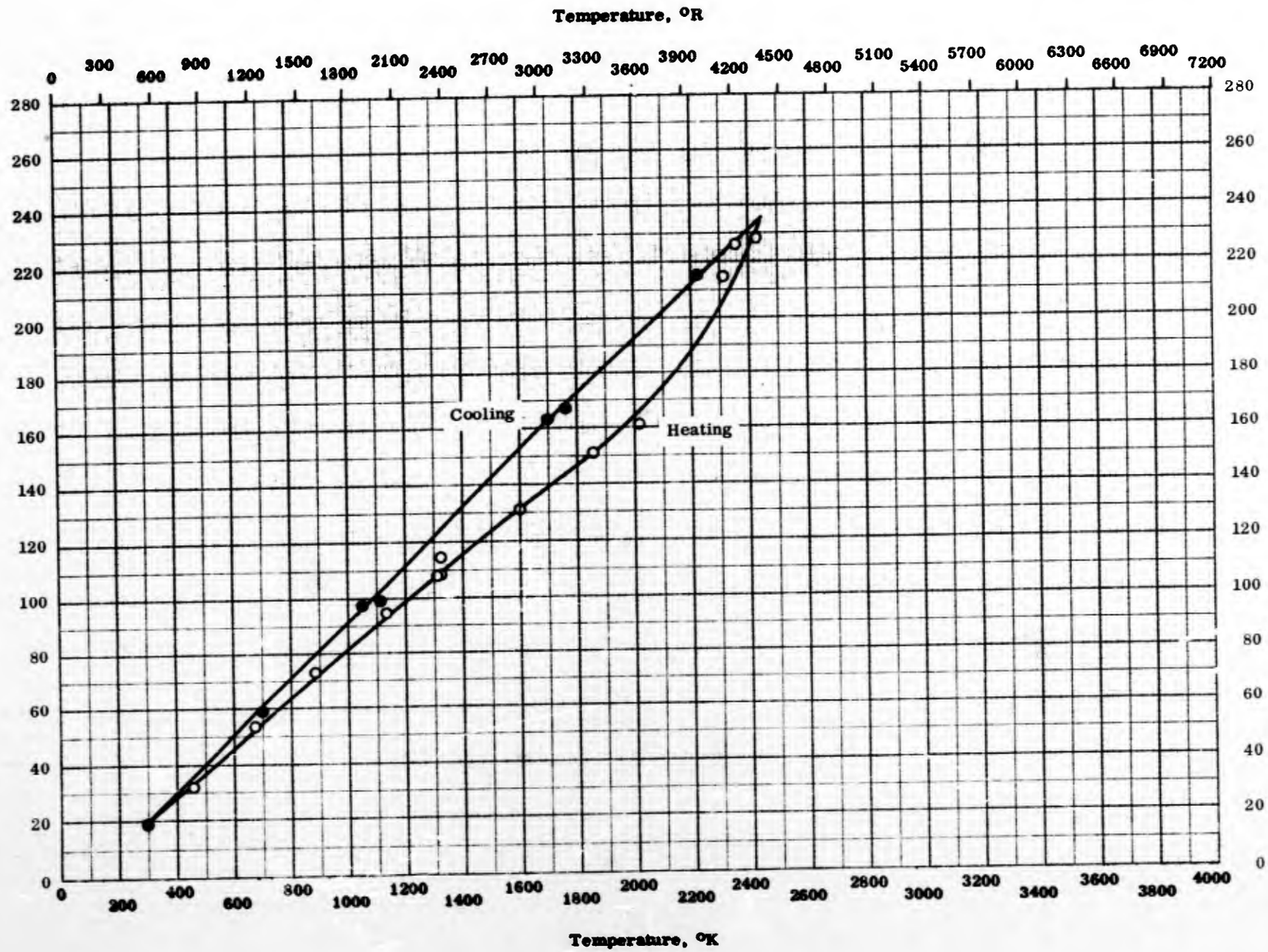
*Handbook of Chemistry and Physics (Ref. 64-13)

**Most probable value for this compound

PROPERTIES OF TUNGSTEN CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	3143		WC	
□	60-24	2993		WC	
△	60-8	2906		WC	
▽	57-21	2988-3018		W_2C	
◇	60-8	2973		W_2C	



ELECTRICAL RESISTIVITY -- TUNGSTEN CARBIDE

Electrical Resistivity, ohm cm x 10⁶

ELECTRICAL RESISTIVITY -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

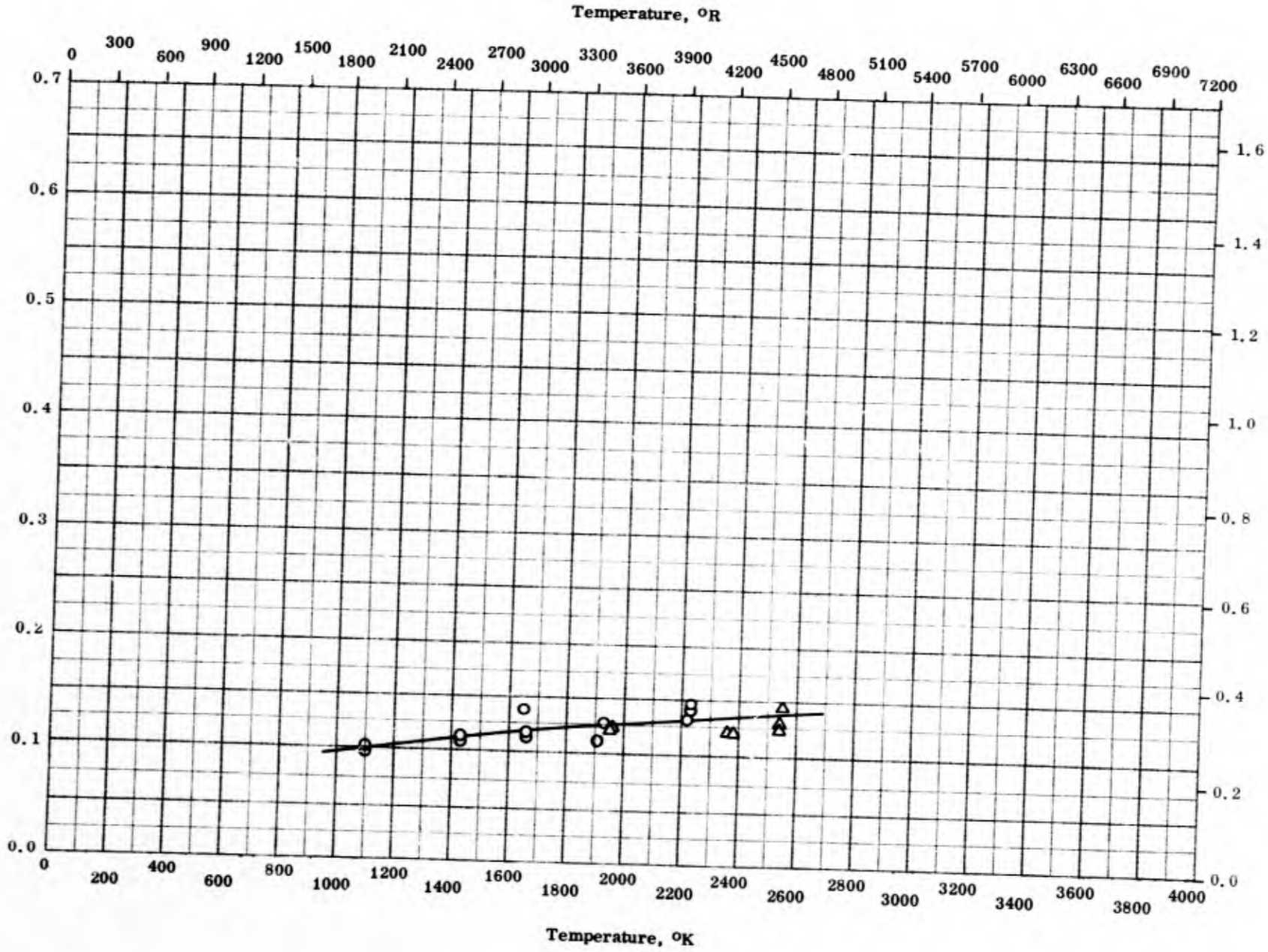
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	297-2433	2.4	93.9 W, 6.15 C, and 0.1> N.	Hot pressed; max. exposure temperature 4960 F.
●	62-6	294-2433	2.4	Same as above.	Cooling curve of the above sample.

SPECIFIC HEAT -- TUNGSTEN CARBIDE

SPECIFIC HEAT -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	533-2755	≤5.0	WC; before test: 93.9 W, 6.15 C, 0.4 Fe, 0.3 Si, and 0.1 >N_2; density 942 lb ft^{-3}; after test: 94.1 W, 5.95 C, and 0.1 > N_2; density 918 lb ft^{-3}.	Hot pressed and crushed in hardened steel mortar to pass 100-mesh screen.

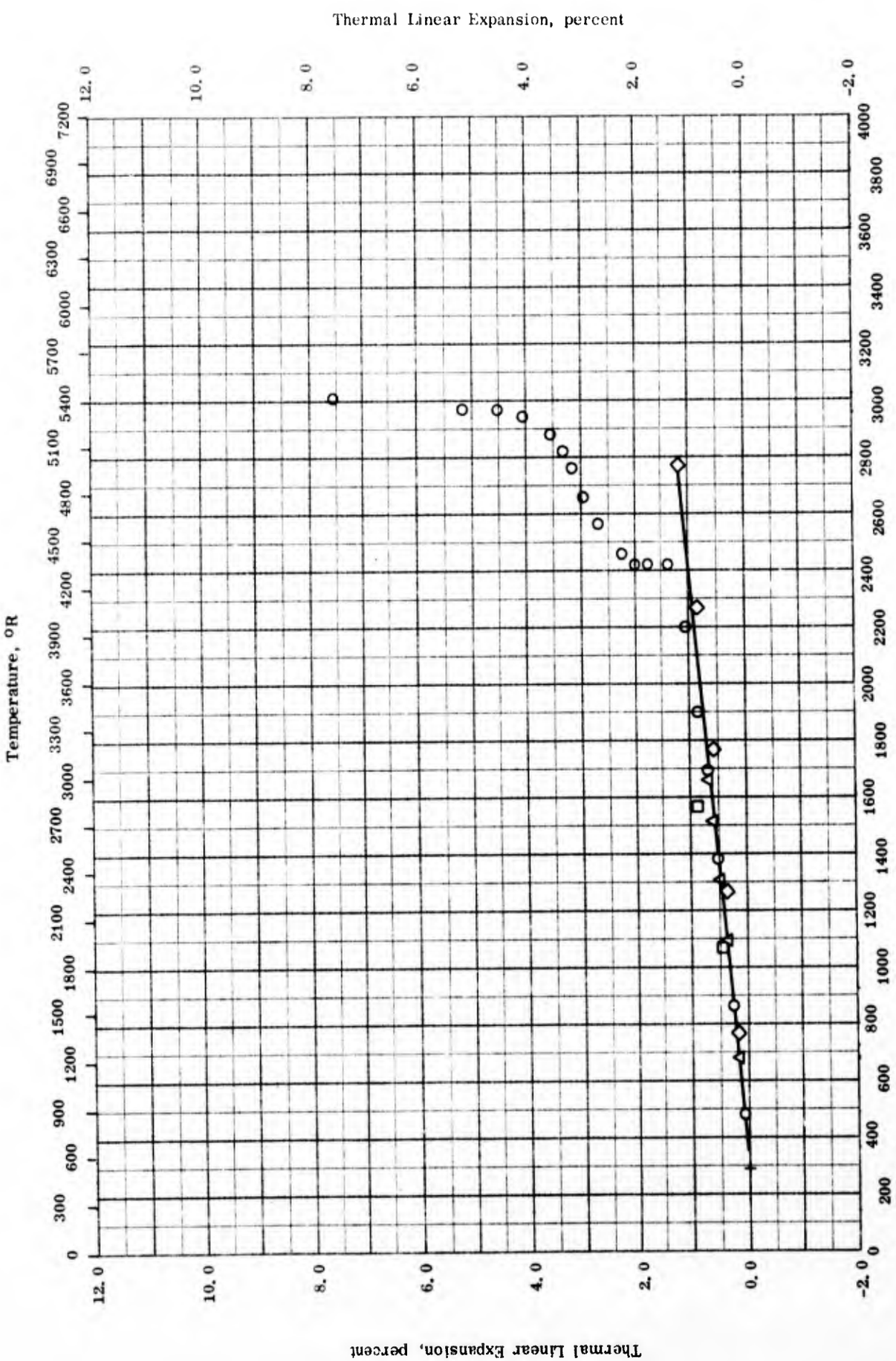


THERMAL CONDUCTIVITY -- TUNGSTEN CARBIDE

THERMAL CONDUCTIVITY -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	1103-2227	5-7	WC.	Ground and polished thoroughly; heat-soaked at 3875 F; sample found cracked on post inspection.
Δ	62-6	1948-2547	5-7	WC.	Same as above except heat-soaked at 3650-3700 F; sample found cracked on post inspection.

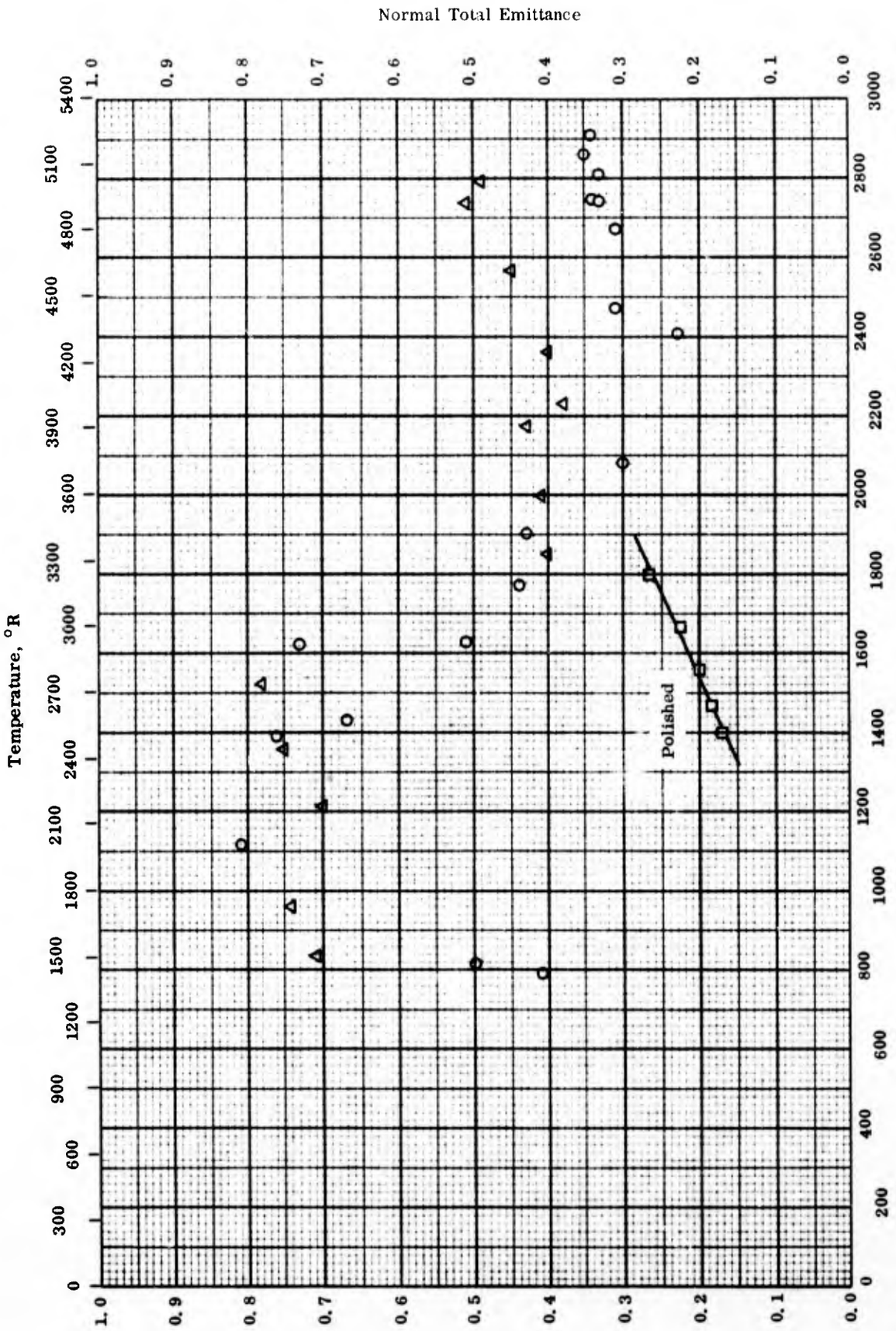


THERMAL LINEAR EXPANSION -- TUNGSTEN CARBIDES

THERMAL LINEAR EXPANSION -- TUNGSTEN CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	294-3011	5	WC from Carborundum Co.; 93.9 W, 6.15 C, and <0.1 N; elements found by semi-quantitative emission spectrography before exposure 0.3 Si and 0.4 Fe; after exposure 94.1 W, 5.95 C, and <0.1 N; density in g cm^{-3} at 25 C by ASTM method B 311-58 before exposure 15.0, after exposure 13.1; initial length 2.232 in., final length 2.365 in. [Author's design; Kun No. E 4]	Hot pressed; measured in helium; incipient melting evident on post inspection; photomicrographs taken after exposure revealed considerable rearrangement of carbide phase with migration to grain boundaries and changes in the dispersion size and shape.
◇	60-23	298-2773		W_2C.	
□	52-5	293-1573		Not given.	
△	55-11	273-1670		6.07 C (cf. theor. 6.13 C), 0.01-0.1 Si, 0.001-0.01 each Ca, Cr, Fe, Mg, and 0.0001-0.001 Cu.	Sintered; measured in He atm with x-ray diffraction.

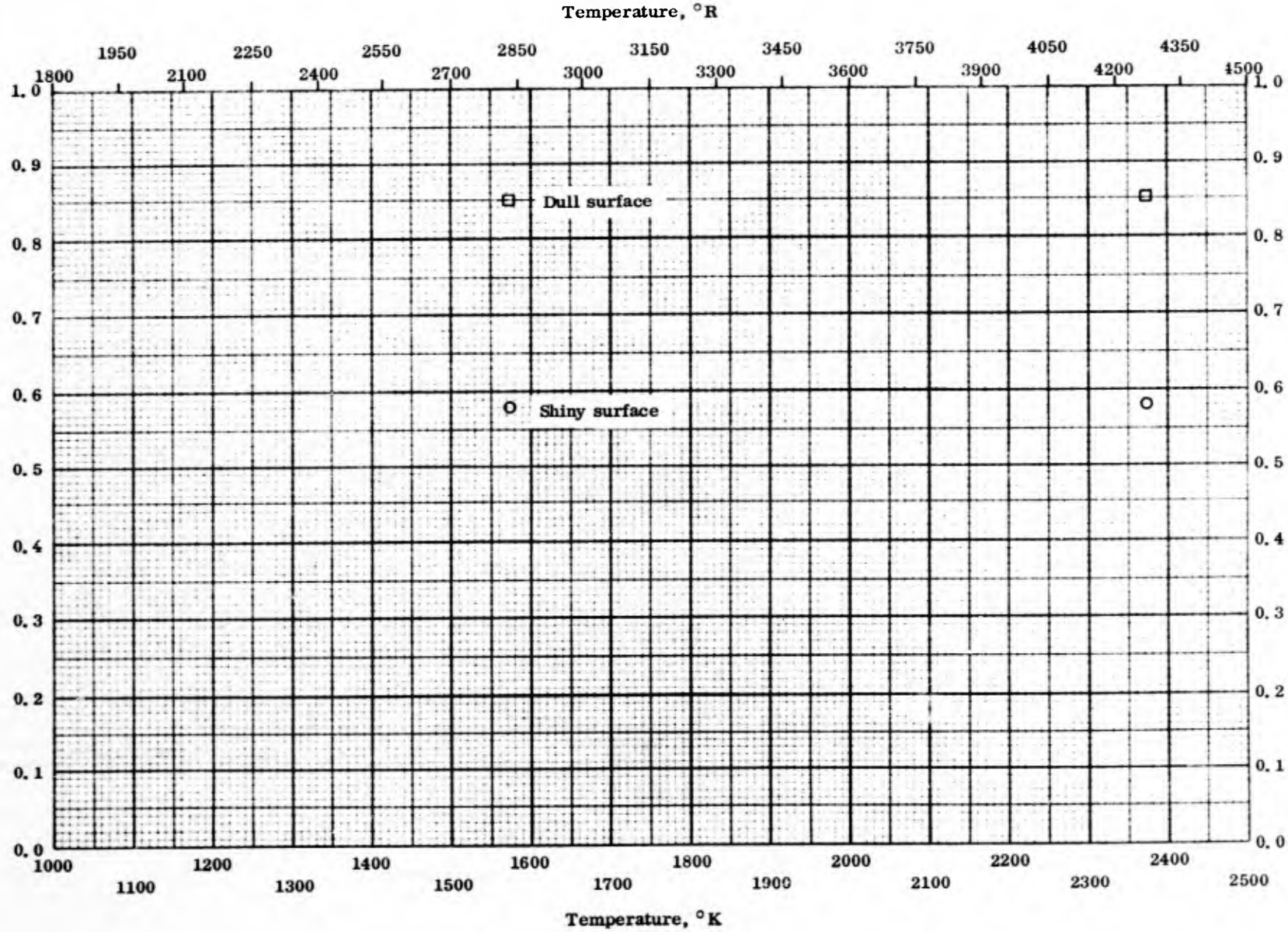


NORMAL TOTAL EMITTANCE -- TUNGSTEN CARBIDE

NORMAL TOTAL EMITTANCE -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	791-2911	10	WC; density 15.1 g cm^{-3}.	Hot pressed; measured in argon atmosphere; first run.
□	62-6	838-2794	10	Same as above.	Same as above; second run.
△	63-16	1400-1800		WC.	Polished to optically smooth surface with Nos. 240, 400 and 600 grit carbide papers, finished by using silk cloth and felt cloth with Linde A compound; washed; measured in argon atmosphere at 1.5 atm; computed from spectral data; data taken from smooth curve.



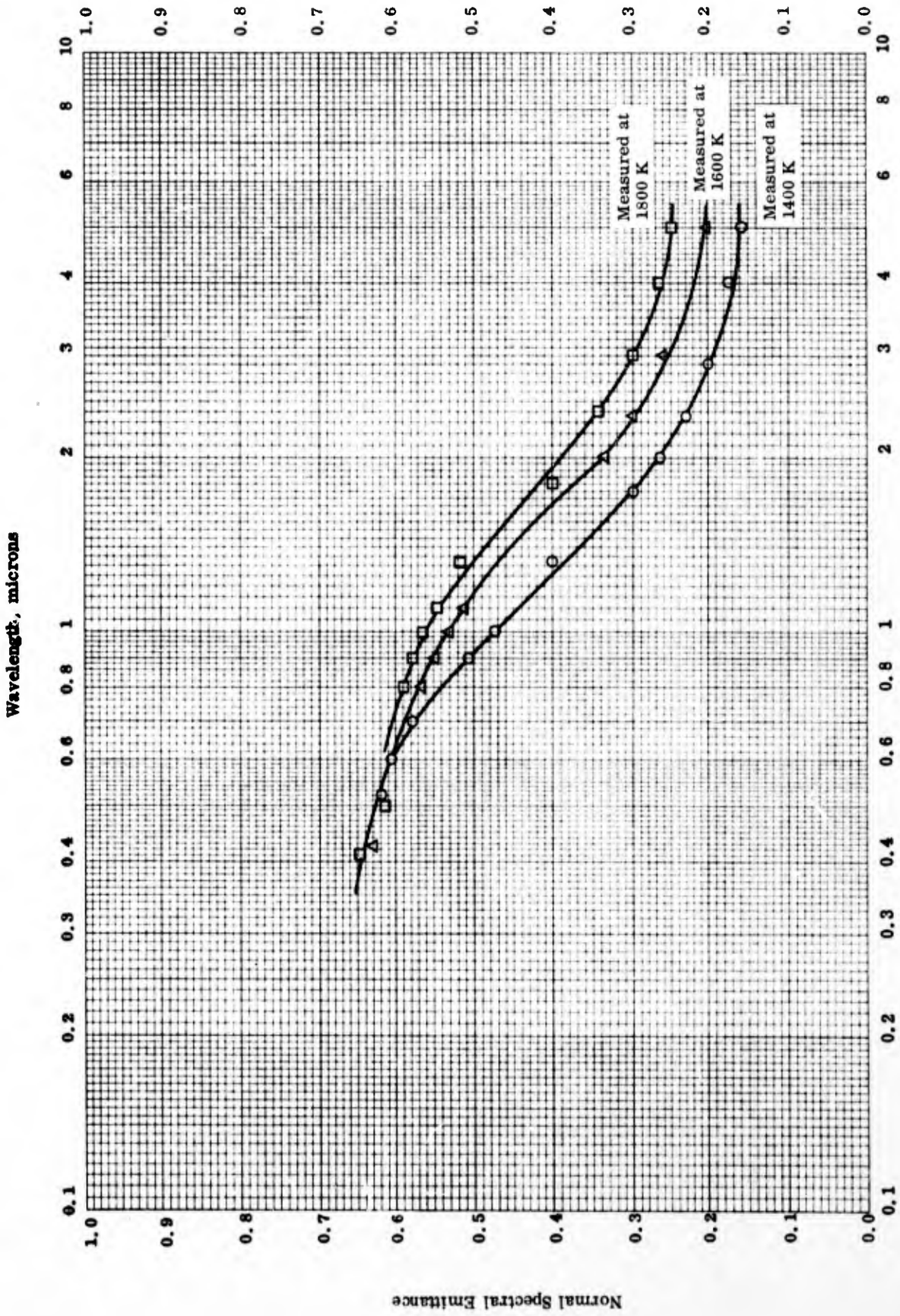
Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- TUNGSTEN CARBIDE

NORMAL SPECTRAL EMITTANCE -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range K	Rept. Error %	Sample Specifications	Remarks
○	61-8	0.65	1573-2373		WC.	Shiny (ground) surface.
□	61-8	0.65	1573-2373		WC.	Dull surface.

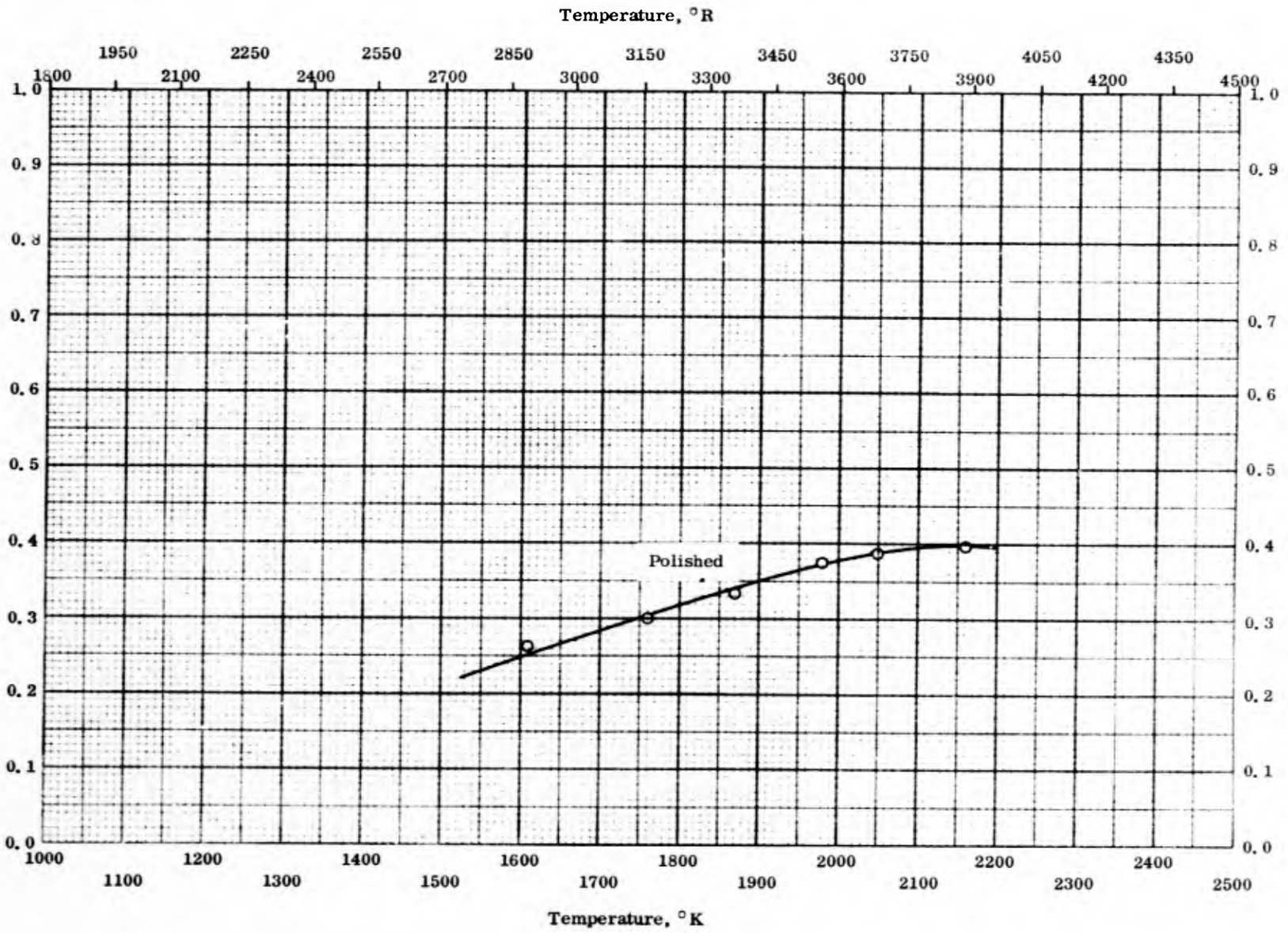


NORMAL SPECTRAL EMITTANCE -- TUNGSTEN CARBIDE

NORMAL SPECTRAL EMITTANCE -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-16	1400	0.52-5.0		WC.	Polished to an optically smooth surface by using Nos. 240, 400 and 600 grit carbide papers, finished by using silk cloth and felt cloth with Linde A compound; washed and dried; measured in argon atmosphere at 1.5 atm; data taken from smooth curve.
△	63-16	1600	0.42-5.0		Same as above.	Same as above.
□	63-16	1800	0.41-5.0		Same as above.	Same as above.



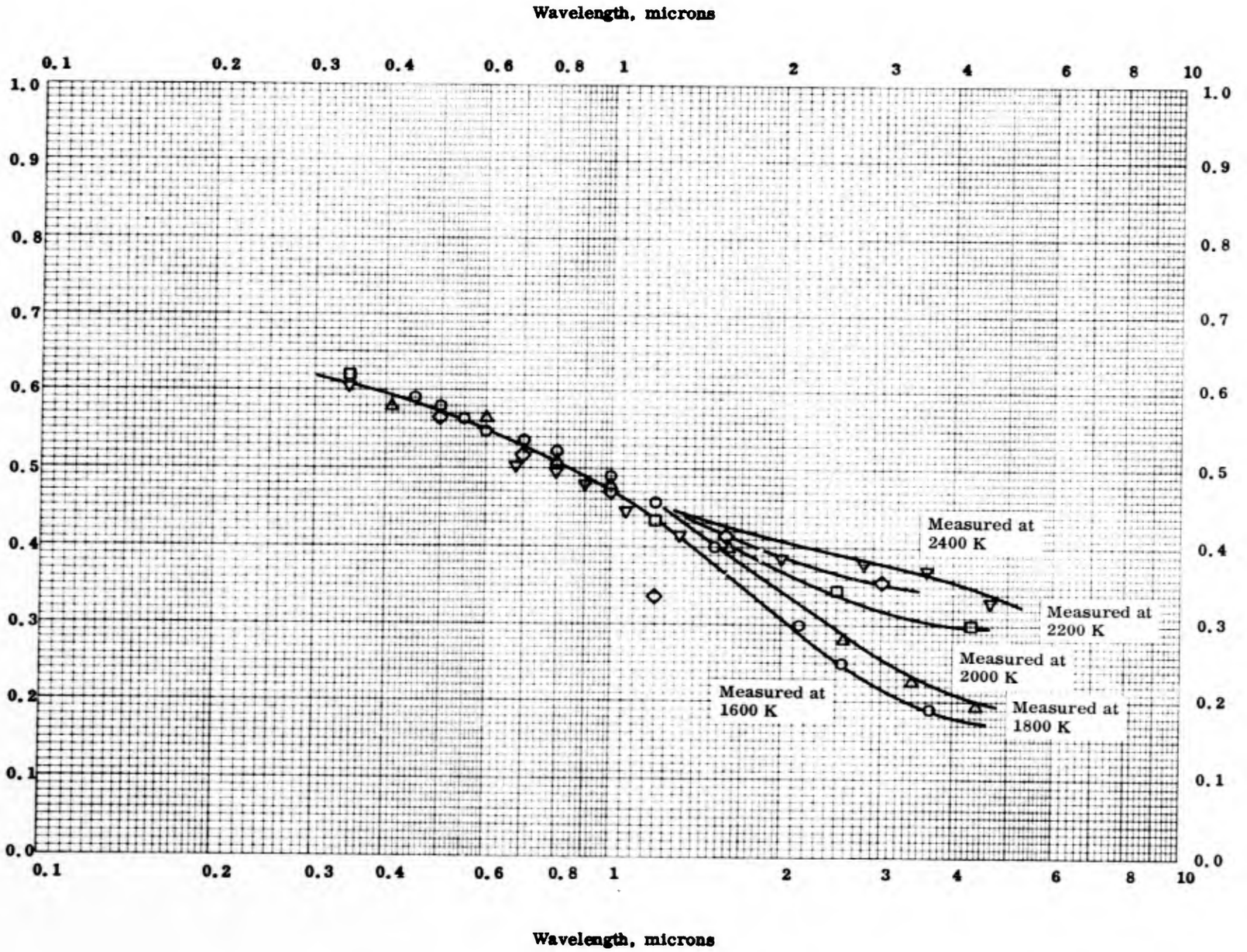
Normal Total Emittance

NORMAL TOTAL EMITTANCE -- DITUNGSTEN CARBIDE

NORMAL TOTAL EMITTANCE -- DITUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-16	1610-2400		W_2C.	Polished to an optically smooth surface by using carbide paper Nos. 240, 400 and 600 grit; washed and dried; measured in argon at 1.5 atm; data taken from smooth curve and computed from spectral data.

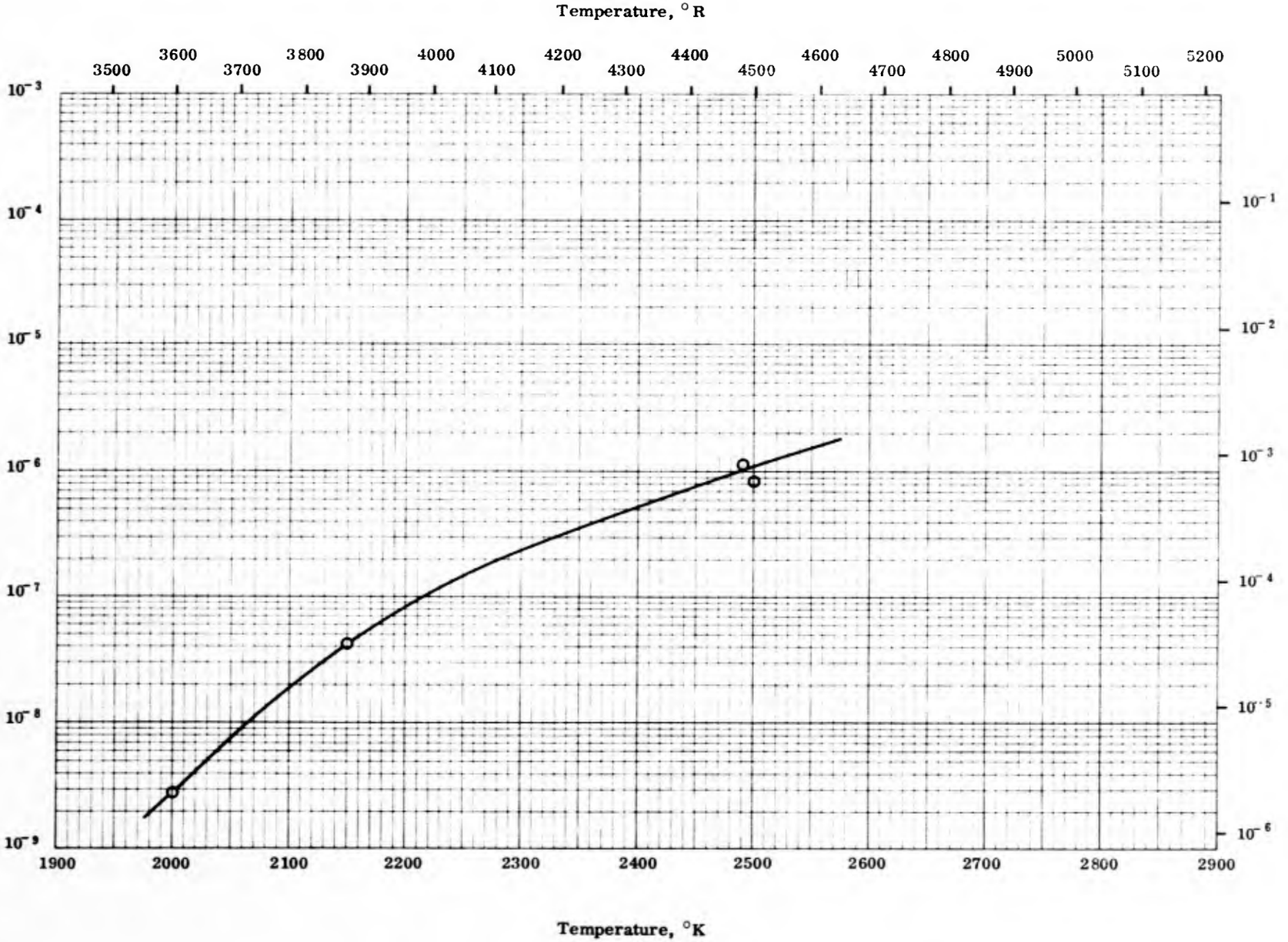


NORMAL SPECTRAL EMITTANCE -- DITUNGSTEN CARBIDE

NORMAL SPECTRAL EMITTANCE -- DITUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-16	1600	0.46-3.65		αW_2C.	Polished to an optically smooth surface by using carbide paper Nos. 240, 400 and 600 grit; washed and dried; measured in argon at 1.5 atm; data taken from smooth curve.
△	63-16	1800	0.41-4.40		Same as above.	Same as above.
□	63-16	2000	0.34-4.30		Same as above.	Same as above.
◇	63-16	2200	0.34-4.40		Same as above.	Same as above.
▽	63-16	2400	0.34-4.65		Same as above.	Same as above.



VAPOR PRESSURE -- TUNGSTEN CARBIDE

VAPOR PRESSURE -- TUNGSTEN CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-1	2001-2501		Not given.	Pressure of carbon over tungsten carbide.

PROPERTIES OF URANIUM CARBIDES

REPORTED VALUES

Density:		g cm^{-3}	lb ft^{-3}
□	UC	13.63	850.9
△	U_2C_3	11.68	729.2
◇	U_2C_3	12.7 ± 0.1*	793 ± 6*
▽	U_2C_3	12.88	804.1

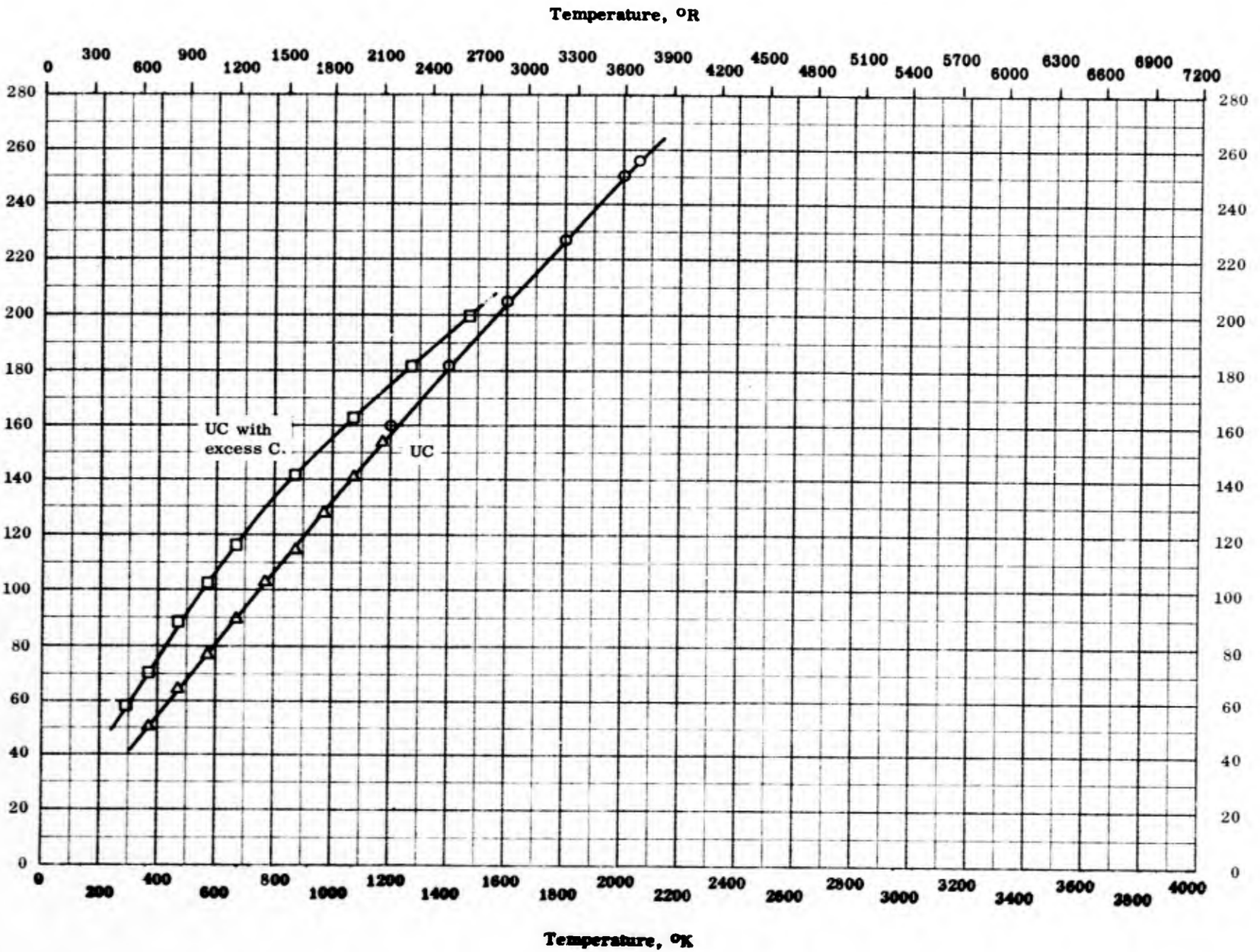
Melting Point:		K	R
○	UC	2860 ± 50	5150 ± 90
◁	U_2C_3	2650 ± 25	4765 ± 45
▷	UC_2	2700	4860

*Most probable value for this compound.

PROPERTIES OF URANIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	52-7	2813-2913		UC	Prepared by passing H_2 over U and C to form UH_3, which was heated 10 hrs at 825 C, and by heating to 1600 C in graphite crucible to produce UC; author computed density 13.63 g cm^{-3} from lattice measurement of others; M. P. by visual observation.
□	48-6	298		UC	Density computed from x-ray measurement of lattice.
△	48-6	298		U_2C_3	Same as above.
◁	48-6	2622-2672		U_2C_3	
◇	50-11	298		U_2C_3	
▽	50-11	298		U_2C_3	Density computed from x-ray measurement of lattice.
▷	45-3	2700		UC_2	



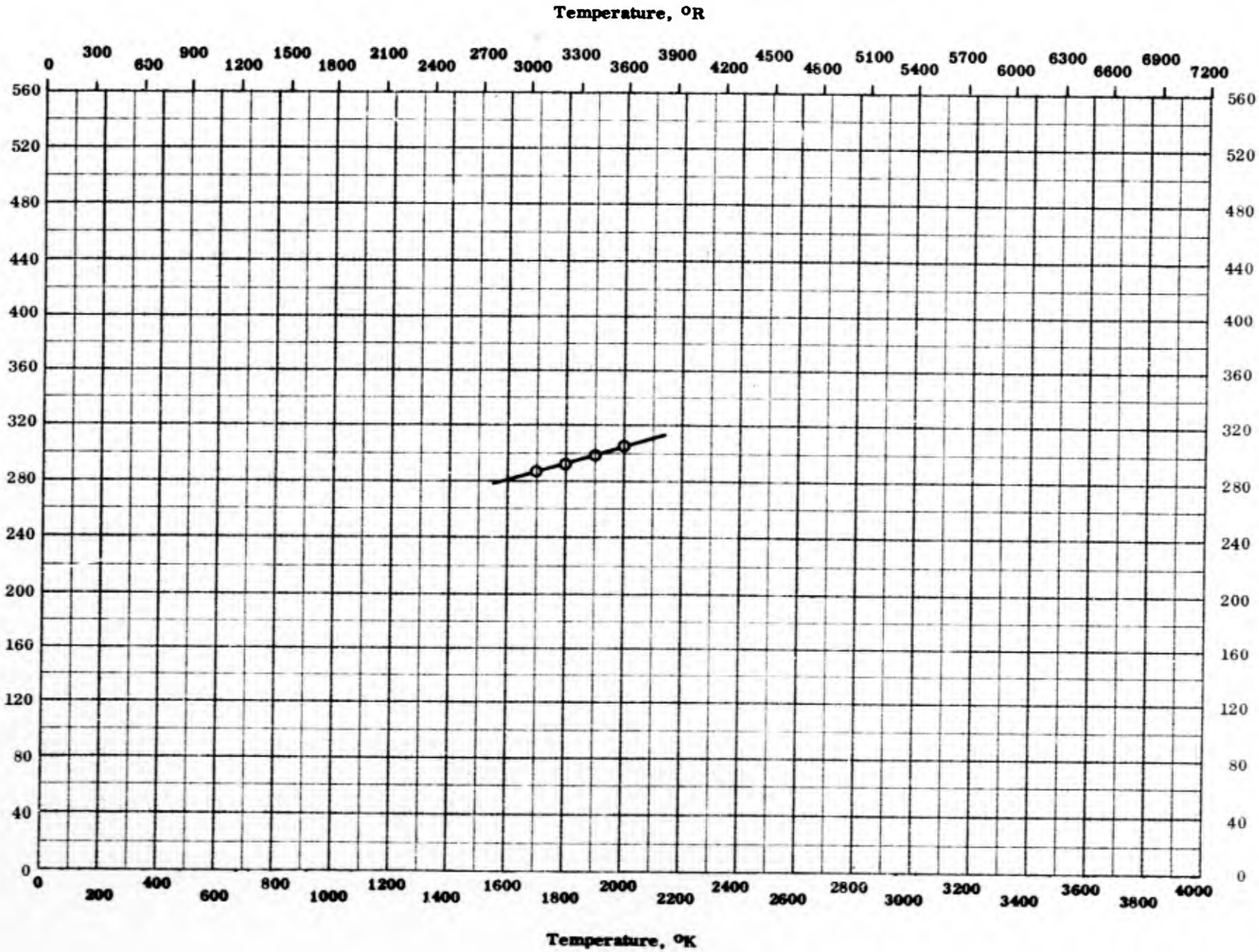
Electrical Resistivity, ohm cm x 10⁶

ELECTRICAL RESISTIVITY -- URANIUM MONOCARBIDE

ELECTRICAL RESISTIVITY -- URANIUM MONOCARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-8	1200-2050	± 2.0	UC from BMI; 94.7 uranium and 5.3 total carbon; oxygen content < 0.02.	
△	64-4	373-1173		UC.	
□	63-4	298-1473		UC pellets from Parsons Co.; 4.8 C, 0.05 N_2, 0.009 O_2, and 0.0002 H_2.	Vacuum melted.

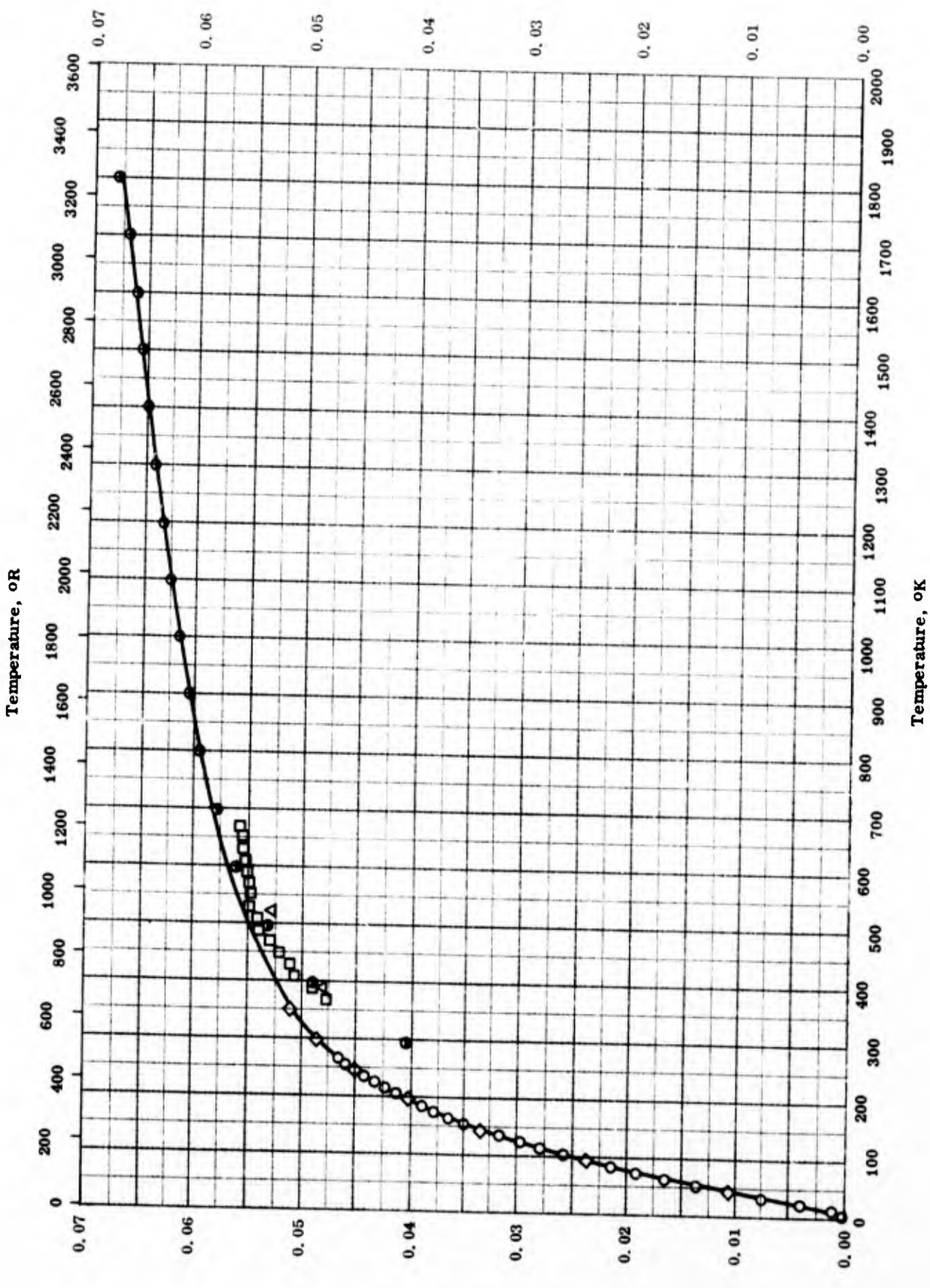


ELECTRICAL RESISTIVITY -- URANIUM DICARBIDE

ELECTRICAL RESISTIVITY -- URANIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-8	1550-2000	±3.0	UC_2; 8.7 total carbon and 0.3 O_2.	Data corrected to 10% porosity.

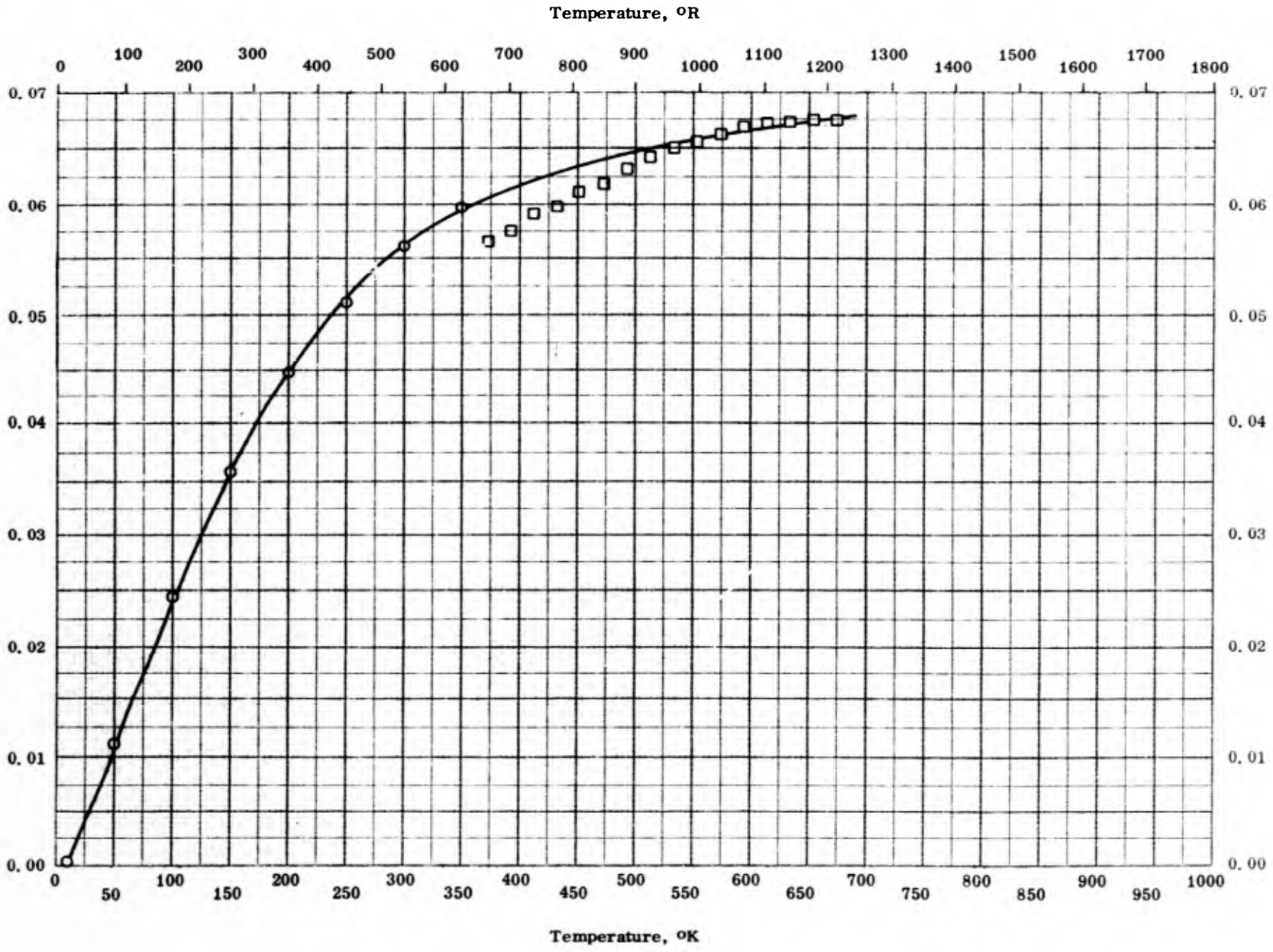


SPECIFIC HEAT -- URANIUM MONOCARBIDE

SPECIFIC HEAT -- URANIUM MONOCARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-3	5-350	0.1-5	UC; 94.16 U, 5.01 total C, and 0.07 free C.	
□	62-17	373-673	3.0	UC; prepared from uranium of composition 99.93 U, 0.044C, 0.0060 Fe, 0.004 Si, 0.0032 N_2, 0.0018 Mg, and 0.00172 Al.	Prepared by solid phase reaction of uranium hydride and carbon at 1100 C for 2 hrs in 10^{-8} mm Hg vacuum.
△	58-2	398-523		UC; 95.185 U, 4.815 total C, and 0.054 free C.	
◇	62-19	10-298		UC; 94.18 U and 5.134 C.	
●	64-7	273-1811	≤4.0	UC; 95.12 U, 4.88 C, 0.0135 O_2, and 0.0060 N_2.	Under helium atmosphere.

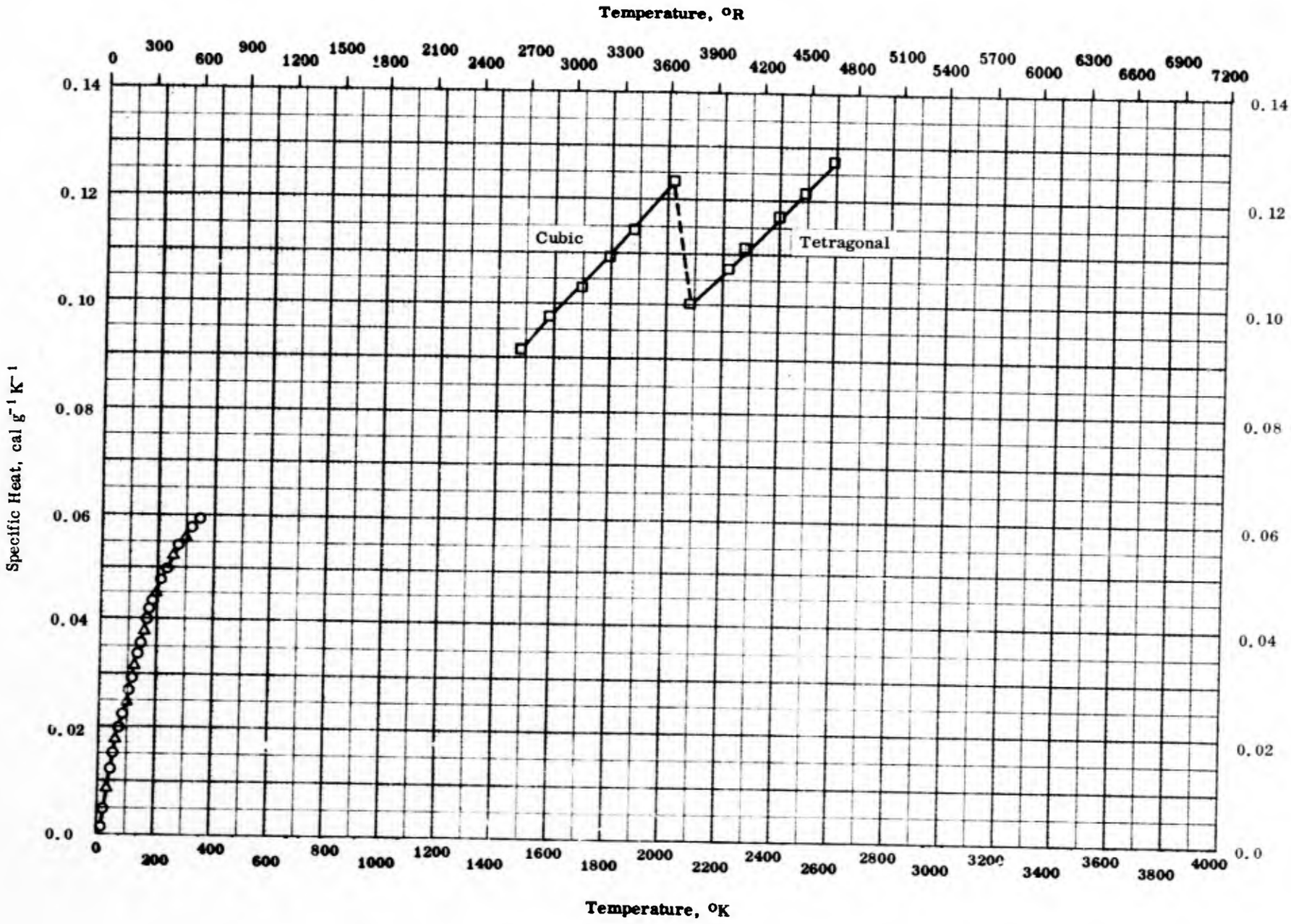


SPECIFIC HEAT -- URANIUM DICARBIDE

SPECIFIC HEAT -- URANIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-19	10-298		UC_2; 90.79 U and 9.20 C.	Under helium atmosphere.
□	62-17	373-673	3.0	UC_2; prepared from uranium of composition 99.93 U, 0.044 C, 0.0060 Fe, 0.004 Si, 0.0032 N_2, 0.0018 Mg, and 0.00172 Al.	Prepared by two step solid-phase reaction of stoichiometric mixture of UH_3 and C at 1100 C for 2 hrs under vacuum; reheated at 1700 C for 2 hrs.

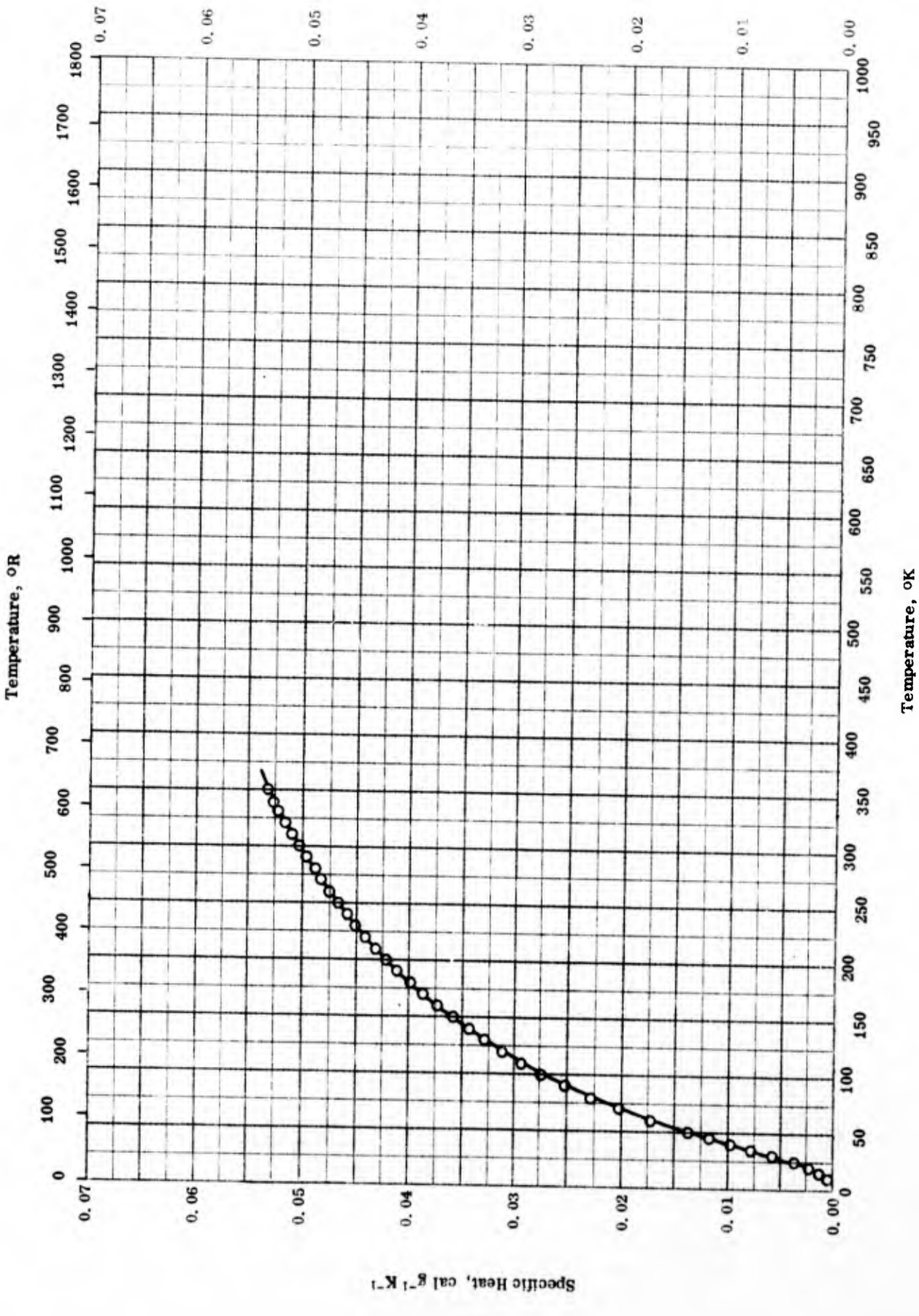


SPECIFIC HEAT -- URANIUM DICARBIDE
(With different carbon content)

SPECIFIC HEAT -- URANIUM DICARBIDE
(With different carbon content)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-2	5-350	0.1-5	$UC_{1.94}$; 91.18 U, 8.91 C, 0.050 free C, and 0.0035 O_2.	
□	63-12	1484-2581	2	$UC_{1.93}$; 90.88 U, 8.9 total C, 0.13 free C, 0.022 O_2.	
△	65-3	5-350	0.1-5	$UC_{1.90}$; 90.79 U, 9.20 total C, 1.0 free C.	

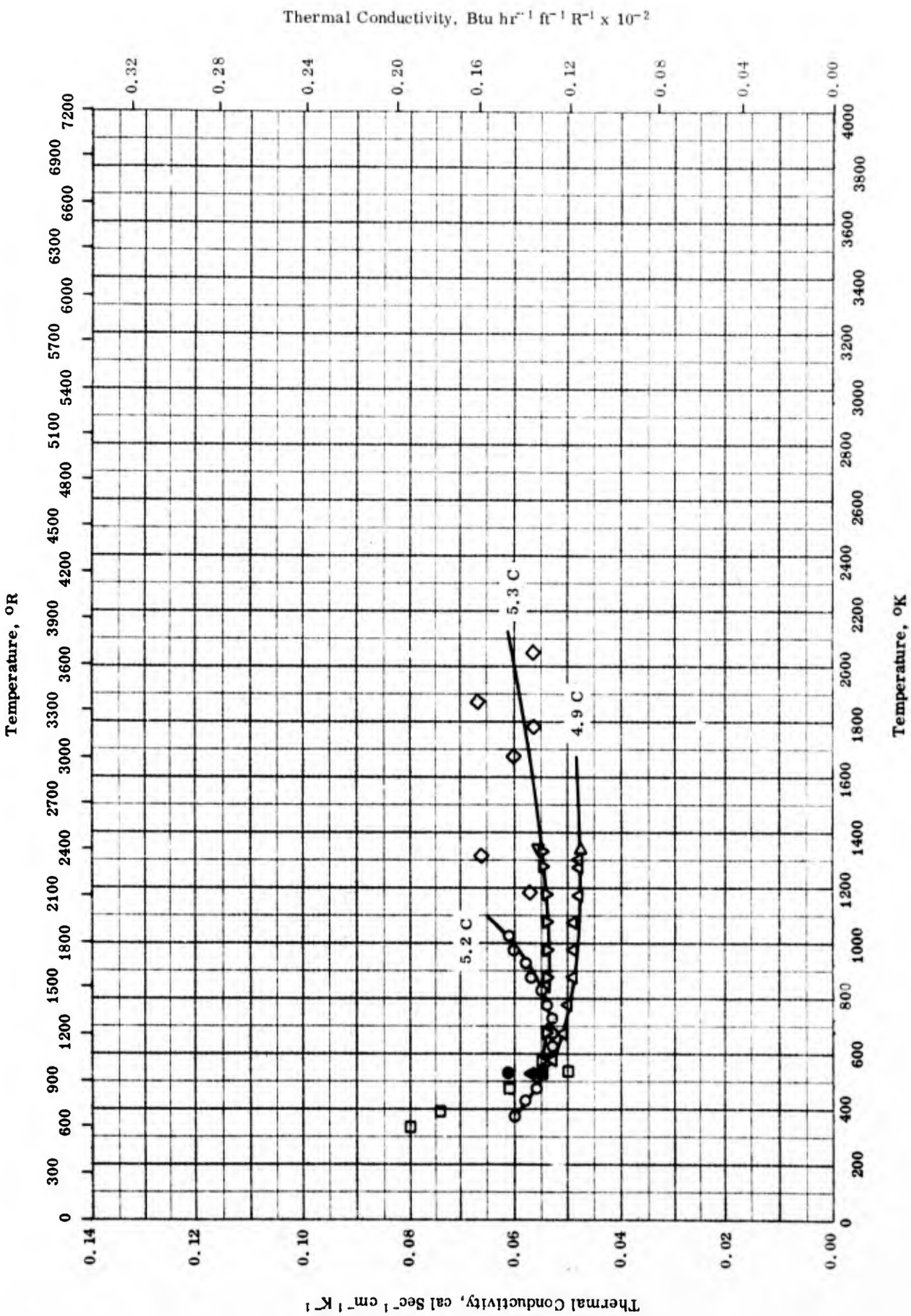


SPECIFIC HEAT -- DIURANIUM TRICARBIDE

SPECIFIC HEAT -- DIURANIUM TRICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	65-2	5-350		U_2C_3; 92.9 U, 6.94 C, 0.050 >free C, 0.003 N_2, and 0.002 O_2.	



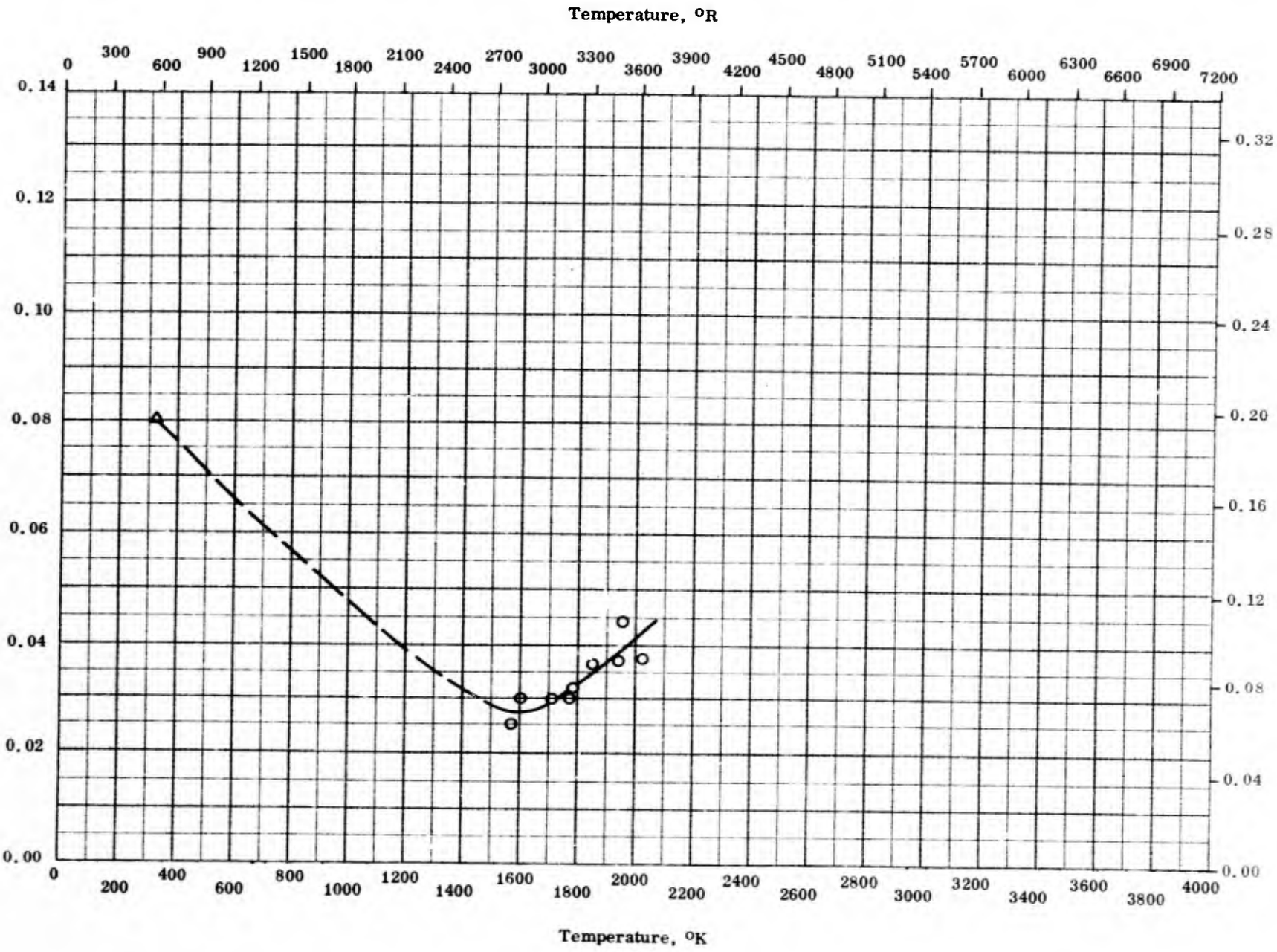
THERMAL CONDUCTIVITY -- URANIUM MONOCARBIDE

TPRC

THERMAL CONDUCTIVITY -- URANIUM MONOCARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	58-2	333-538	< 6	UC; 4.815 ± 0.02 C and 0.054 ± 0.02 free carbon; density 10.20 ± 0.02 g cm^{-3} and pore volume 25%.	Corresponding to about 98 mole % UC, 1 mole % U, and 1 mole % C; sintered.
○	59-2	373-1008		UC; 5.2 C.	Prepared by drop-casting technique.
△	59-3	473-1293	< 5	UC; 4.9 C.	Cast.
▽	59-3	473-1323	< 5	UC; 5.3 C.	Cast.
▷	60-2	572-1339		UC; 4.9 C.	
◁	60-2	572-1339		UC; 5.3 C.	
◇	62-8	1180-2045		UC; 94.7 U, 5.3 C, and 0.02 < O; 100% dense; sample in dry and oxygen-free condition.	Arc-cast and surface polished; measured in a vacuum of about 10^{-6} torr for measurements below 1800 K and in argon at 100 torr above 1800 K.
●	62-7	523	± 5	UC; 4.5 C.	Prepared by drop-casting of arc-melted uranium and chips of nuclear grade graphite in argon at 30 mm Hg pressure.
■	62-7	523	± 5	UC; 4.8 C.	Same as above.
▲	62-7	523	± 5	UC; 5.1 C.	Same as above.

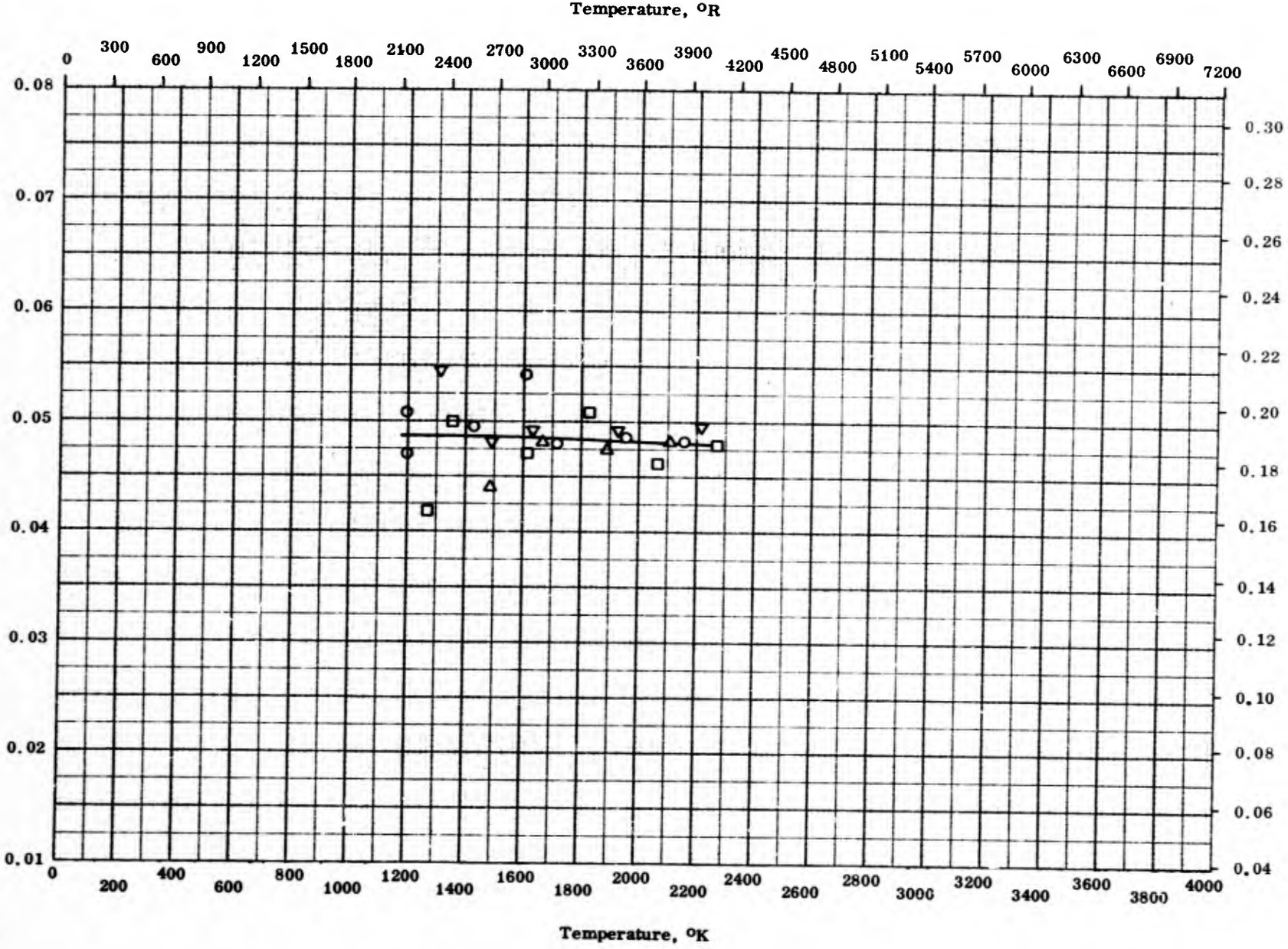


THERMAL CONDUCTIVITY -- URANIUM DICARBIDE

THERMAL CONDUCTIVITY -- URANIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	55-3	323	25	UC_2; glycerine coated.	Hot-pressed for 15 min at about 1700 C and 6000 psi and then rapid cooled from 2150 K; cleaned and polished in a gettered-argon glove box.
○	62-8	1570-2025	20	UC_2; 8.7 C, 1 Ni, and 0.30 O; fairly crystallized with a trace phase of UC present; density 95% - 90% of theoretical 11.7 g cm^{-3}; Ni impurity located at cold end of the sample.	

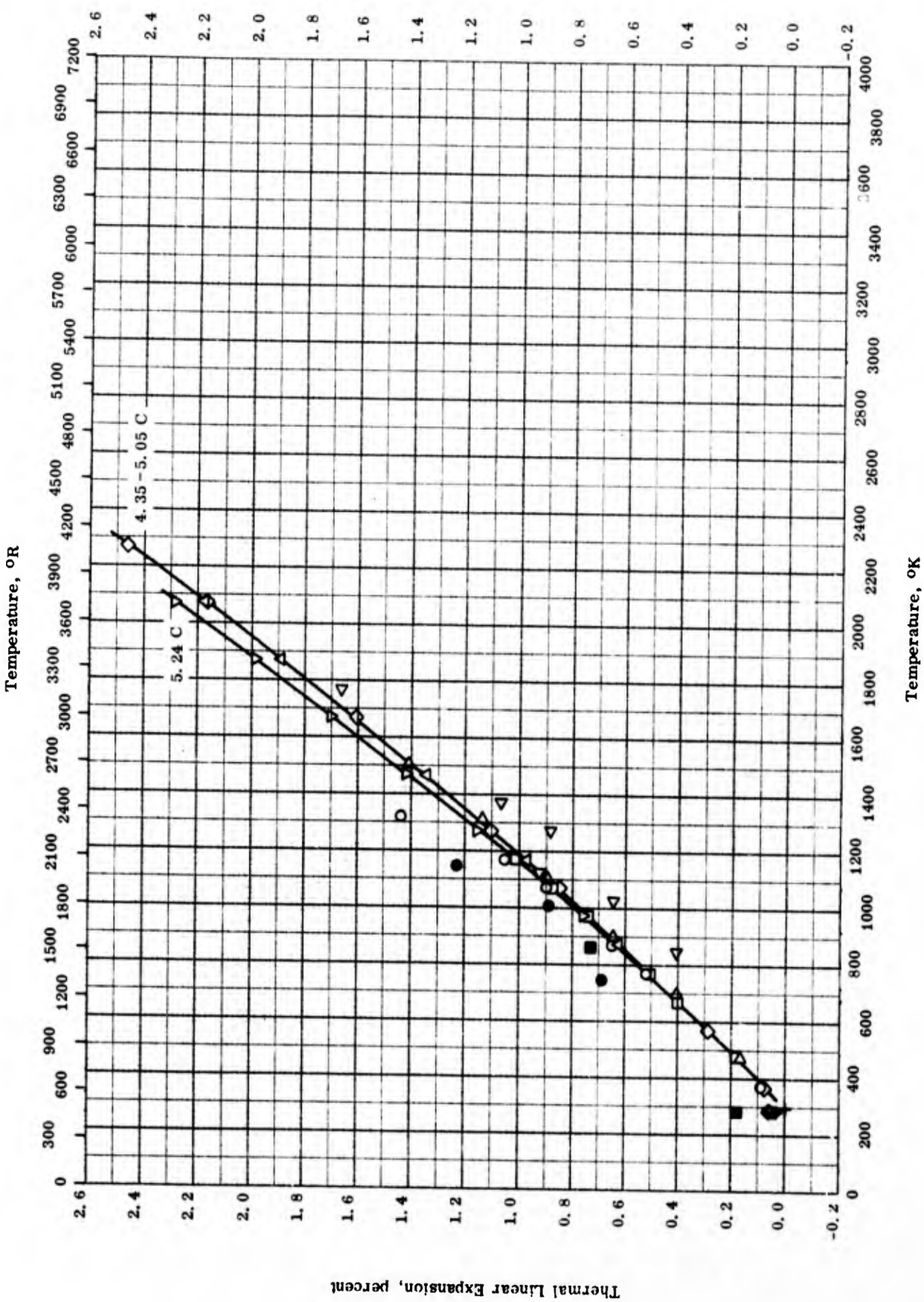


THERMAL DIFFUSIVITY -- URANIUM MONOCARBIDE

THERMAL DIFFUSIVITY -- URANIUM MONOCARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-4	1198-2158		Received as cast condition titled 4.8 C from Parsons Co.; contained 0.05 N_2, 0.009 O_2, and 0.0002 H_2 after preparation; fairly uniform in crystallite size, 10^{-2}cm, and showed tiny speckles of uncombined carbon.	Vacuum melted pellets; spark cut to 1-3 mm thick and electro-sparking planed in a Kerosene bath, then thoroughly washed in acetone before insertion in the vacuum jar for measurements; measured by amplitude method.
□	63-4	1273-2273		Same as above.	Measured by out-put phase shaft method.
△	63-4	1483-2103		Same as above.	Measured by differential phase shaft method.
▽	63-4	1308-2218		Same as above.	Measured by pulse lag method.

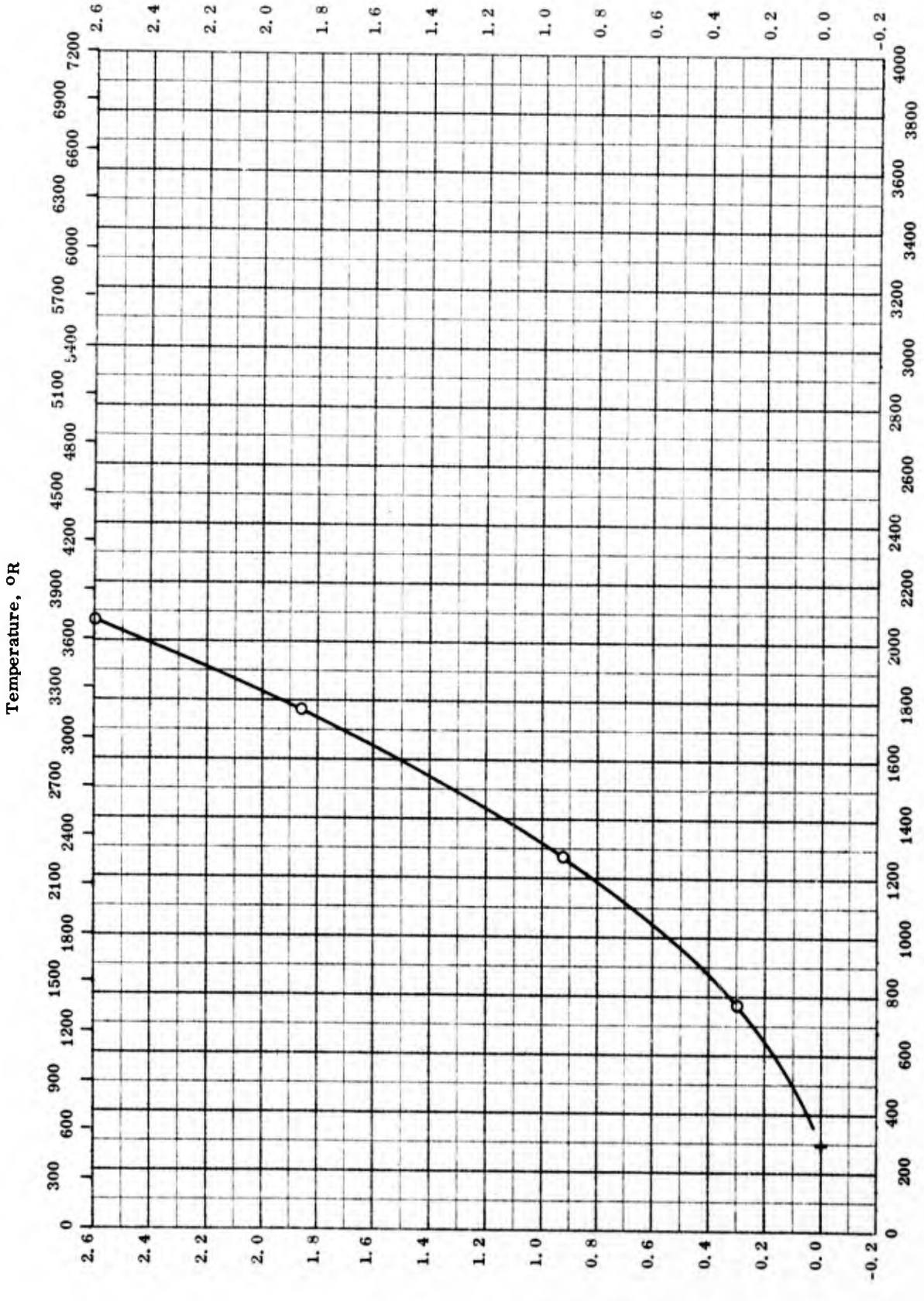


THERMAL LINEAR EXPANSION — URANIUM MONOCARBIDES

THERMAL LINEAR EXPANSION — URANIUM MONOCARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-12	293-1328	1-1.5	UC with 4.35 C; dimensions 0.5 in. dia by 6 in. long.	Arc-cast; measured in helium atm.
●	64-12	743-1328	1-1.5	Same as above.	Cooling cycle for above sample.
□	64-12	293-1173	1-1.5	UC with 4.59 C; dimensions 0.5 in. dia by 6 in. long.	Arc-cast; measured in helium atm.
■	64-12	285-1173	1-1.5	Same as above.	Cooling cycle for above sample.
◇	64-12	293-2273	1-1.5	UC with 4.9 C; dimensions 0.5 in. dia by 6 in. long.	Arc-cast; measured in helium atm.
◆	64-12	285-2273	1-1.5	Same as above.	Cooling cycle for above sample.
△	64-12	293-2273	1-1.5	UC with 5.05 C; dimensions 0.5 in. dia by 6 in. long.	Arc-cast; measured in helium atm.
▲	64-12	285-2273	1-1.5	Same as above.	Cooling cycle for above sample.
▽	64-12	293-2073	1-1.5	UC with 5.24 C; dimensions 0.5 in. dia by 6 in. long.	Arc-cast; measured in helium; data completed subsequent to publication of article and received as a personal communication from authors.
▼	64-12	285-2073	1-1.5	Same as above.	Cooling cycle for above sample.
▷	61-19	298-1523		UC.	Cold pressed at 12000 psi and sintered at 1850 C in vacuum.
◁	61-20	293-1773		Almost stoichiometric UC; small amount of UC_2 present.	Percent expansion calculated from lattice parameters.

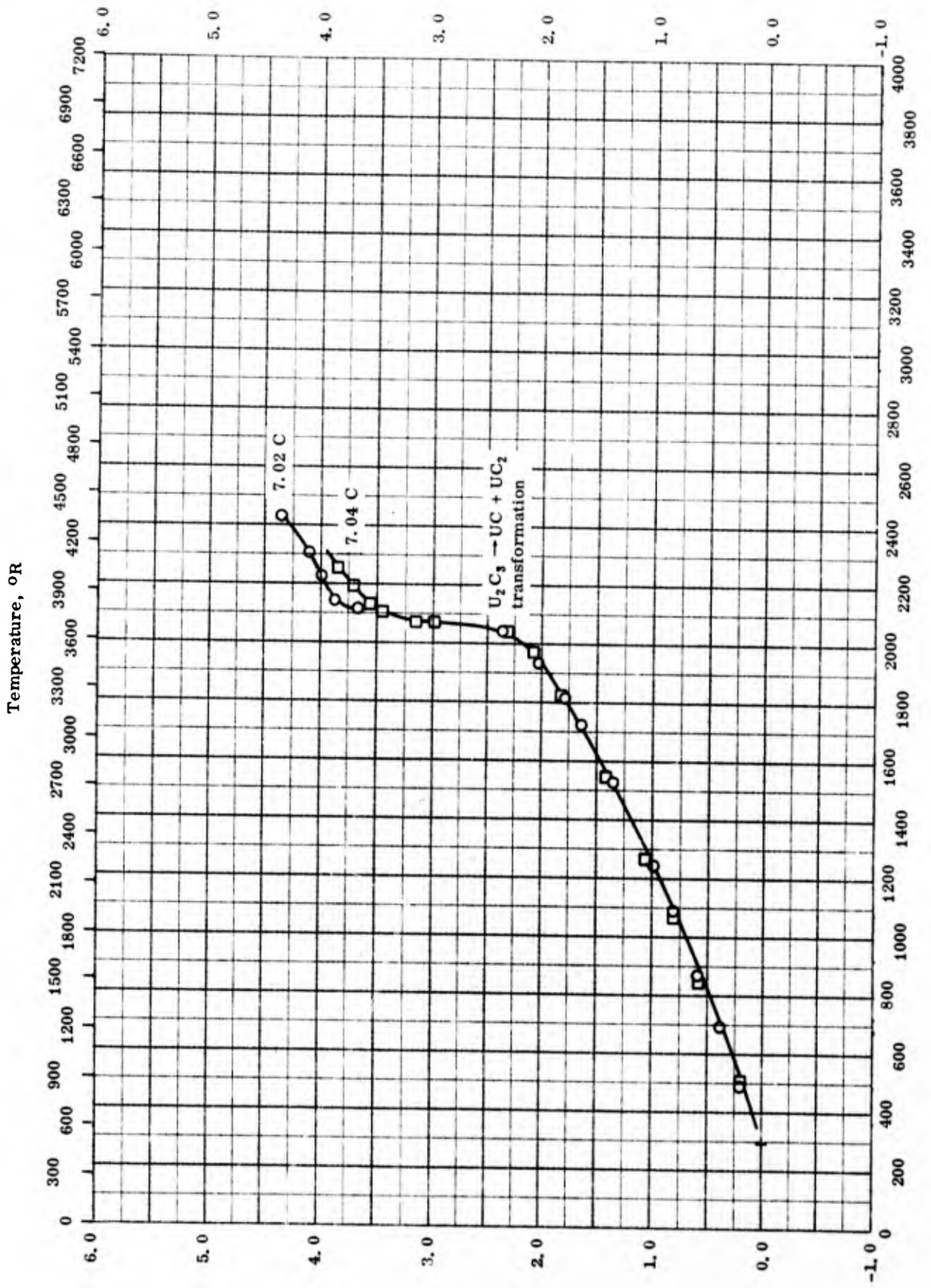


THERMAL LINEAR EXPANSION — URANIUM DICARBIDE

THERMAL LINEAR EXPANSION -- URANIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-23	298-2073		UC_2	

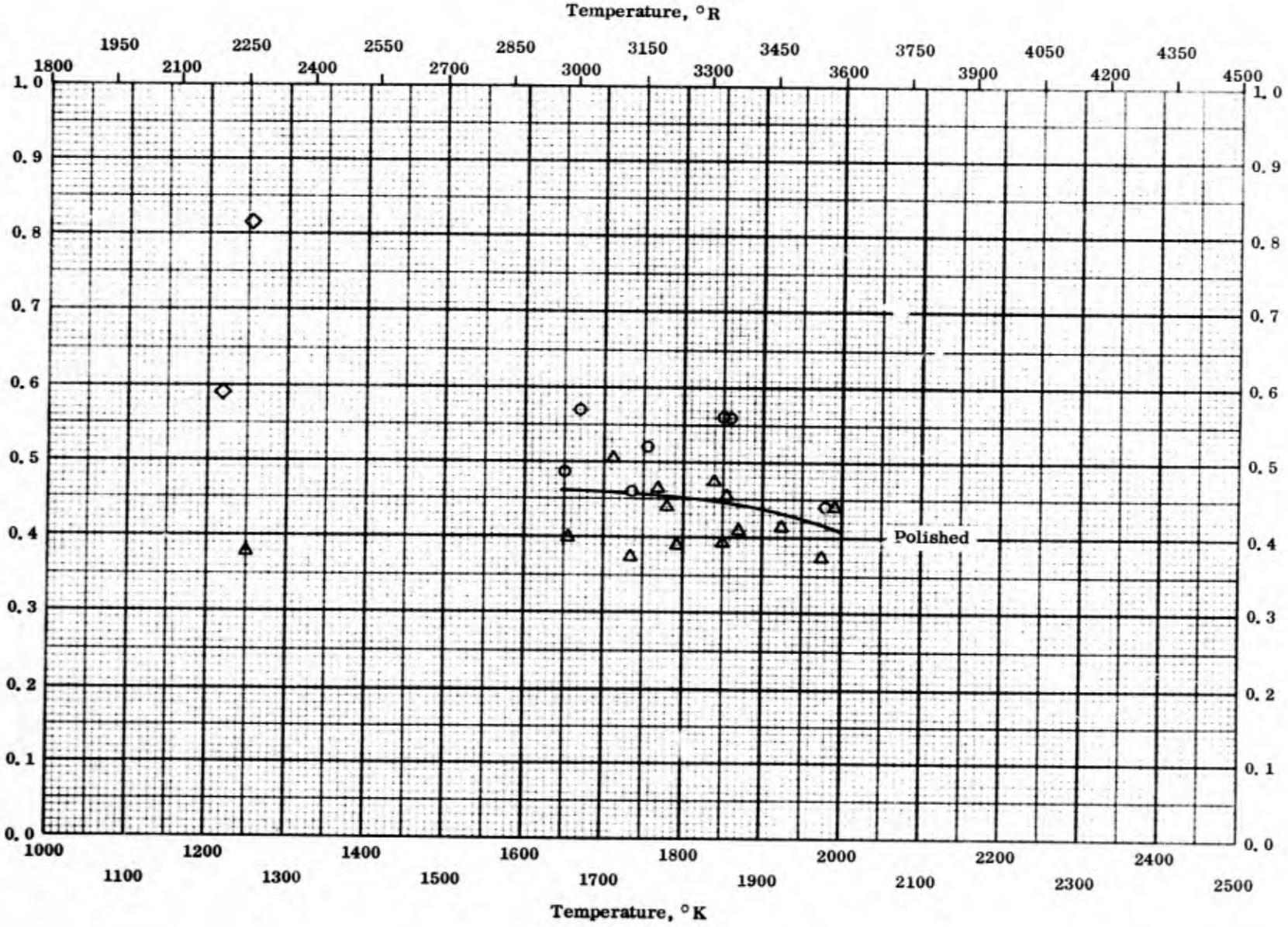


THERMAL LINEAR EXPANSION -- DIURANIUM TRICARBIDE

THERMAL LINEAR EXPANSION — DIURANIUM TRICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-13	293-2433	±2	U_2C_3 with 7.02 C; stoichiometric; dimensions 3/8 in. dia by 5 in. long.	Prepared by arc-casting mixture of UC and UC_2 with 7.0 total C and heat-treating for 6 hrs in vacuum of 10^{-5} mm Hg at 1600 C; measured with heating rate of approx 4 C min^{-1}; sample showed a permanent expansion of about 0.5%; author stated that pronounced expansion at about 1780 C was thought to be caused by $U_2C_3 \rightarrow UC + UC_2$.
□	64-13	293-2253	±2	7.04 C; same as above.	Same as above except used heating rate of approx 0.4 C min^{-1} above 1750 C.

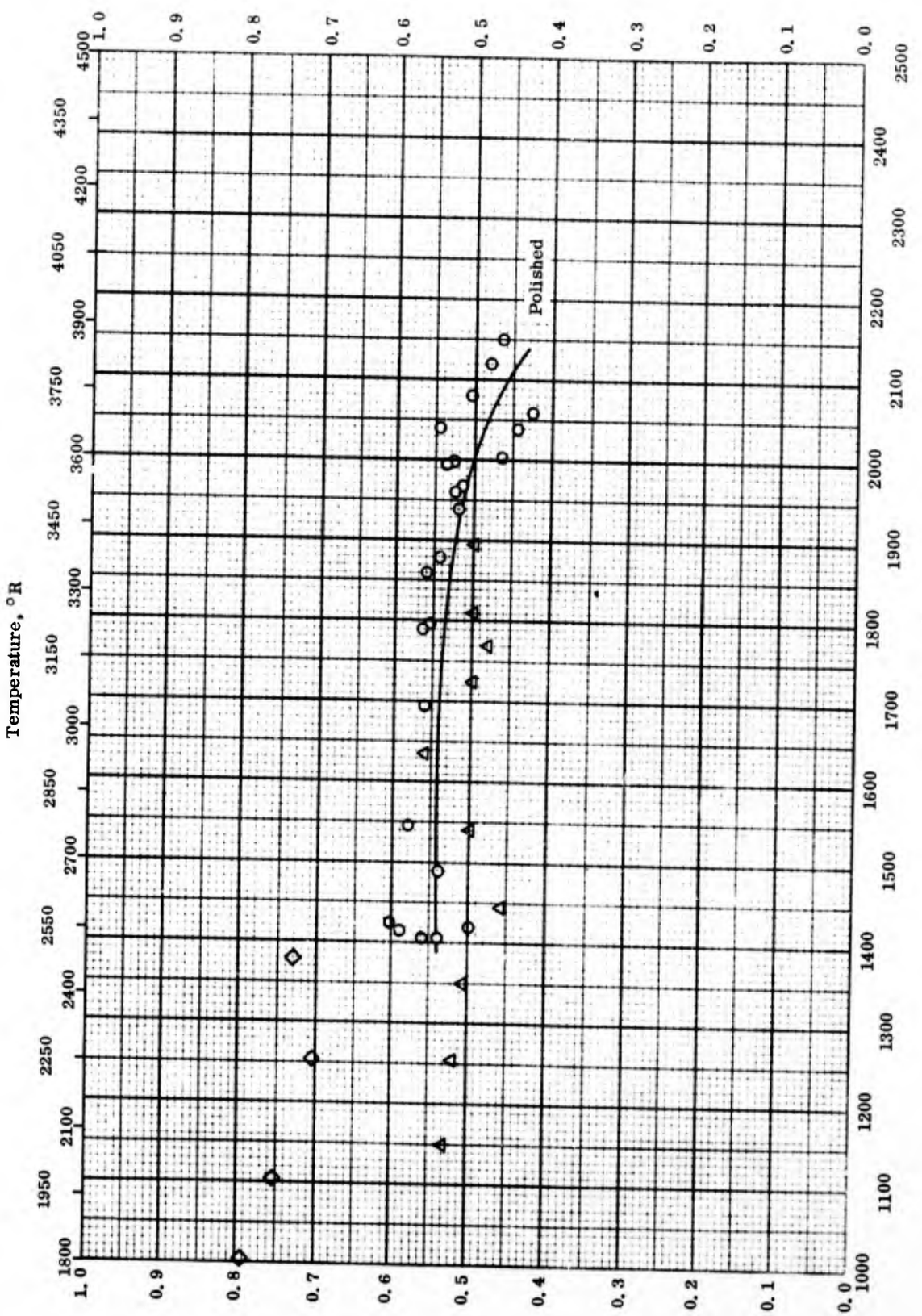


HEMISPHERICAL TOTAL EMITTANCE -- URANIUM CARBIDE

HEMISPHERICAL TOTAL EMITTANCE --URANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-8	1650-1980		UC_2 with 0.3 O_2; 95% of theoretical density.	Hot pressed in graphite for 15 min. at about 1973 K and 6000 psi; cleaned and polished.
△	62-8	1250-1990		UC; 94.7 U, 5.3 C and 0.0220 O_2.	Polished to a shinny metallic surface; measured in vacuum at about 10^{-6} mm Hg for temperature < 1800 K and in argon at 100 mm Hg for temperature > 1800 K.
◇	62-8	1220-1255		Same as above.	Same as above; reacted surface (not reproducible).

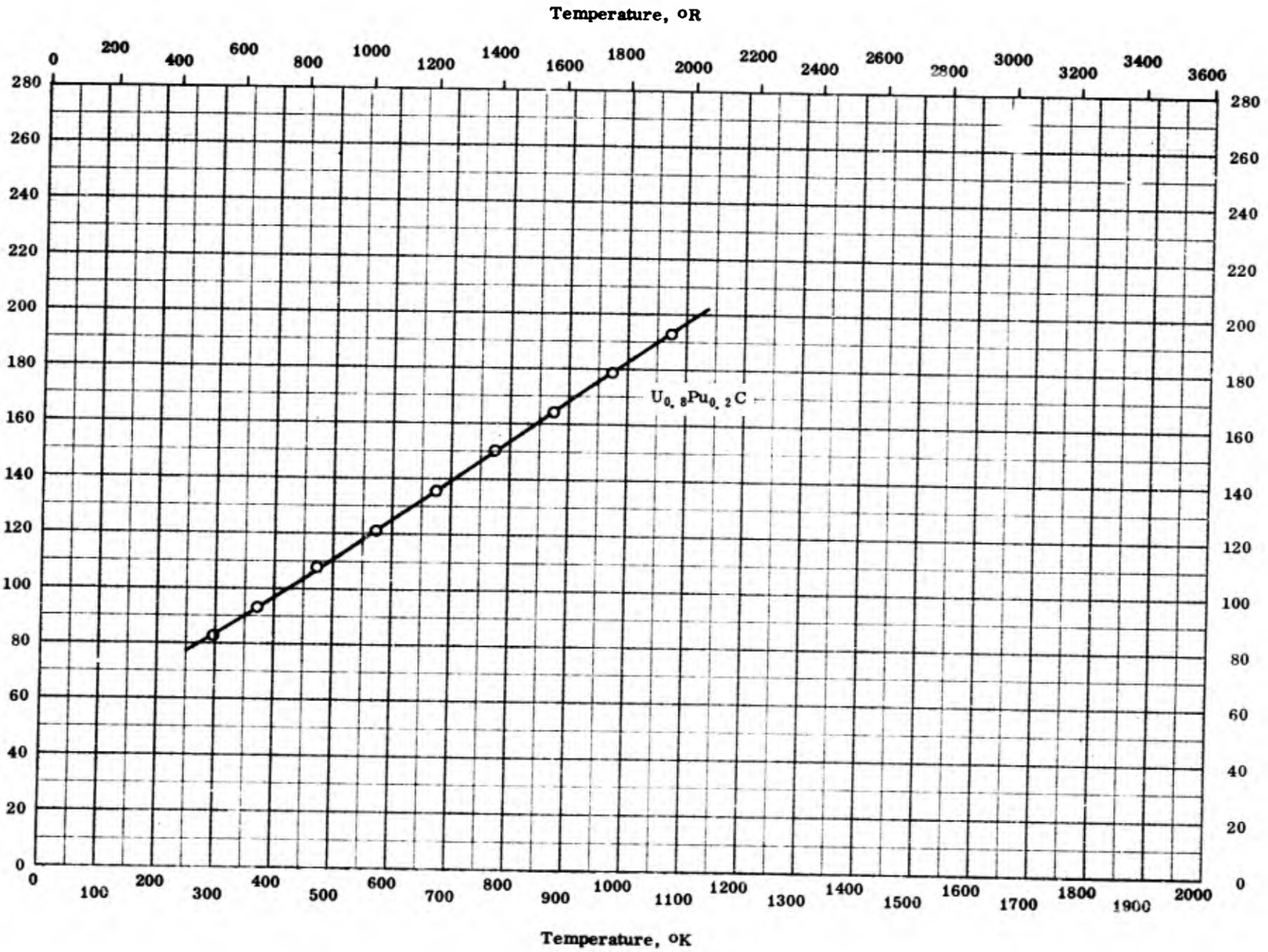


NORMAL SPECTRAL EMITTANCE -- URANIUM CARBIDES

NORMAL SPECTRAL EMITTANCE -- URANIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-8	0.65	1450-2150		UC_2 with 0.3 O_2; 95% of theoretical density.	Hot pressed in graphite for 15 min. at about 1973 K and 6000 psi; cleaned and polished.
△	62-8	0.65	1150-1894		UC; 94.7 U, 5.3 C, and 0.0220 O_2.	Polished to a shinny metallic surface; measured in vacuum.
◇	62-8	0.65	1005-1300		Same as above.	Same as above; reacted surface (not reproducible).

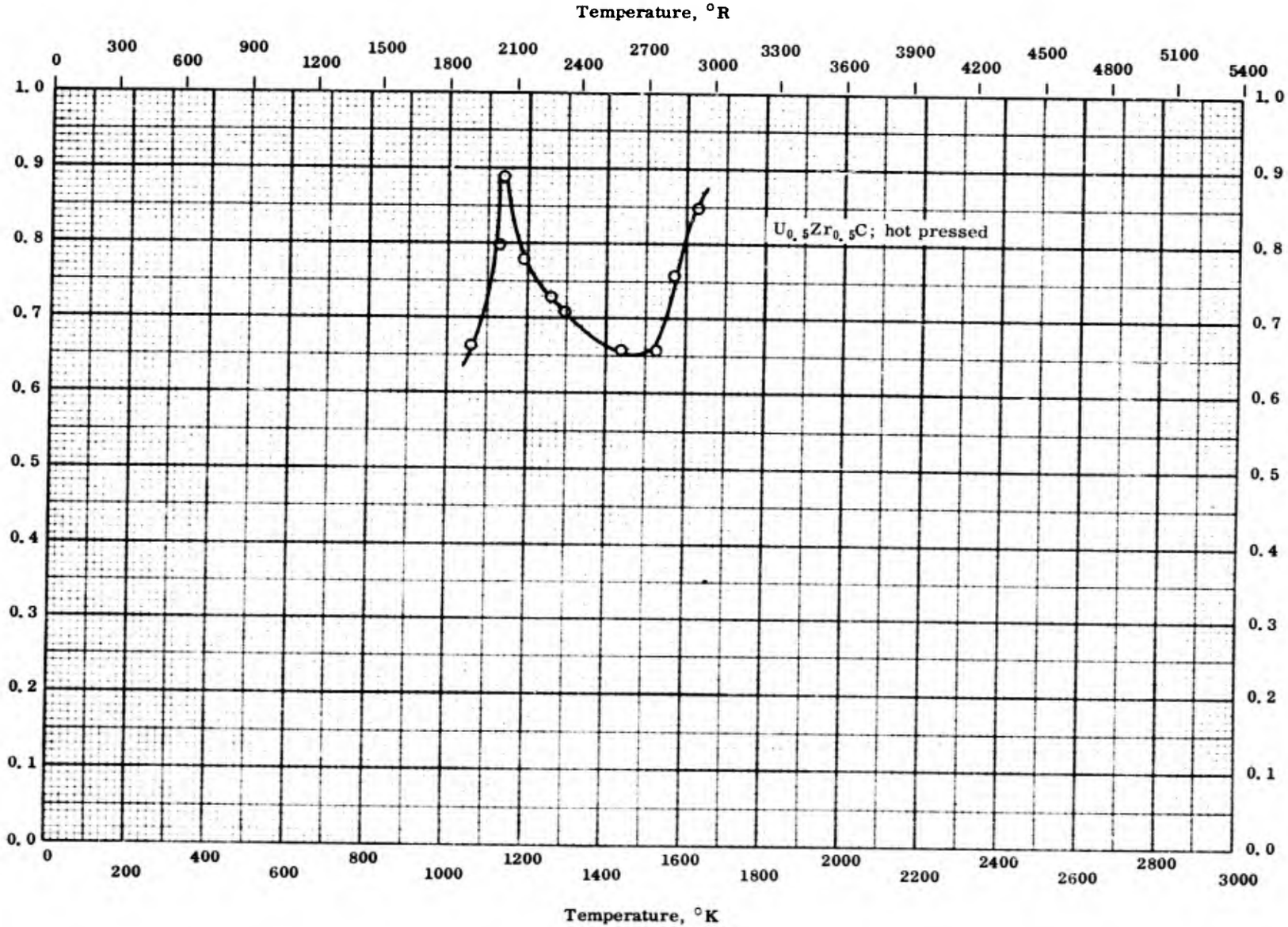


ELECTRICAL RESISTIVITY -- URANIUM PLUTONIUM CARBIDE

ELECTRICAL RESISTIVITY -- URANIUM PLUTONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-4	298-1073		$U_{0.8}Pu_{0.2}C$.	



NORMAL SPECTRAL EMITTANCE -- URANIUM ZIRCONIUM CARBIDE

NORMAL SPECTRAL EMITTANCE -- URANIUM ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-8	0.65	1060-1630		$U_{0.5}$ $Zr_{0.5}$ C; from mixed 325 mesh powders of UC and Zr C.	Hot-pressed from UC and ZrC powders, adding 1 Ni to aid in densification, in graphite at about 2000 K with 6000 psi for 15 min.

PROPERTIES OF VANADIUM CARBIDES

REPORTED VALUES

Density:	g cm^{-3}	lb ft^{-3}
VC	5.77*	360*

Melting Point:	K	R
○ VC	3083	5550
□ VC	2923 ± 25**	5261± 45**
△ VC	3107	5593
▽ V_2C	2438±25	4388± 45

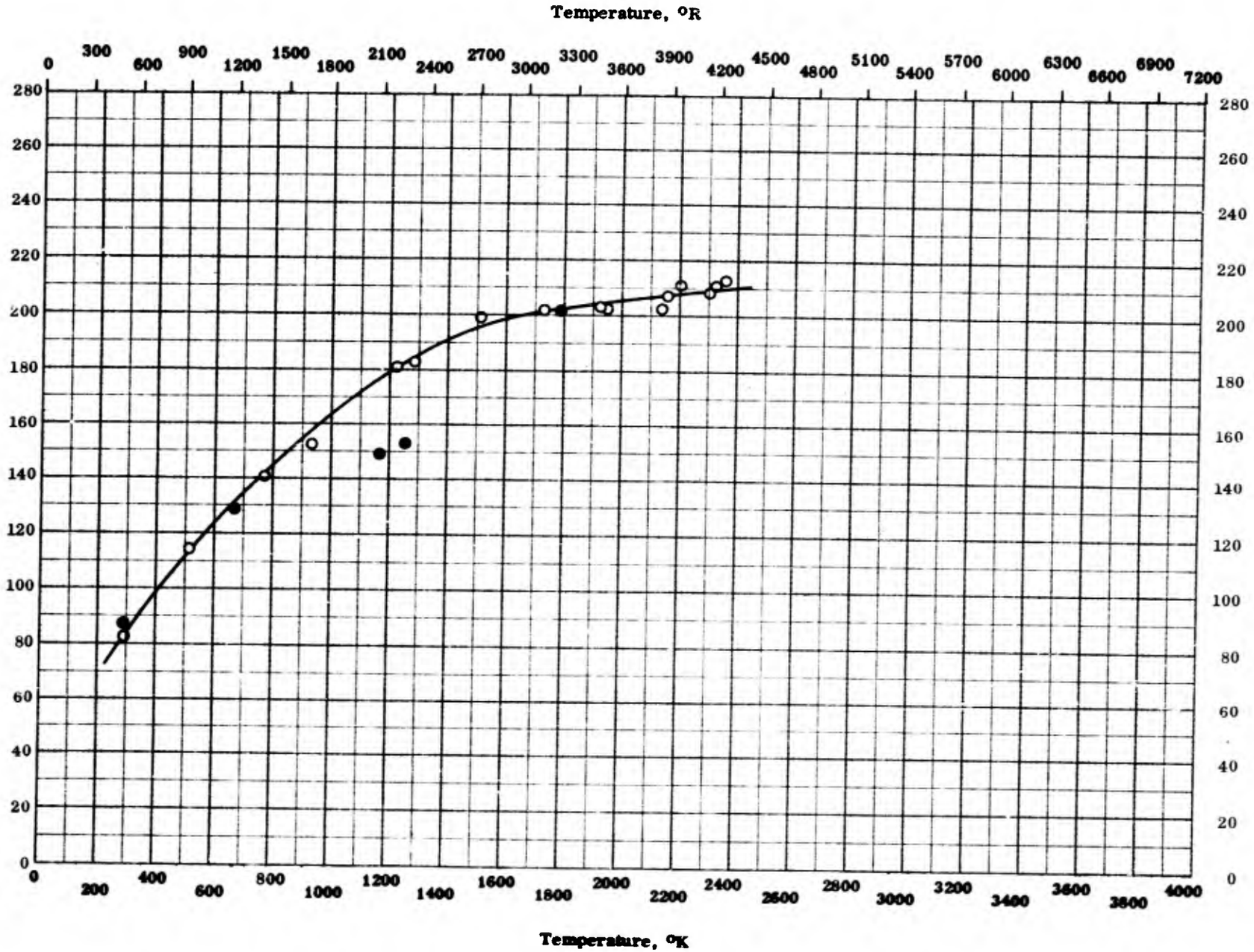
*Handbook of Chemistry and Physics (Ref. 64-18)

**Most probable value for this compound.

PROPERTIES OF VANADIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	58-10	3083		VC.	
□	62-47	2898-2948		VC.	
△	60-8	3107		VC.	
▽	62-47	2413-2463		V_2C.	

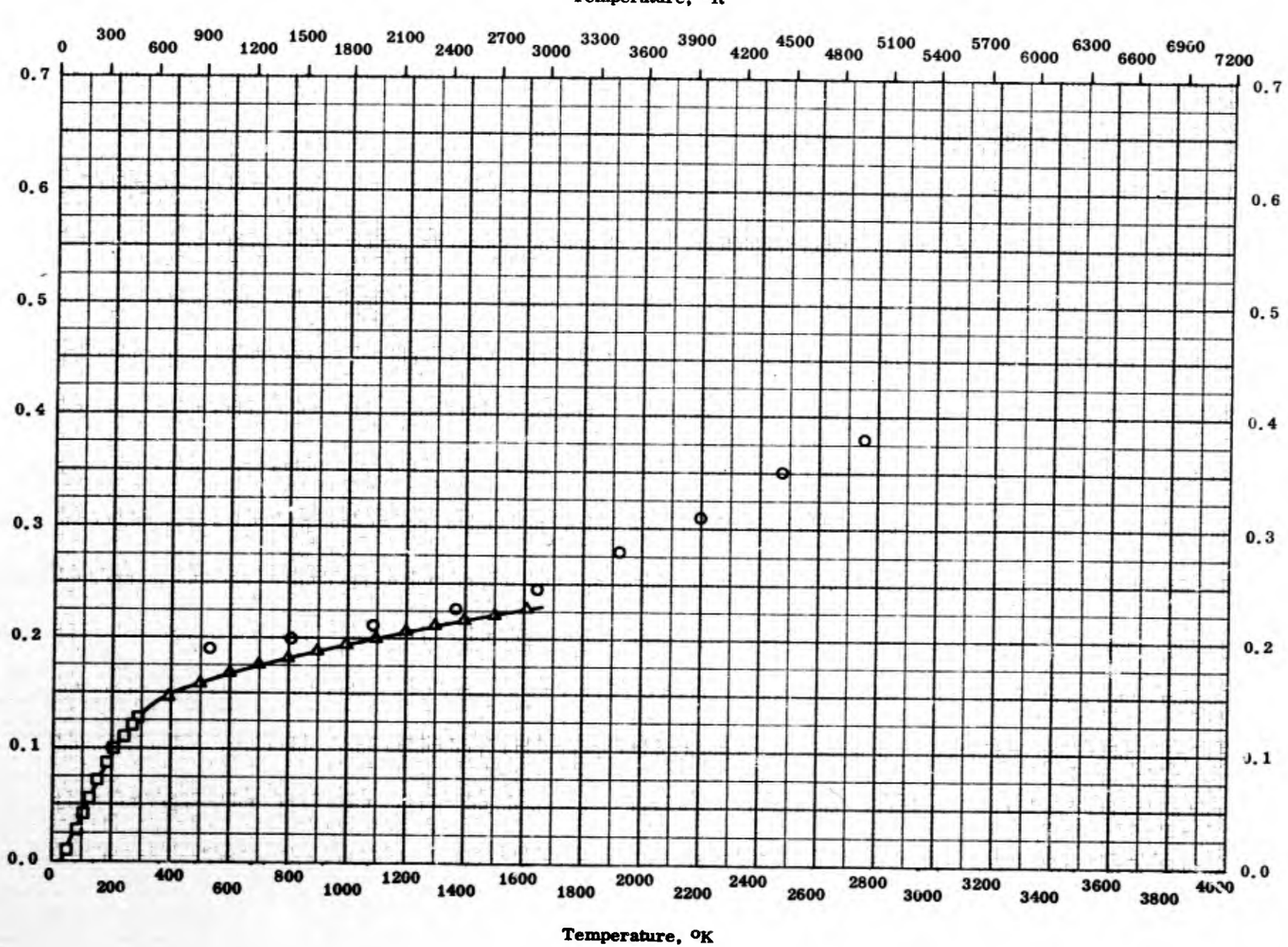


ELECTRICAL RESISTIVITY -- VANADIUM CARBIDE

ELECTRICAL RESISTIVITY -- VANADIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	297-2355	2.4	81.0 V, 18.6 C, and 0.5 N.	Hot pressed; max. exposure temperature 4675 F.
●	62-6	297-2355	2.4	Same as above.	Cooling curve of the above sample.

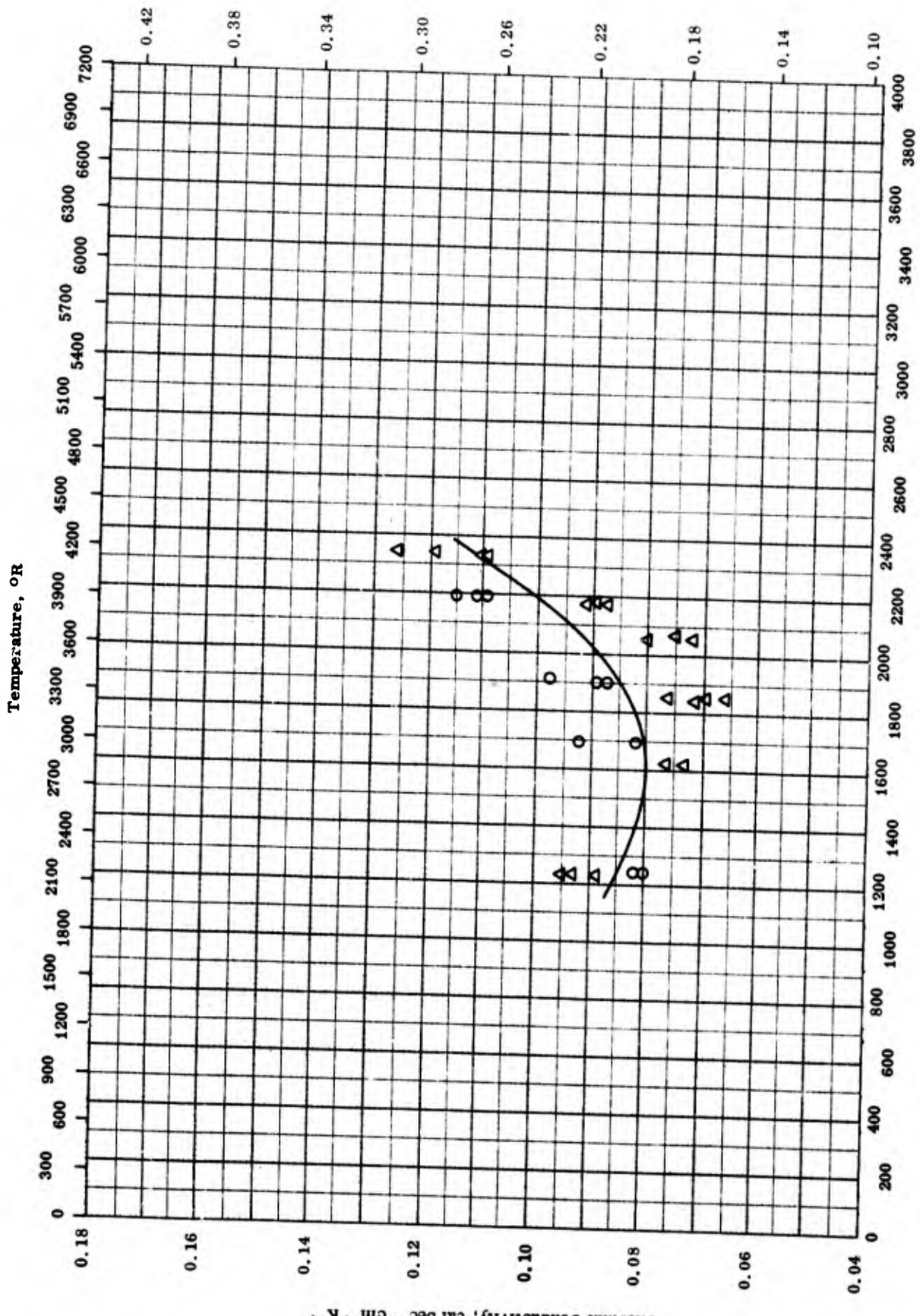


SPECIFIC HEAT -- VANADIUM CARBIDE

SPECIFIC HEAT -- VANADIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	533-2755	≤5	VC; before test: 81.0 V, 18.6 C, 0.7 Fe, and 0.5 N_2; density 342 lb ft^{-3}; after test: 80.8 V, 18.4 C, and 0.3 N_2; density 318 lb ft^{-3}.	Hot pressed; crushed in hardened steel mortar to pass 100-mesh screen.
□	49-4	52-298		VC; 80.9 V, and 19.04 C.	Heated in vacuum total 26 hrs at 1300 - 1350 C; product analyzed and adjusted in composition after 12 and 22 hrs of heating.
△	49-3	397-1611		VC; 80.90 V, and 19.04 C.	Same as above.

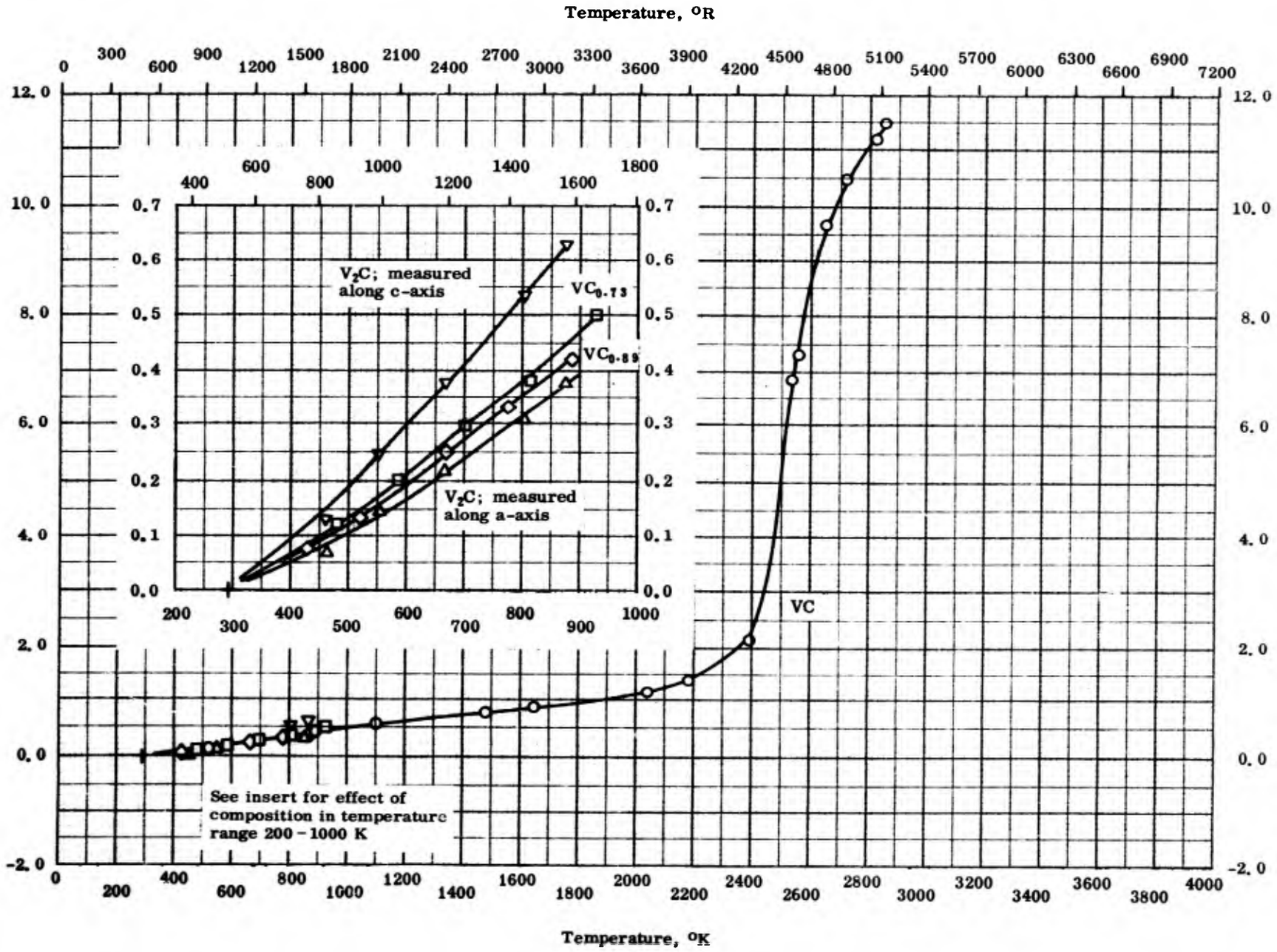


THERMAL CONDUCTIVITY -- VANADIUM CARBIDE

THERMAL CONDUCTIVITY -- VANADIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	1242-2189	5-7	VC.	Ground and polished thoroughly; heat-soaked at 3675 F; sample found cracked on post inspection.
Δ	62-6	1230-2342	5-7	VC.	Same as above; heat-soaked at 3475 F; sample found cracked on post inspection.

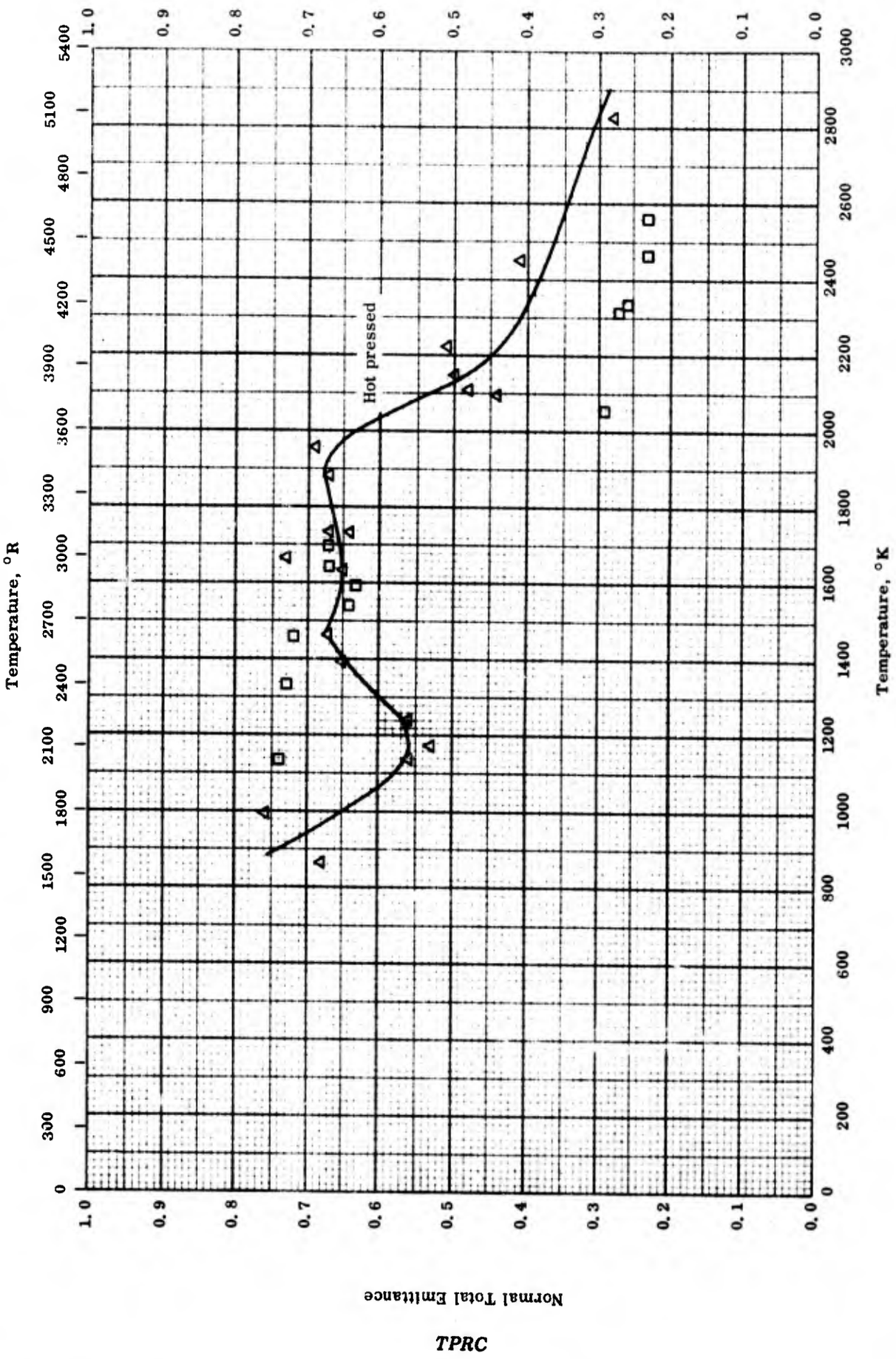

Temperature, °R
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100
5400
5700
6000
6300
6600
6900
7200
12.0
10.0
8.0
6.0
4.0
2.0
0.0
-2.0
400
600
800
1000
1200
1400
1600
1800
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
V2C; measured along c-axis
VC0.73
VC0.89
V2C; measured along a-axis
200
300
400
500
600
700
800
900
1000
VC
See insert for effect of composition in temperature range 200 - 1000 K
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
Temperature, °K
Thermal Linear Expansion, percent
Thermal Linear Expansion, percent

TPRC

THERMAL LINEAR EXPANSION -- VANADIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	294-2853	5	VC from Carborundum Co.; 81.0 V, 18.6 C, and 0.5 N; elements found by semi-quantitative emission spectrography before exposure 0.7 Fe; after exposure 80.8 V, 18.4 C, and 0.3 N; density in g cm^{-3} by ASTM method B 311-58 before exposure 5.42, after exposure 5.0; initial length 2.331 in., final length 2.510 in. [Author's design: Run No. E 6]	Hot pressed; measured in helium atm; melting evident on post inspection; photomicrographs taken after exposure revealed considerable rearrangement of carbide phase with migration to to grain boundaries and changes in dispersion size and shape.
□	65-7	298-933		$VC_{0.73}$; 0.040 N, 0.040 Fe, and 0.008 O; cubic structure.	Mixture of powdered elements heated in vacuum (approx 2 x 10^{-6} Torr) to 1370 C, ground to -325 mesh, and iron impurity removed with hot HCl; measured in a-direction with x-ray diffraction camera; percent expansion calculated from lattice parameters.
◇	65-7	299-888		$VC_{0.89}$; 5.79 free carbon, 0.027 O, 0.014 N, and <0.050 Fe; cubic structure.	Same as above except heated to 1400 C.
△	65-7	299-876		Author calls sample V_2C because he did not know exact composition of this phase; hexagonal structure.	Mixture of powdered elements heated in vacuum (approx 2 x 10^{-6} Torr), ground to -325 mesh, and iron impurity removed with hot HCl; measured in a-direction with x-ray diffraction camera; percent expansion calculated from lattice parameters.
▽	65-7	299-876		Same as above.	Same as above except measured along c-axis.



NORMAL TOTAL EMITTANCE — VANADIUM CARBIDE

NORMAL TOTAL EMITTANCE -- VANADIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	62-6	866-2822	10	VC; density 5.47 g cm^{-3}.	Hot-pressed; in argon atmosphere; first run.
□	62-6	1138-2561	10	Same as above.	Same as above; second run.

PROPERTIES OF ZIRCONIUM CARBIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.4	400
Melting Point	3533	6359

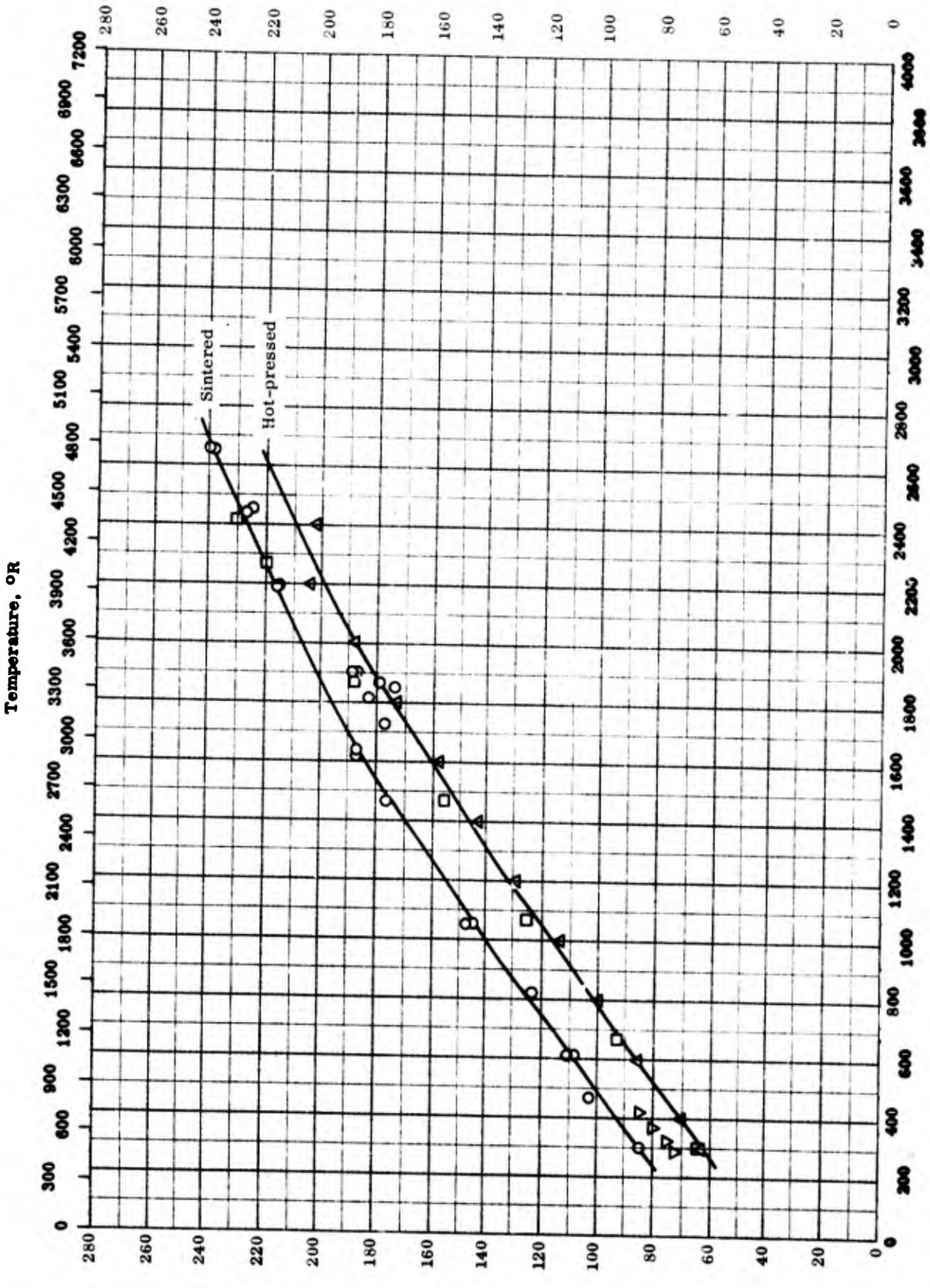
REPORTED VALUES

Density:		$g\ cm^{-3}$	$lb\ ft^{-3}$
	○	6.30	393
	△	5.95	371
Melting Point:		K	R
	□	3800	6840
	▽	3533 ± 25	6395 ± 45

PROPERTIES OF ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50–8	298		ZrC; 86.22 Zr, 9.44 combined C, and 4.07 free C.	Author computed density 6.44 g cm^{-3} from lattice measurement of others.
□	56–11	3800		ZrC.	
△	62–5	298		ZrC.	Max. exposure temperature 4700 F.
▽	61–22	3508–3558		ZrC.	

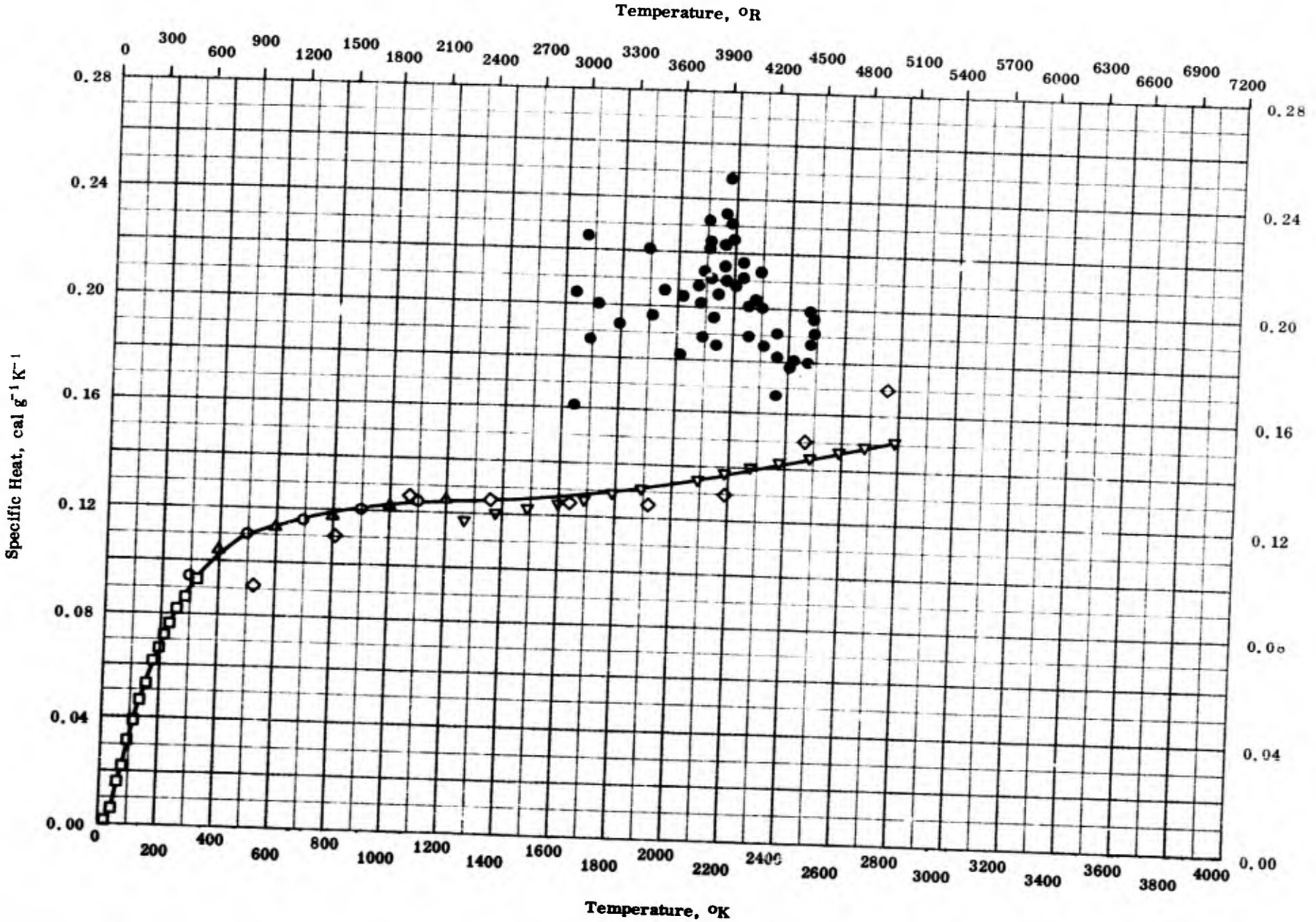


ELECTRICAL RESISTIVITY -- ZIRCONIUM CARBIDE

ELECTRICAL RESISTIVITY -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	300-2655	2.4	ZrC; 88.5 Zr, 11.0 C, 0.5 N.	Pressed and sintered; max. exposure temperature 4900 F.
Δ	62-8	300-2400	±2	ZrC; 11.7 to 11.8 total C; high purity powder from Wah-Chang Company.	Hot pressed at 2300 C and 6000 psi for 1 hr; average data of two samples.
▽	62-12	295-423		ZrC.	
□	64-3	313-2413		ZrC with 87.85 Zr, 12.14 C, and 0.7> metallic impurities; density 6.39 g cm^{-3}; numerous microscopic dark areas (probably voids) located in grain boundaries.	

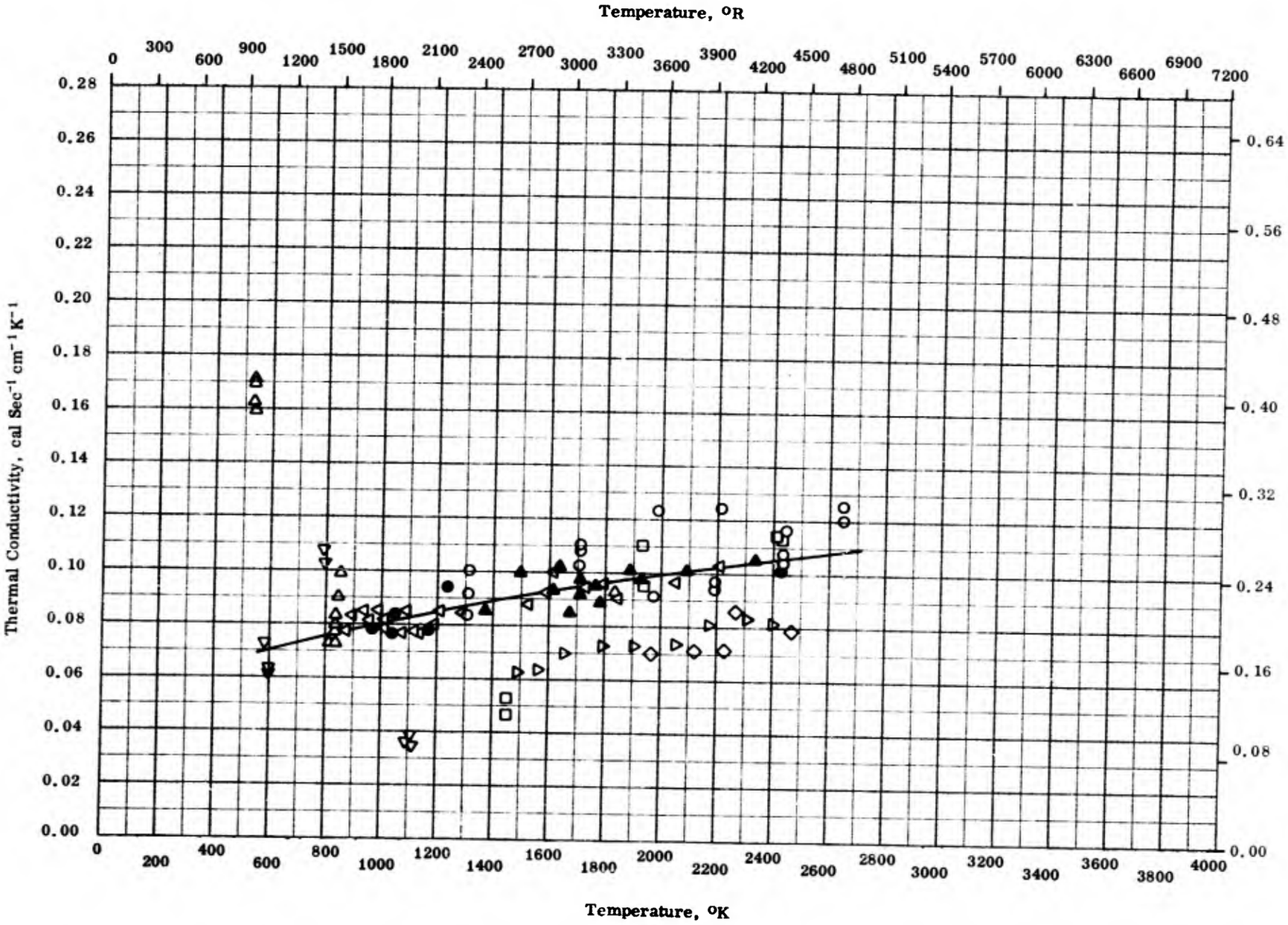


SPECIFIC HEAT -- ZIRCONIUM CARBIDE

SPECIFIC HEAT -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-1	300-1200	±0.7	ZrC; traces of Al, Ca, Fe, Mn, and Si.	
□	62-22 also 63-13	5-345	0.1-5	ZrC; 89.27 Zr, 11.20 C, 0.12 Ti, 0.07 B, 0.07 Fe, 0.067 N_2, 0.01 Al and Sn, 0.005 O_2, 0.001 Si, 0.001 - 0.01 Mg, and 0.0001 Ca, Cu, Hf, Mn, Mo, and Pb.	Zone refined.
△	62-22 also 63-13	300-1200		Same as above.	Same as above.
◇	60-8 also 62-5	533-2755	≤5.0	ZrC; before test: 88.5 Zr, 11.0 C, 0.50 N_2, and 0.10 total impurities; density 395 lb ft^{-3}; after test: 89.3 Zr, 10.8 C, and 0.5 N_2; density 292 lb ft^{-3}.	Pressed and sintered.
▽	65-5	1274-2799	1.4	ZrC; 88.24 Zr, 11.13 combined C, 0.24 free C, 0.1> Hf, and 0.05 O_2.	Hot pressed in graphite dies and then electrospark machined.
●	62-16	1639-2499	5.0	ZrC; 84.23 Zr, 10.46 total C, 1.21 O_2, 1.03 N_2, 0.78 Hf, 0.7> Nb, 0.25 free C, 0.2> Ni, 0.19 Fe, 0.15 Cu, 0.14 Ti, 0.12 Al, 0.07 V, 0.02 Mn, and 0.01> Mg.	Solid pieces machined to specifications by using diamond tools and electric discharge techniques.

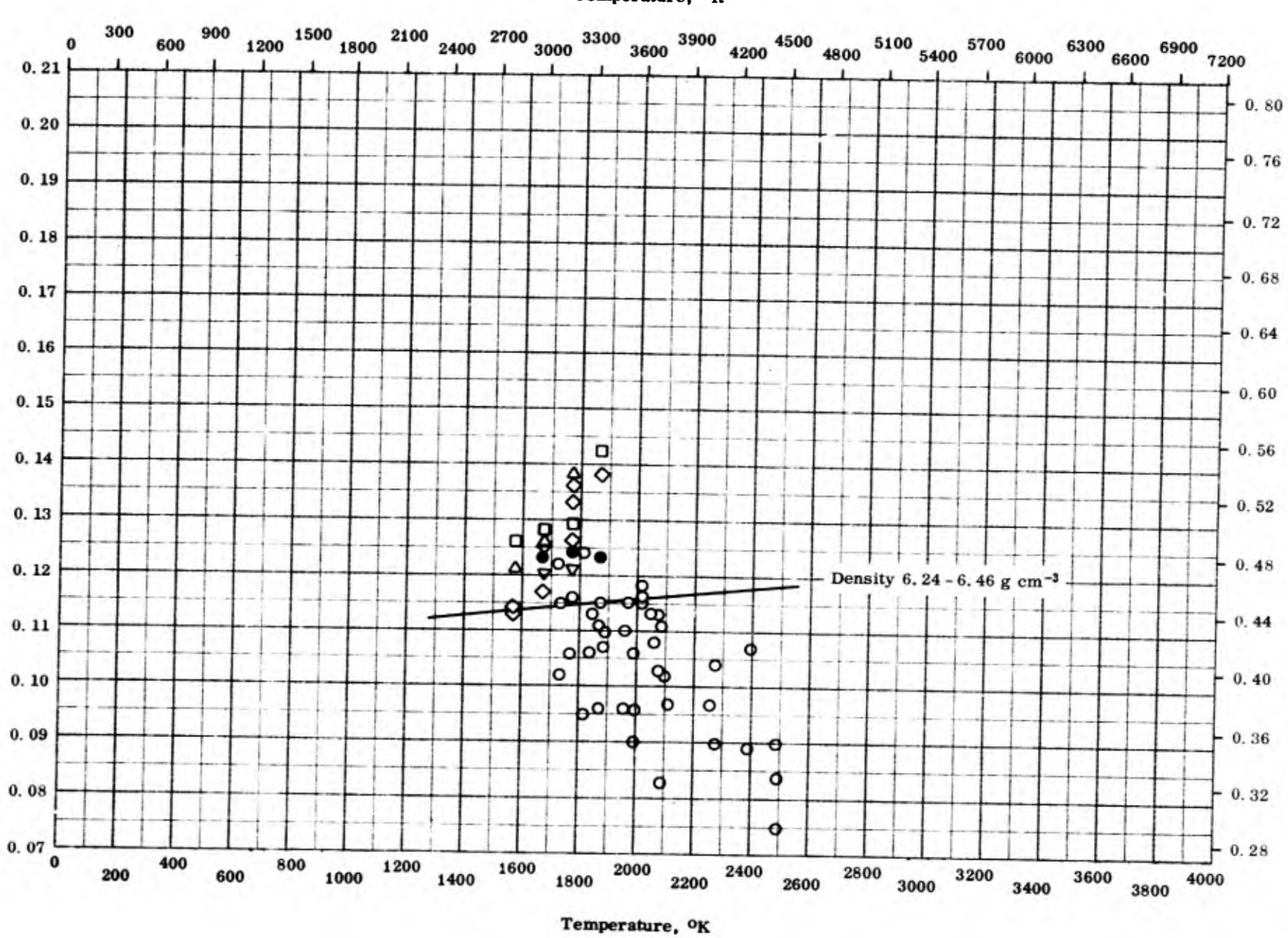


THERMAL CONDUCTIVITY -- ZIRCONIUM CARBIDE

THERMAL CONDUCTIVITY -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	528-847	2-4	ZrC; density 371 lb ft^{-3}.	Pressed and sintered; maximum exposure temperature 4700 F.
□	62-5	581-1111	2-4	same as above.	Same as above.
△	62-5	1308-2650	2-4	Same as above.	Same as above.
▽	62-5	1450-2425	2-4	Same as above.	Same as above except being heat-soaked; sample found deteriorating at 4700 F (2866 K).
◇	62-8	1965-2470		ZrC; 11.7 C (including 0.18 free carbon) and 0.0020 > O_2; 90% theoretical density.	Prepared by the following steps: 1. Three rods of 1 1/4, 1 1/4, and 1 1/2 cm long were hot-pressed from 325 mesh high purity powder. 2. These three rods were hot-pressed together for 1 hr at 2300 C and 6000 psi. 3. Polished and then heated to 2400 K for 1 hr before measurement.
▷	62-8	1490-2400		ZrC; 11.8 C (including 0.3 free carbon); same as above.	Same as above.
◁	62-2	813-2208		ZrC; 89.8 Zr, 11.0 C, and 0.3 > metallic impurities; single phase with average grain size 50 μ; density 6.13 g cm^{-3}.	Hot-pressed.
●	62-2	813-2423		ZrC; 87.8 Zr, 12.1 C, 0.6 > metallic impurities; same as above except density 6.17 g cm^{-3}.	Hot-pressed.
▲	62-2	1368-2338		ZrC; 89.8 Zr, 11.0 C, and 0.2 > metallic impurities; same as above except 6.18 g cm^{-3} density.	Hot-pressed.

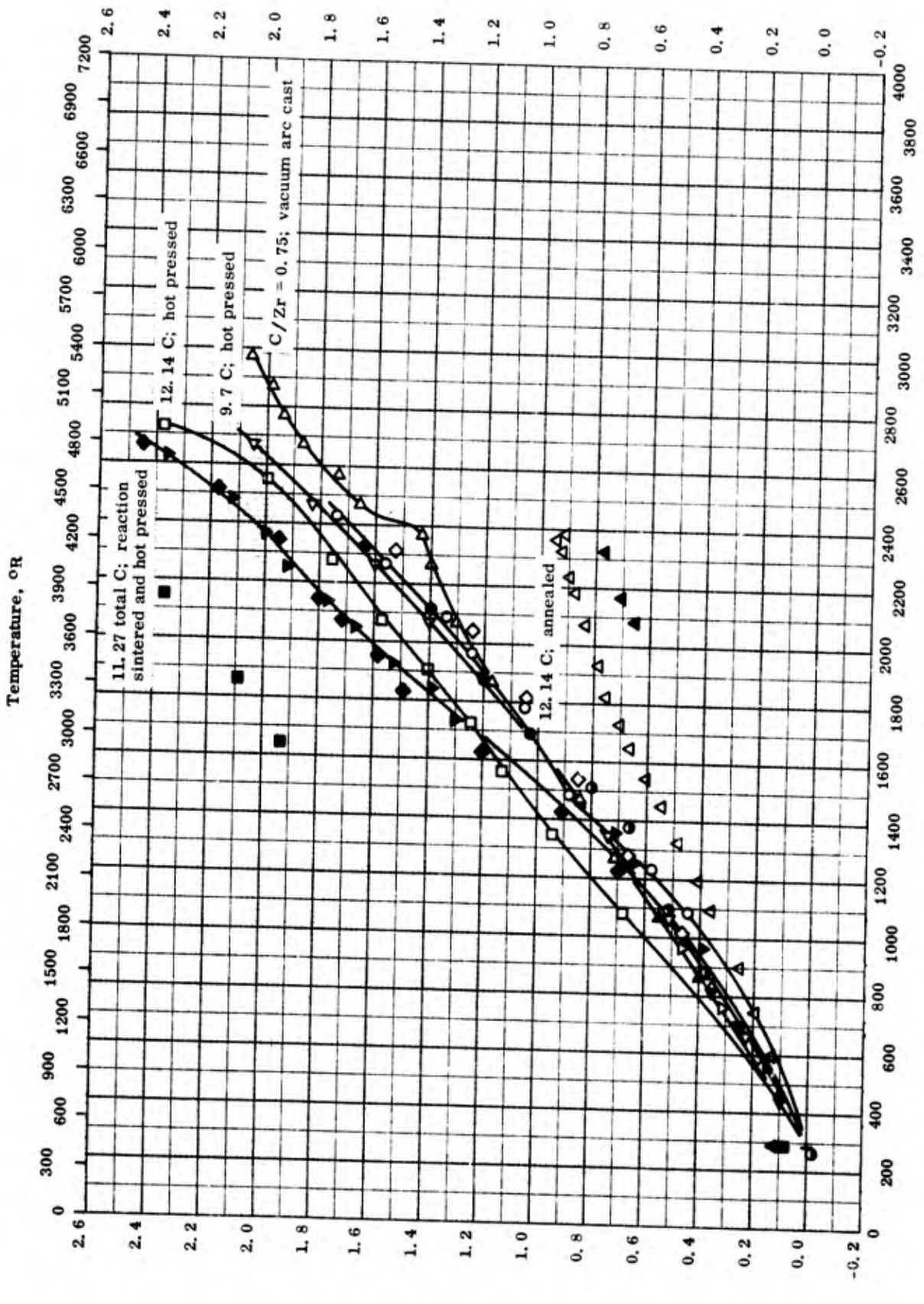


THERMAL DIFFUSIVITY -- ZIRCONIUM CARBIDE

THERMAL DIFFUSIVITY -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
●	62-2	1673-1873	7	89.8 Zr, 11.0 C, and 0.2>metallic impurities by chemical analysis of sample as received and 87.94 Zr, 11.30 C, and 0.3>metallic impurities by chemical analysis of raw powder; single phase with average grain size 50 μ; density 6.24 g cm^{-3}.	Hot-pressed.
□	62-2	1573-1873	7	Same as above.	Third run of the above sample.
△	62-2	1573-1773	7	Same as above.	Fifth run of the above sample.
▽	62-2	1673-1773	7	Same as above.	Seventh run of the above sample.
◇	64-3	1573-1873		Same as above except average grain size 10(ASTM).	Hot-pressed.
○	64-3	1673-2493		87.8 Zr, 11.5 C, and 0.1 Fe by chemical analysis of raw powder and 87.5 Zr, 11.2 C, 0.05 Mo, 0.05 Hf, 0.05<Ti, 0.035 Ca, 0.02 Al, 0.012<V, 0.008 Si, 0.004 Fe, 0.002 B, 0.002 Cr, and 0.001 Ba by chemical analysis of sample as received; average grain size 8.5(ASTM); density 6.46 g cm^{-3}.	Hot-pressed.



THERMAL LINEAR EXPANSION -- ZIRCONIUM CARBIDES

THERMAL LINEAR EXPANSION -- ZIRCONIUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◇	63-32	298-2313		$ZrC_{0.95}$; 87.69 Zr, 11.14 C (0.14 free C), 0.26 N, 0.22 B, 0.22 Ti, 0.18 Fe, and 0.11 O; total impurity 1.13; total analysis 99.82.	Pressed from powder of less than 6 microns dia at 18000 psi and heated in vacuum to 1500 C for 1 hr; data obtained from (440) and (511/333).
▽	58-7	296-1267		$ZrC_{0.957}$ from Powder Metallurgy Section, Los Alamos Scientific Lab.; 83.3 Zr and 11.0 C (0.5 free C).	X-ray diffraction method.
△	62-5	294-2389	2	ZrC from General Electric Co.; before exposure 88.5 Zr, 11.0 C, 0.5 N, and 0.1 others; after exposure 89.3 Zr, 10.8 C, and 0.5 N; density in g cm^{-3} at 25 C by ASTM method B 311-58 before exposure 6.27, after exposure 6.24; initial length 2.1630 in. [Author's design; Run SRI-E 26]	Pressed and sintered; measured in helium atm.
▲	62-5	294-2389	2	Same as above.	Cooling cycle for above sample; sample broken on post inspection.
▷	64-14	293-2979		ZrC, Aerospace Corp.; C/Zr ratio of 0.75 in ZrC phase; prepared from nuclear grade zirconium sponge (99.9 pure) and AGOT carbon (approx 15 wt % initial melt).	Vacuum arc cast, pulverized to < 100 mesh, ground to 325 mesh, made into a slurry of 0.1 g powdered carbide with 0.5 ml binder (Duco cement and acetone 1:20 by volume), and dried; measured with x-ray diffractometer aligned on (111) reflection in helium.
□	64-3	293-2728		ZrC as received from Carborundum Corp.; 87.85 Zr, 12.14 C, and < 0.7 impurities; density 6.39 g cm^{-3}. [Author's design: A]	Hot pressed.

(Continued onto next page)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
■	64-3	293-2520		Same as above.	Cooling cycle for above sample.
○	64-3	293-2430		Same as above. [Author's design : B]	Annealed.
●	64-3	1693-2333		Same as above.	Cooling cycle for above sample.
◁	63-30	298-2673		9.7 C (1.4 free C), 1 Hf, 0.94 N, 0.18 O, 0.01 - 0.1 Fe, 0.01 - 0.1 Ti, 0.001 - 0.01 Co, Ni, 0.001 - 0.1 Cr and < 0.001 Si, Al, Sn, and V; density before heat treated 6.19 - 6.5 g cm^{-3}.	Hot pressed by vendor and heat treated for 1 hr at 2150 C at JPL; measured up to 1100 C in argon atm with dilatometer and with telemicroscope above 1100 C in carbonaceous argon atm.
▼	64-15	298-2621		Stoichiometry based on combined carbon $ZrC_{0.95}$; 88.43 Zr, 11.27 total C, 0.26 free C, 0.1 Fe, 0.03 Ca, Si, < 0.03 Hf, Ta, < 0.01 B, 0.005 Ti, < 0.005 Mn, 0.003 Cu, Al, and < 0.002 Mg; prepared from reactor grade zirconium oxide (99.30 ZrO_2 from The Carborundum Co.) and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.896 in.; density 5.99 g cm^{-3}, 89.3% theoretical density. [Author's design : Run 1]	ZrO_2 reacted with carbon, cold pressed into briquets using polyvinyl alcohol as temperary binder, raction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon atm parallel to hot pressing direction.
◆	64-15	298-2663		Same as above. [Author's design : Run 3]	Same as above.
▶	62-37	298-1623		91.2 vol. % ZrC; porosity 8.8; bulk density 6.11 g cm^{-3}; ZrC from New Products Branch, The Carborundum Co. in form of -325 mesh powder; spectrographic analysis of ZrC powder: 0.1 - 0.5 Fe, 0.01 - 0.05 Cr, Ca, and 0.005 - 0.01 B, Si, Ti; density of ZrC calculated from crystal structure data 6.70 g cm^{-3}. [Author's design : Composite OB]	Prepared in rotary mill, hot pressed at 2250 C and 2000 psi into 4-1/2 in. diameter by 4 in. long bodies, cut to size, and ground; expansion measured perpendicular to hot pressing direction.

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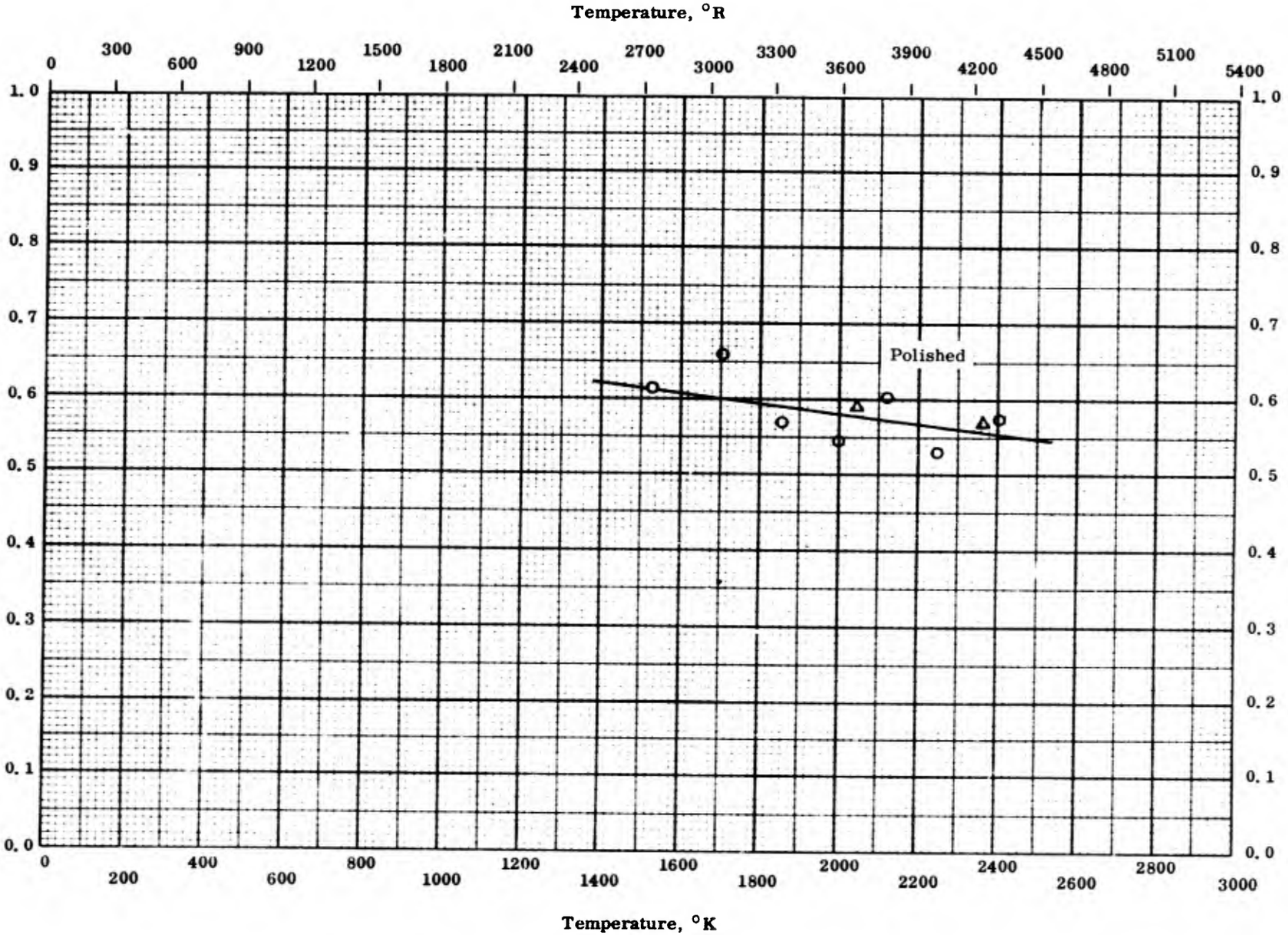
THERMAL LINEAR EXPANSION -- ZIRCONIUM CARBIDES (Continued)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◀	50-8	293-822		9.44 combined C and 4.07 free C.	Hot pressed in graphite mold; heating rate during test 4 C min^{-1}.
◒	55-11	273-1518		12.72 total C (cf. theor. 11.64 C) with 1.30 free C, 1-10 Hf, 0.1-1.0 Si, 0.01-0.1 Al, Cr, Fe, Ti, and 0.0001-0.001 Mg, Mn.	Sintered at 1400 C in He atm; measured in He atm by x-ray diffraction.
◆	62-42	283-773		Zirconium pyrocarbide.	Measured parallel to a-direction.

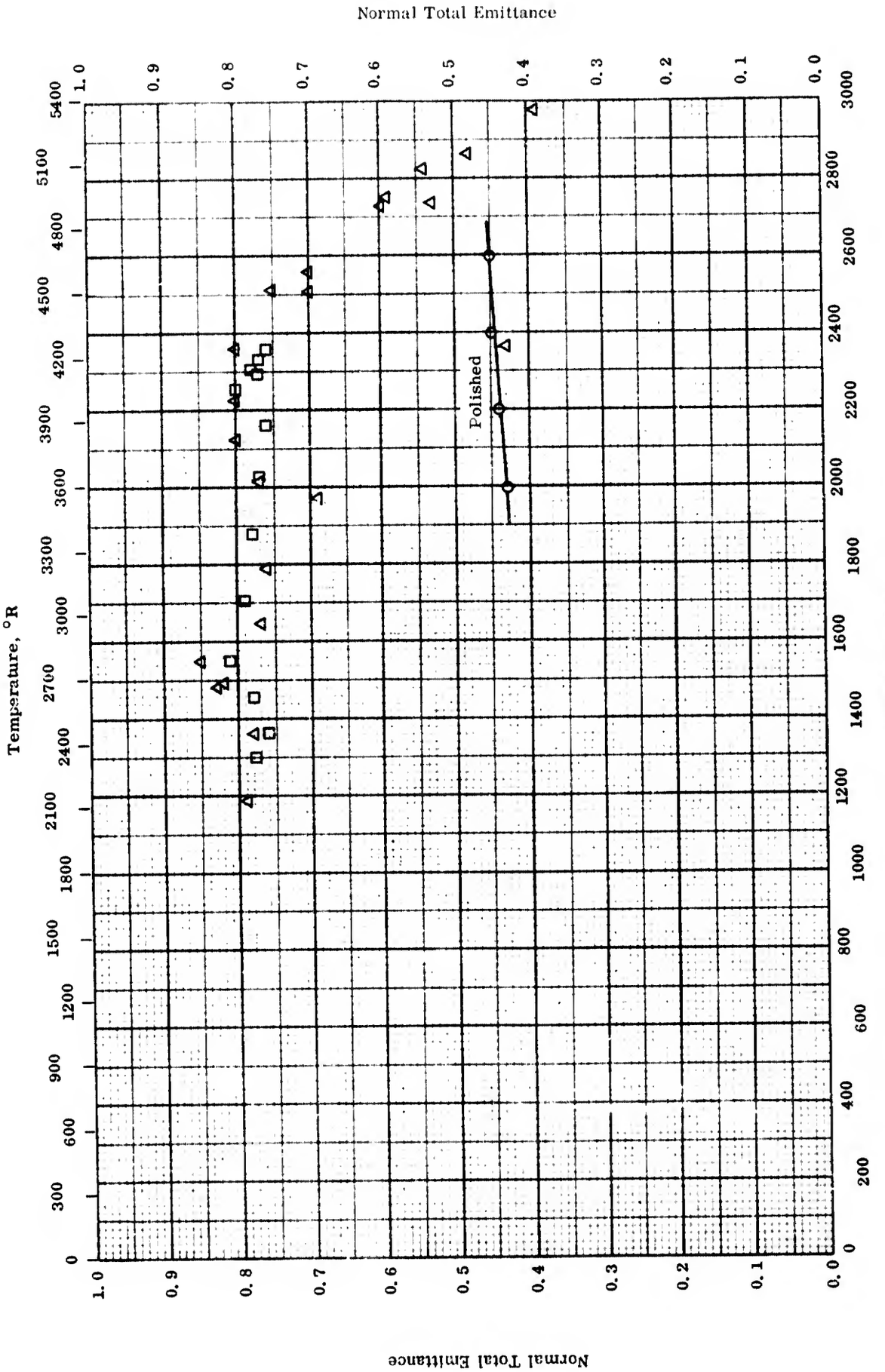


HEMISPHERICAL TOTAL EMITTANCE -- ZIRCONIUM CARBIDE

HEMISPHERICAL TOTAL EMITTANCE -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-8	1530-2405		ZrC; 11.8 C and 0.0020 > O_2.	Polished with 600 grit silicon carbide paper.
△	62-8	2045-2365		Same as above, 11.7 C.	Same as above.

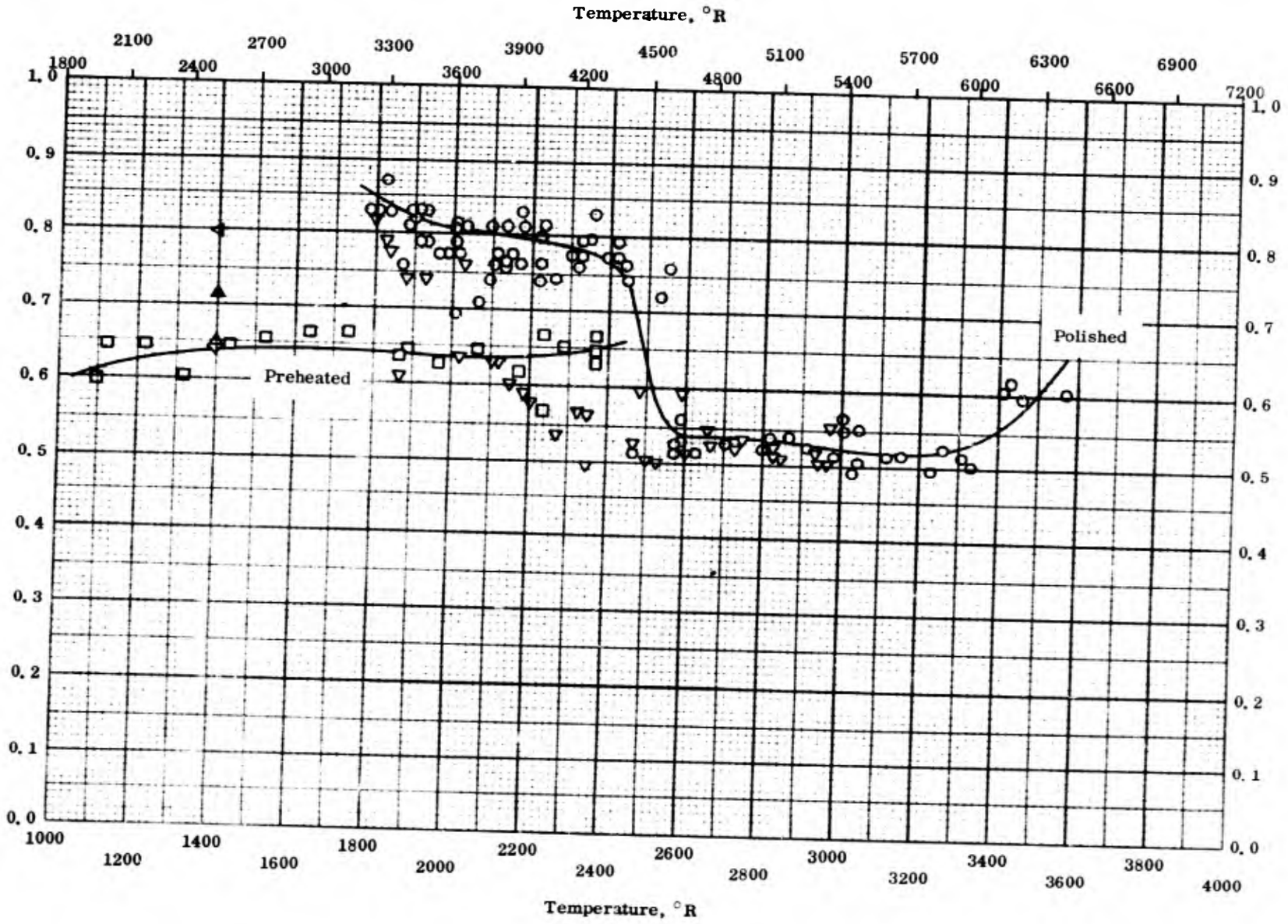


NORMAL TOTAL EMITTANCE — ZIRCONIUM CARBIDE

NORMAL TOTAL EMITTANCE -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-7	2000-2600		ZrC, 96 pure.	Polished; measured in vacuum at low temperature and in argon at high temperature.
△	62-6	1188-2977	10	ZrC; density 6.33 g cm^{-3}.	Pressed and sintered; measured in argon atmosphere; run No. 1.
□	62-6	1305-2338	10	Same as above.	Same as above; run No. 2.

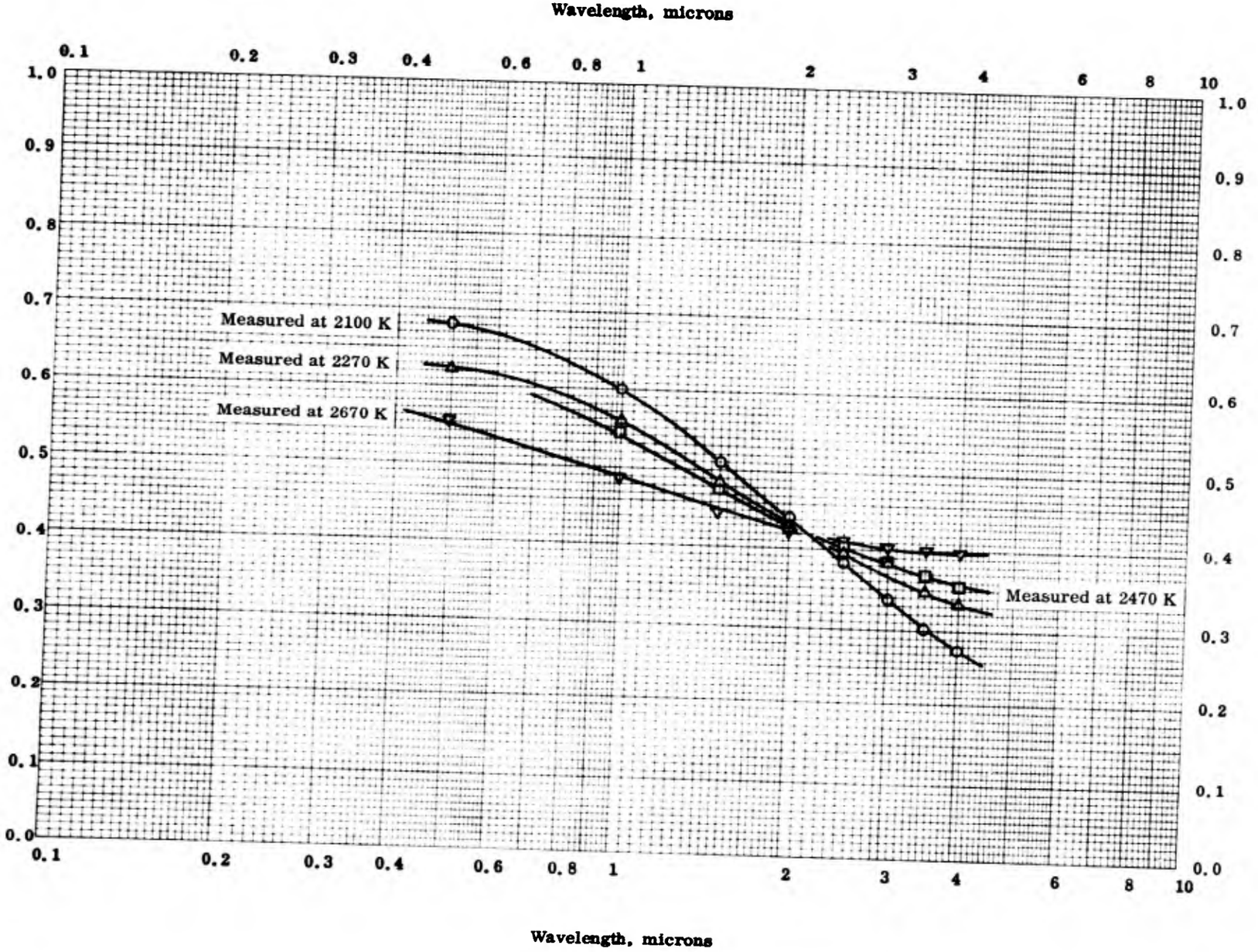


NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM CARBIDE

NORMAL SPECTRAL EMITTANCE — ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range° K	Rept. Error%	Sample Specifications	Remarks
○	61-9	0.65	1788-3573		ZrC	Polished with 400 grit diamond wheels; heating cycle.
▽	61-9	0.65	1803-2973		ZrC	Same as above, cooling cycle.
□	63-17	0.65	1100-2370		ZrC	Hot pressed in graphite dies from 325 mesh powder; preheated to 2400 K for 1 hr; each measurement below 2200 K preceded by flashing of the specimen to at least 2400 K; measured in a vacuum of 5×10^{-7} mm Hg.
◇	63-17	0.65	1400		Same as above.	Same as above; flashed to 2400 K and then cooled in less than 10 sec. to about 1400 K; measured in vacuum (5×10^{-7} mm Hg).
△	63-17	0.65	1400		Same as above.	Same as above except cooled in 14.5 min.
▲	63-17	0.65	1400		Same as above.	Same as above except cooled in 29.5 min.
◁	63-17	0.65	1400		Same as above.	Same as above except cooled in 61 min.



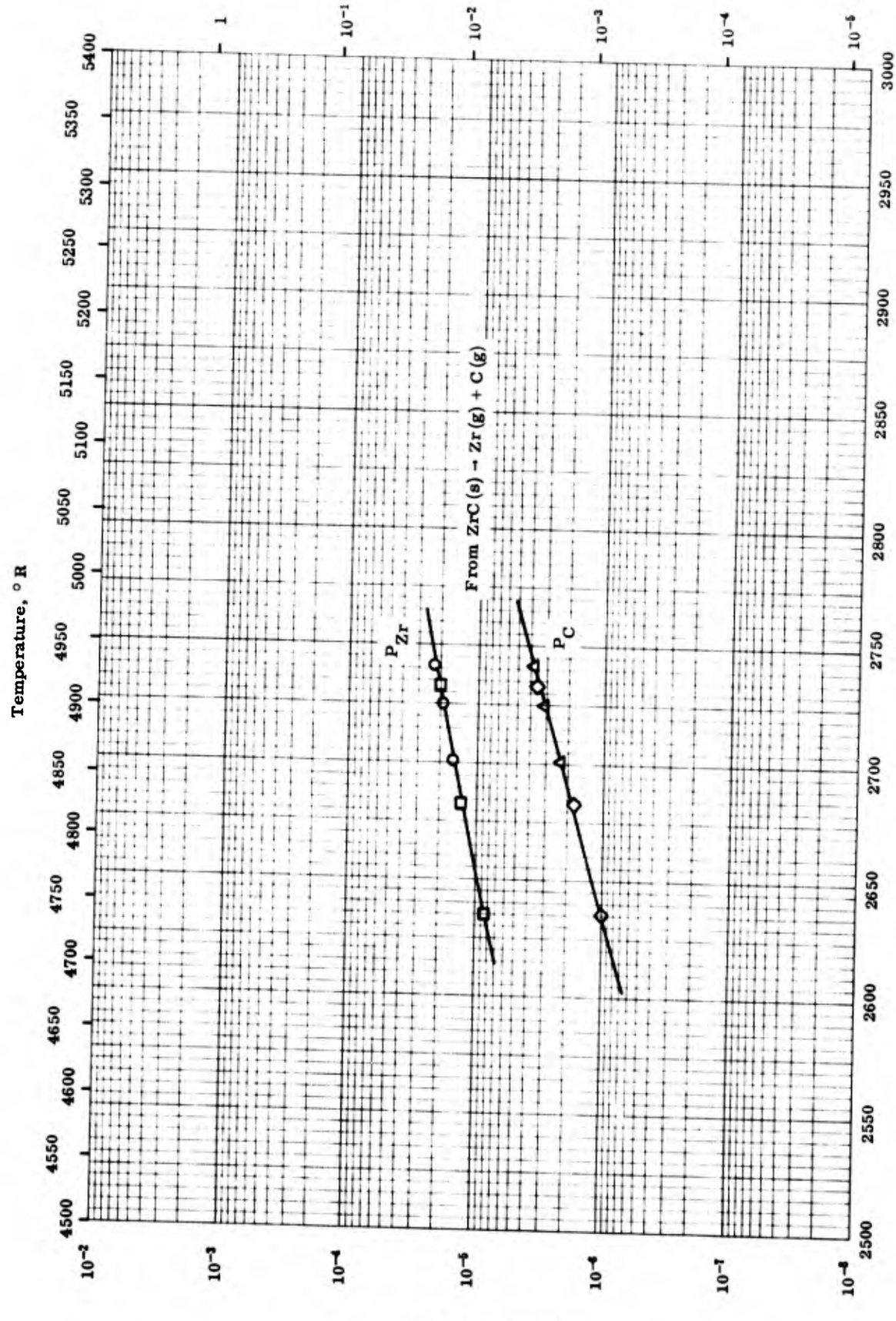
NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM CARBIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	61-5	2100	0.5–4.0		ZrC.	Polished; measured in vacuum at low temperature and in argon at 1 atm at high temperature.
△	61-5	2270	0.5–4.0		Same as above.	Same as above.
□	61-5	2470	0.5–4.0		Same as above.	Same as above.
▽	61-5	2670	0.5–4.0		Same as above.	Same as above.

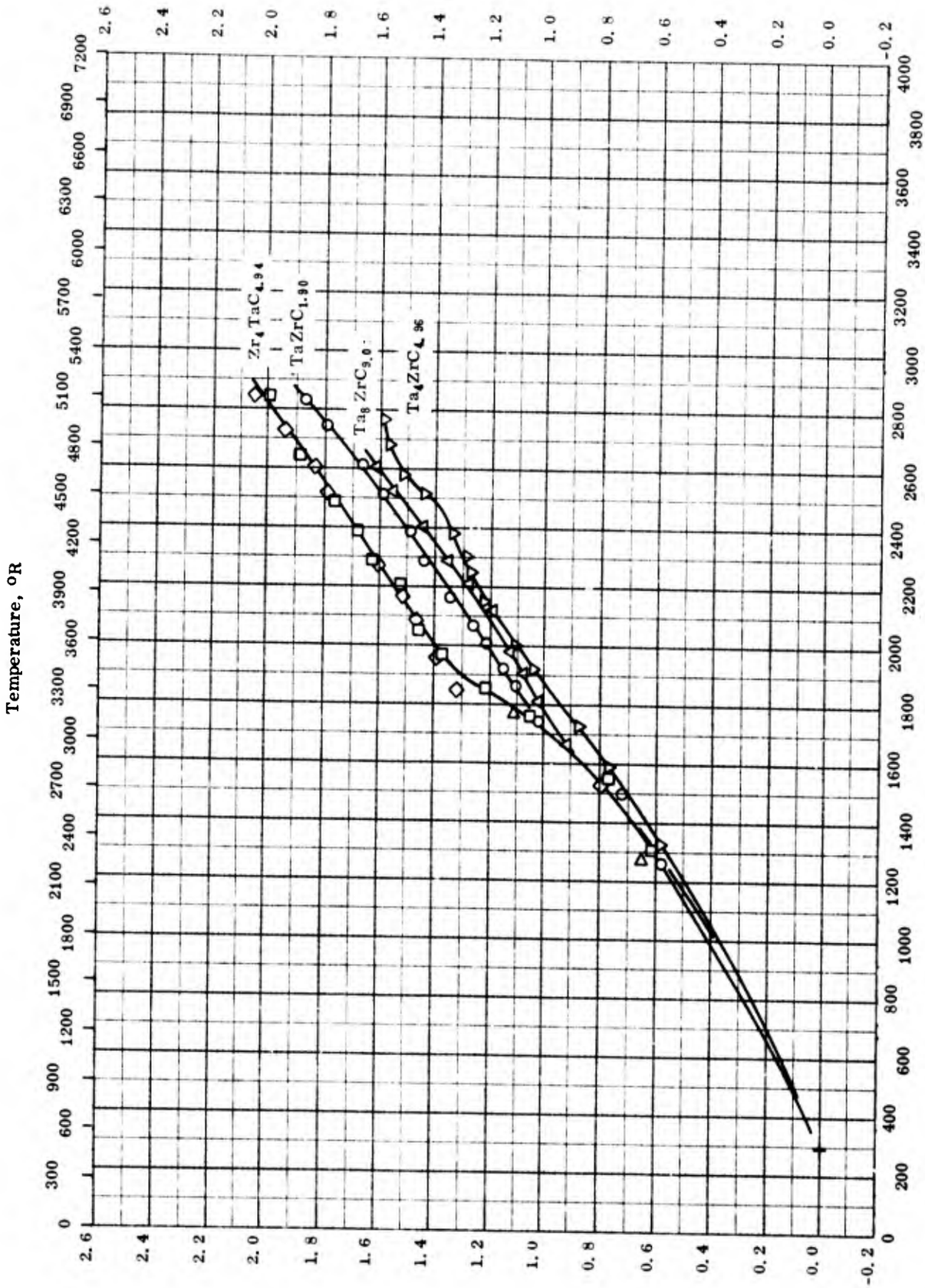


VAPOR PRESSURE -- ZIRCONIUM CARBIDE

VAPOR PRESSURE -- ZIRCONIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-1	2701-2726			Zr(g) from ZrC(s) → Zr(g) + C(g); accommodation coefficient assumed as 1.
□	57-1	2635-2732			Same as above.
△	57-1	2701-2726			C(g) from ZrC(s) → Zr(g) + C(g); accommodation coefficient assumed as 1.
◇	57-1	2635-2732			Same as above.



THERMAL LINEAR EXPANSION — ZIRCONIUM TANTALUM CARBIDES

THERMAL LINEAR EXPANSION — ZIRCONIUM TANTALUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-15	298-2832		Stoichiometry based on combined carbon $TaZrC_{1.00}$; 60.83 Ta, 31.07 Zr, 7.37 total C, 0.04 free C, 0.15 Fe, 0.03 Nb, 0.01 Si, <0.01 B, <0.005 Ti and Mn, 0.003 Al, <0.003 Ca, Cu, Cr, and <0.003 Mg; prepared from reactor grade zirconium oxide (99.30 ZrO_2 from The Carborundum Co.), tantalum pentoxide (99.67 Ta_2O_5 from Fansteel Metallurgical Corp.), and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.876 in.; density 9.55 g cm^{-3}, 89.2% theoretical density.	Prepared from ZrO_2 and Ta_2O_5 reacted with Thermatomic carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon atm parallel to hot pressing direction.
□	64-15	298-2842		Stoichiometry based on combined carbon $Zr_4TaC_{4.94}$; 61.27 Zr, 27.32 Ta, 9.31 total C, 0.05 free C, 0.15 Fe, 0.03 Si, <0.01 B, <0.005 Ti and Mn, <0.003 Cr, Cu, Ca, and Al, and <0.002 Mg; prepared from reactor grade zirconium oxide (99.30 ZrO_2 from The Carborundum Co.), tantalum pentoxide (99.67 Ta_2O_5 from Fansteel Metallurgical Corp.), and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.881 in.; density 7.11 g cm^{-3}, 85.5% theoretical density. [Author's design: Run 1]	Prepared from ZrO_2 and Ta_2O_5 reacted with Thermatomic carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; parallel to hot pressing direction.
◇	64-15	298-2848		Same as above. [Author's design: Run 2]	Same as above.

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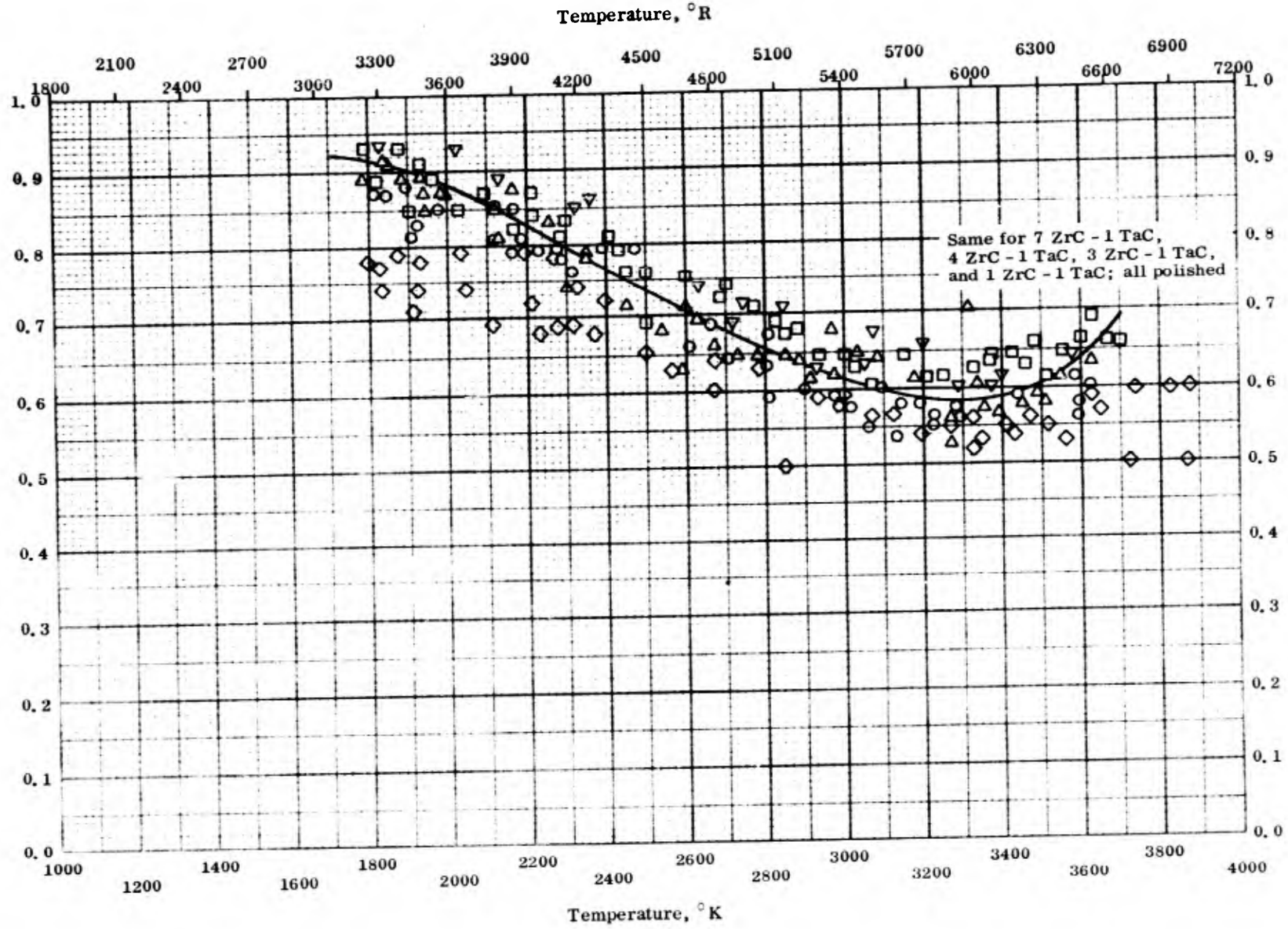
REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▽	64-15	298-2774		Stoichiometry based on combined carbon $Ta_4ZrC_{4.96}$; 82.18 Ta, 11.34 Zr, 6.96 tctal C, 0.41 free C, 1.0 Hf, 0.15 Fe, 0.1 Nb, 0.02 Si and W, 0.01 Ti, <0.01 B, 0.003 Mn, Cu, and Cr, <0.003 V, <0.002 Al, and <0.001 Mg, Ca; prepared from reactor grade zirconium oxide (99.30 ZrO_2 from The Carborundum Co.), tantalum pentoxide (99.67 Ta_2O_5 from Fansteel Metallurgical Corp.), and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.996 in.; density 11.23 g cm^{-3}, 89.9% theoretical density.	Prepared from ZrO_2 and Ta_2O_5 reacted with Thermatomic carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon atm perpendicular to hot pressing direction.
△	64-15	298-2603		Stoichiometry based on combined carbon $Ta_8ZrC_{9.01}$; 86.17 Ta, 5.76 Zr, 7.07 total C, 0.48 free C, 0.2 Nb, 0.12 Fe, <0.01 B, <0.02 Si, 0.005 Cu, 0.004 Al and Ti, 0.003 Mn, <0.003 Hf, W, and V, <0.002 Cr, and <0.001 Ca and Mg; prepared from reactor grade zirconium oxide (99.30 ZrO_2 from The Carborundum Co.), tantalum pentoxide (99.67 Ta_2O_5 from Fansteel Metallurgical Corp.), and Thermatomic carbon (manuf. by Thermatomic Carbon Co.); dimensions 1/8 by 1/8 by 2.878 in.; density 13.03 g cm^{-3}, 95.87% theoretical density.	Prepared from ZrO_2 and Ta_2O_5 reacted with Thermatomic carbon, cold pressed into briquets using polyvinyl alcohol as temporary binder, reaction sintered in argon atm, crushed and screened to 44 μ, hot pressed at 2150 C and 4500 psi, and cut from center of pressings; measured in argon atm perpendicular to hot pressing direction.
▷	63-29	293-2273		8 TaC·ZrC.	Measured in inert atm with pressure of approx 1 in. water above atm pressure.



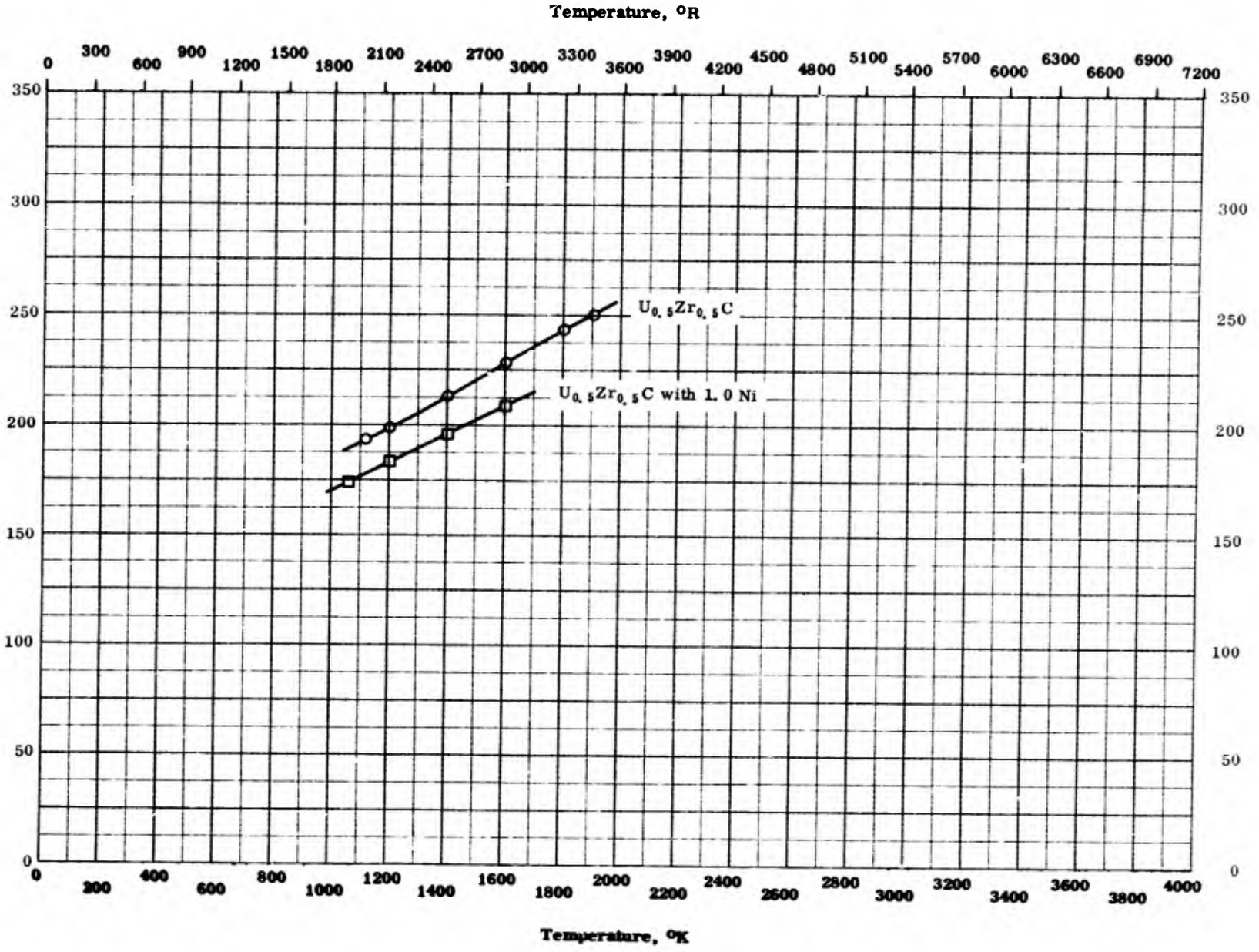
NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM TANTALUM CARBIDES

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM TANTALUM CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range, °K	Rept. Error%	Sample Specifications	Remarks
○	61-9	0.65	1813-3623		Solid solution of 7 ZrC - 1 TaC.	Polished with 400 grit diamond wheel.
△	61-9	0.65	1783-3613		Solid solution of 4 ZrC - 1 TaC.	Same as above.
□	61-9	0.65	1788-3703		Solid solution of 3 ZrC - 1 TaC.	Same as above.
▽	61-9	0.65	1825-3673		Solid solution of ZrC - 1 TaC.	Same as above.
◇	61-9	0.65	1798-3873		Solid solution of 3 TaC - 1 ZrC.	Same as above.



ELECTRICAL RESISTIVITY -- ZIRCONIUM URANIUM CARBIDE

ELECTRICAL RESISTIVITY -- ZIRCONIUM URANIUM CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	62-8	1060-1600	± 2.0	$U_{0.5}Zr_{0.5}C$ with 1.0 Ni; prepared from -325 mesh ZrC and UC powder.	Hot-pressed in graphite at 2000 K and 6000 psi for 15 min. from mixed ZrC and UC powders.
○	62-8	1115-1900	± 2.0	Same as above except Ni evaporated by holding at 2000 K for about 2 hrs.	Same as above; sample broke at about 2000 K.

PROPERTIES OF OTHER METAL CARBIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	La_2C_3	6.079	379.3
	LaC_2	5.35	333.8
	β-LaC_2	5.0	312.0
	Ce_2C_3	6.97	434.9
	CeC_2	5.40	337.0
	Pr_2C_3	6.021	375.6
	PrC_2	5.728	357.4
	Nd_2C_3	6.902	430.7
	NdC_2	5.970	372.5
	Sm_2C_3	7.477	466.6
	SmC_2	6.48	404.4
	Gd_2C_3	8.024	500.7
	GdC_2	6.93	432.4
	Tb_2C_3	8.335	520.1
	TbC_2	7.176	447.8
	DyC_2	7.45	464.9
	Ho_2C_3	8.892	554.9
	HoC_2	7.701	480.5
	ErC_2	7.954	496.3
	TmC_2	8.175	510.1
	YbC_2	8.097	505.3
	LuC_2	8.728	544.6
	ScC	3.59	224.0
	Y_3C	3.41	212.8
	YC_2	4.528	282.5
◀	Li_4C_2	1.65	103

Melting Point		K	R
▽	Co_3C	2573	4632
	Ni_3C	2373	4272
◇	Al_4C_3	2373	4272
●	BaC_2	2300 ± 300	4140 ± 540
▼	GdC_2	2473	4452
	NdC_2	>2273	>4092
	SmC_2	2473	4452

(Continued onto next page)

PROPERTIES OF OTHER METAL CARBIDES (Continued)

REPORTED VALUES

Melting Point		K	R
◆	YC*	2223 ± 20*	4002 ± 36*
◁	Y_2C_3	2073 ± 20	3732 ± 36
▷	YC_2	2573 ± 50*	4632 ± 90*
□	YC_2	2343 ± 30	4220 ± 50
△	YC	3100	5580

*Most probable value for this compound.

PROPERTIES OF OTHER METAL CARBIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Carbides of rare earth metals.	
□	57-27	2313-2373		YC_2	Visual observation under N_2; calibrated optical pyrometer.
△	56-11	3100		YC	
▽	57-28	2573		CoC	Decomposing temperature.
		2373		Ni_3C	Same as above.
◇	52-10	2373		Al_4C_3	Same as above.
●	32-1	2000-2600		BaC_2	Same as above.
▼	59-20	2473		GdC_2	Same as above.
		>2273		NdC_2	Same as above.
		2473		SmC_2	Same as above.
◆	61-25	2203-2243		YC	
◁	62-50	2053-2093		Y_2C_3	
▷	62-50	2523-2623		YC_2	
◀	61-21	291		Li_4C_2	

PROPERTIES OF SILICON CARBIDE + BORON CARBIDE

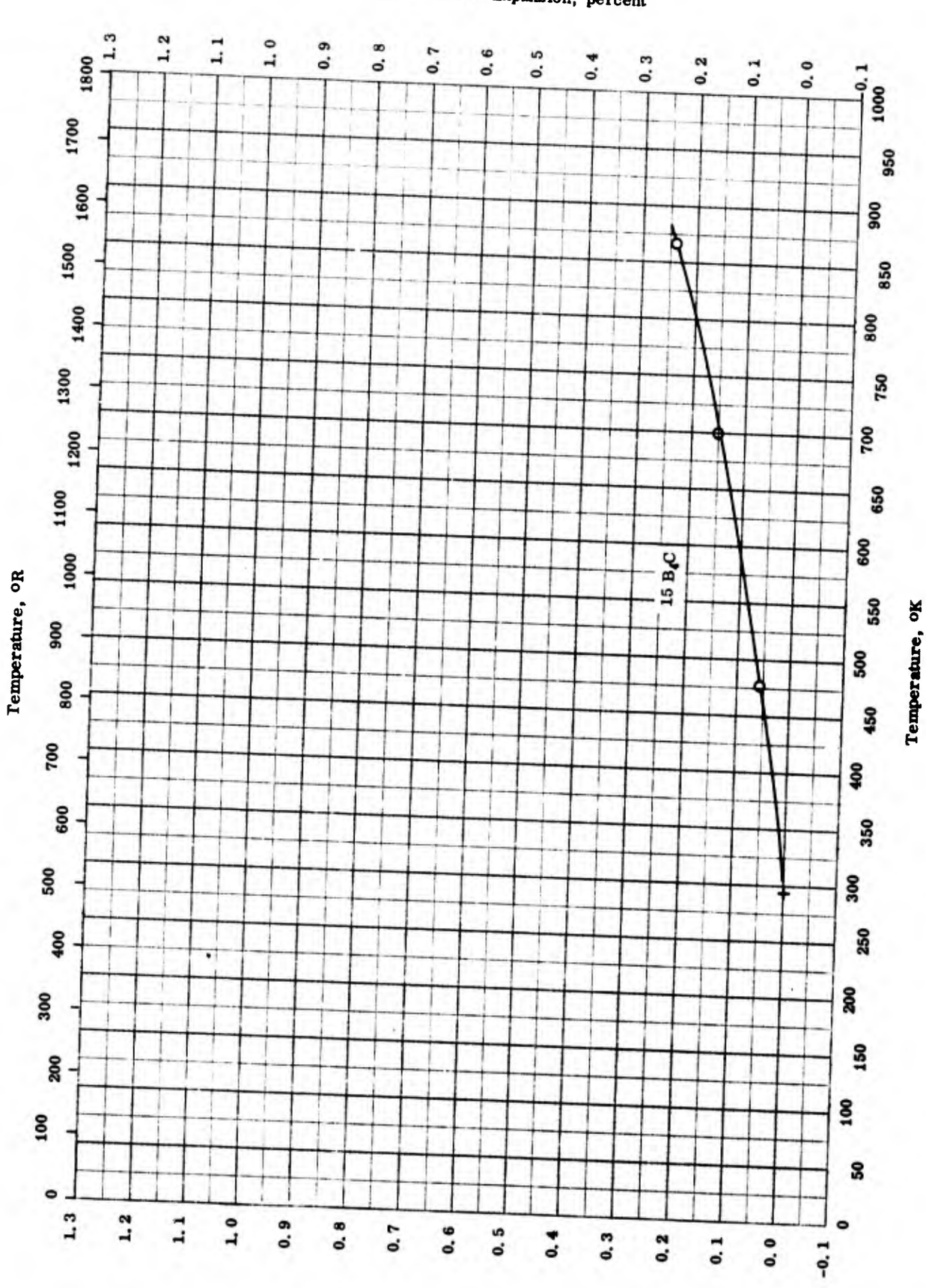
REPORTED VALUES

Density	g cm^{-3}	lb ft^{-3}
O 15 B_4C	3.00	187

PROPERTIES OF SILICON CARBIDE + BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	50-8	298		85 silicon carbide and 15 boron carbide; 59.89 Si, 14.36 B, 22.21 combined C, and 3.02 free C.	Hot-pressed; density from weight in air and in distilled water.

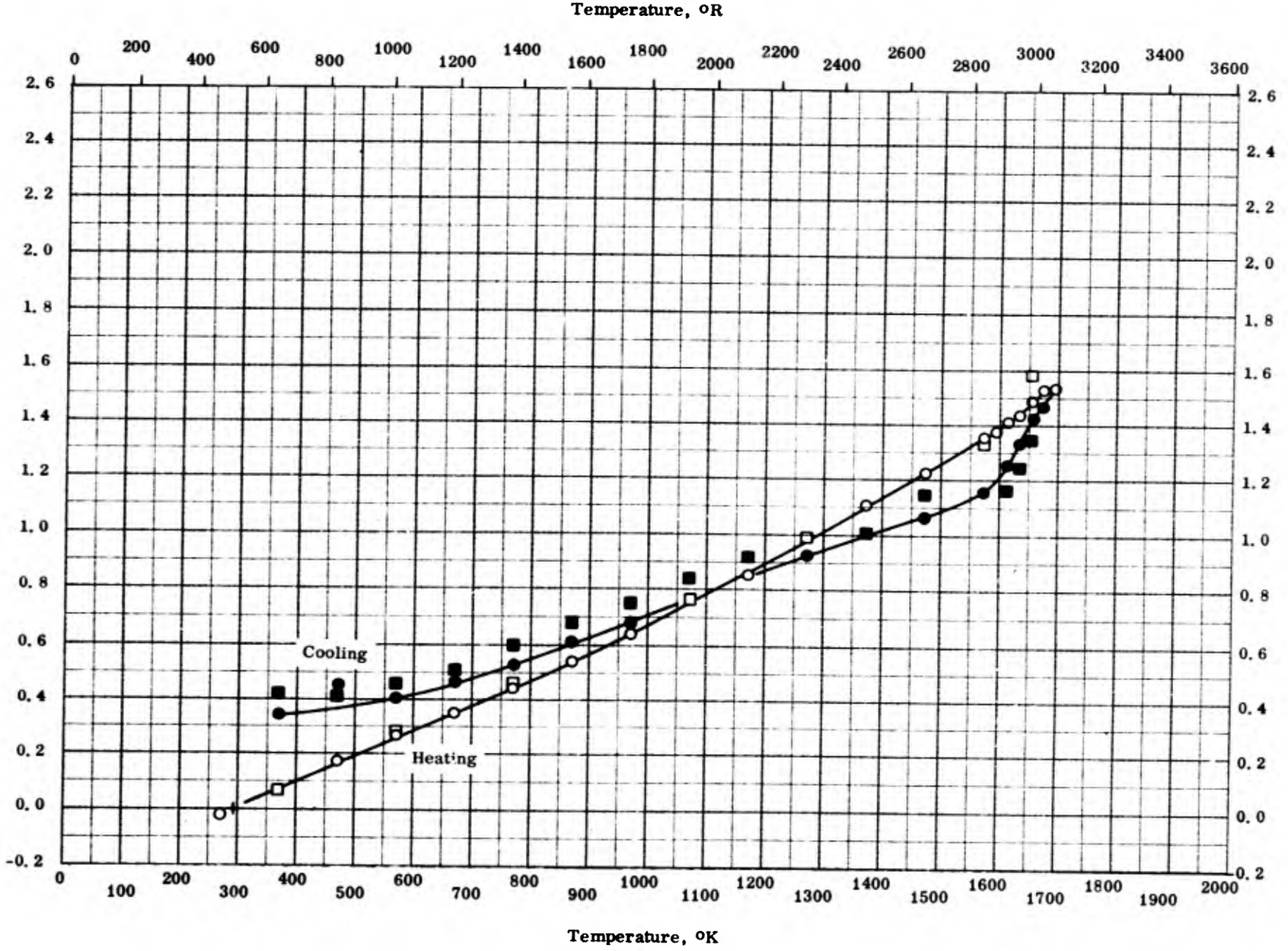


THERMAL LINEAR EXPANSION -- SILICON CARBIDE + BORON CARBIDE

THERMAL LINEAR EXPANSION -- SILICON CARBIDE + BORON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	50-8	300-867		Approx 85 SiC and 15 B_4C; analyzed as 59.89 Si, 22.21 combined C, 14.36 B. and 3.02 free C; density 187.2 lb ft^{-3}.	Hot pressed in graphite mold; tested at 4 C min^{-1} rise.



THERMAL LINEAR EXPANSION -- THORIUM CARBIDE + URANIUM DICARBIDE

THERMAL LINEAR EXPANSION -- THORIUM CARBIDE + URANIUM DICARBIDE

REFERENCE INFORMATION

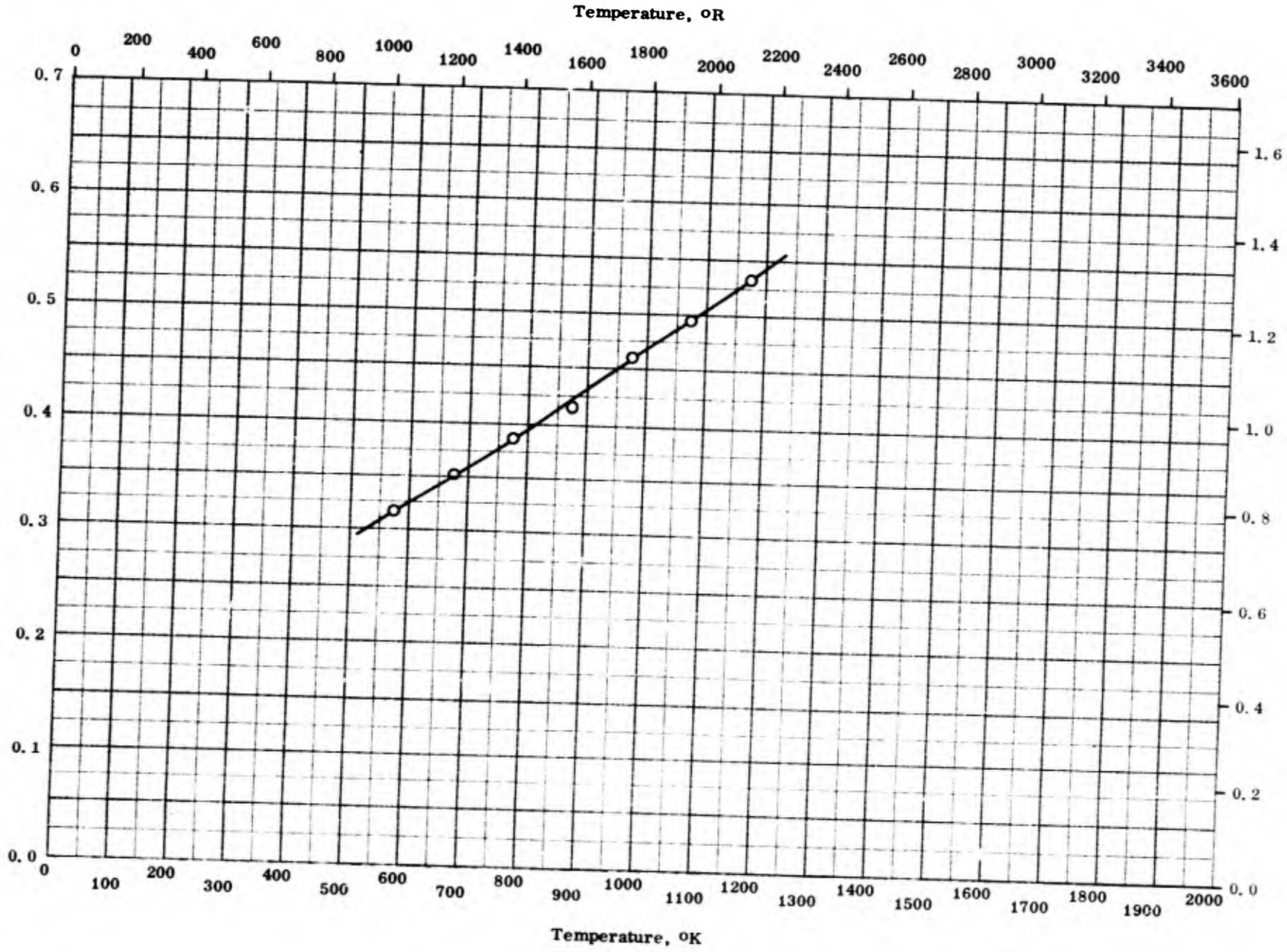
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-28	273-1693		ThC_2 and UC_2 with weight ratio of Th/U = 20/1.	Measured with heating rate of 150 C hr^{-1}.
●	63-28	373-1693		Same as above.	Cooling cycle for above sample.
□	63-28	273-1673		Same as above.	Second heating cycle for above sample.
■	63-28	373-1693		Same as above.	Second cooling cycle for above sample.

SPECIFIC HEAT -- BERYLLIUM CARBIDE + ΣX_i

SPECIFIC HEAT -- BERYLLIUM CARBIDE + ΣX_i

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	5u-2	473-1373	± 10-15	Composition before test: 80 pure Be_2C with most oxides and nitrides impurities, and after test: 74 Be_2C.	

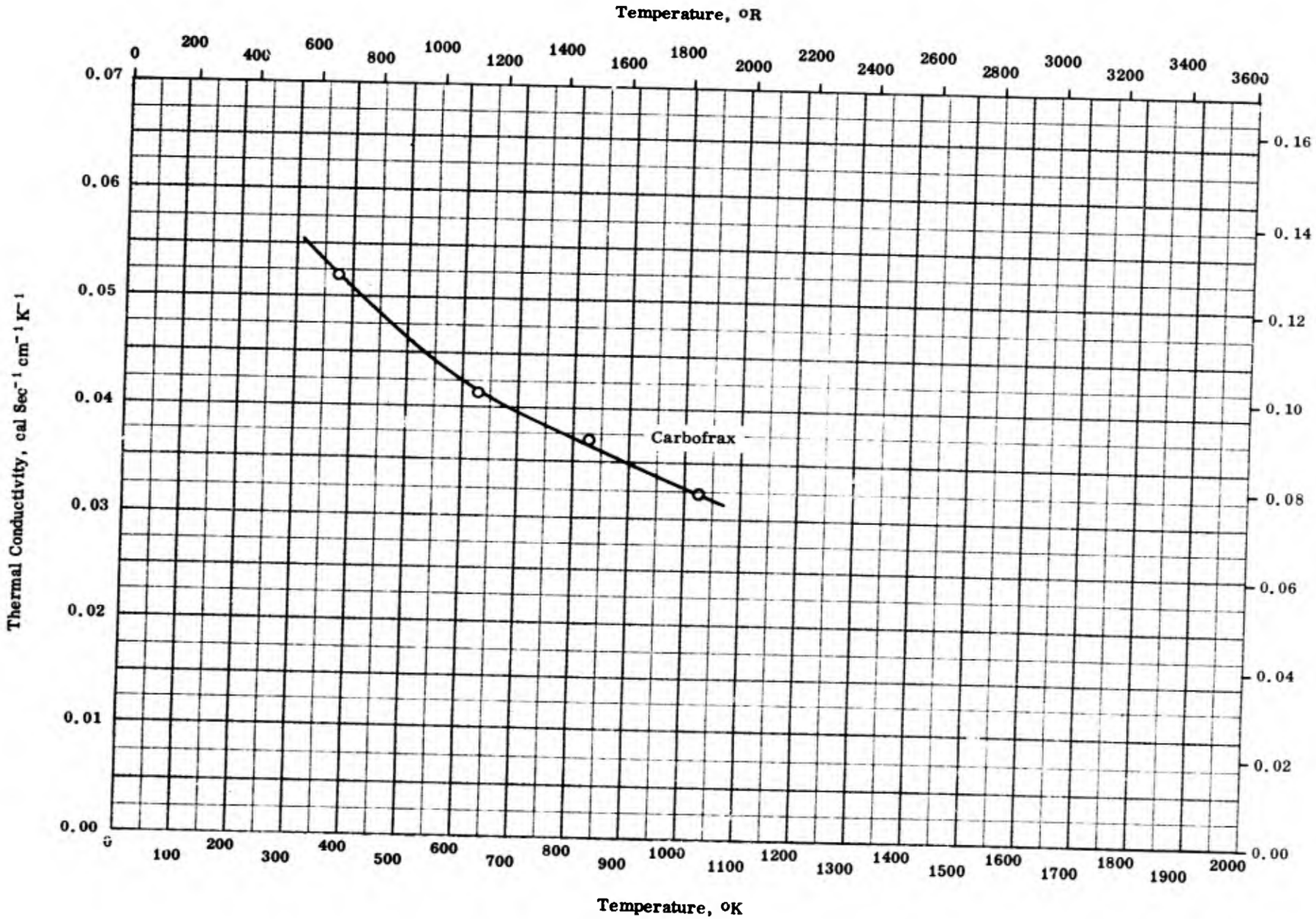


THERMAL CONDUCTIVITY -- BERYLLIUM CARBIDE + ΣX_i

THERMAL CONDUCTIVITY -- BERYLLIUM CARBIDE + ΣX_i

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	50-2 and 48-2	573-1173	±200	80 Be_2C; impurities mostly BeO and Be_3N_2.	

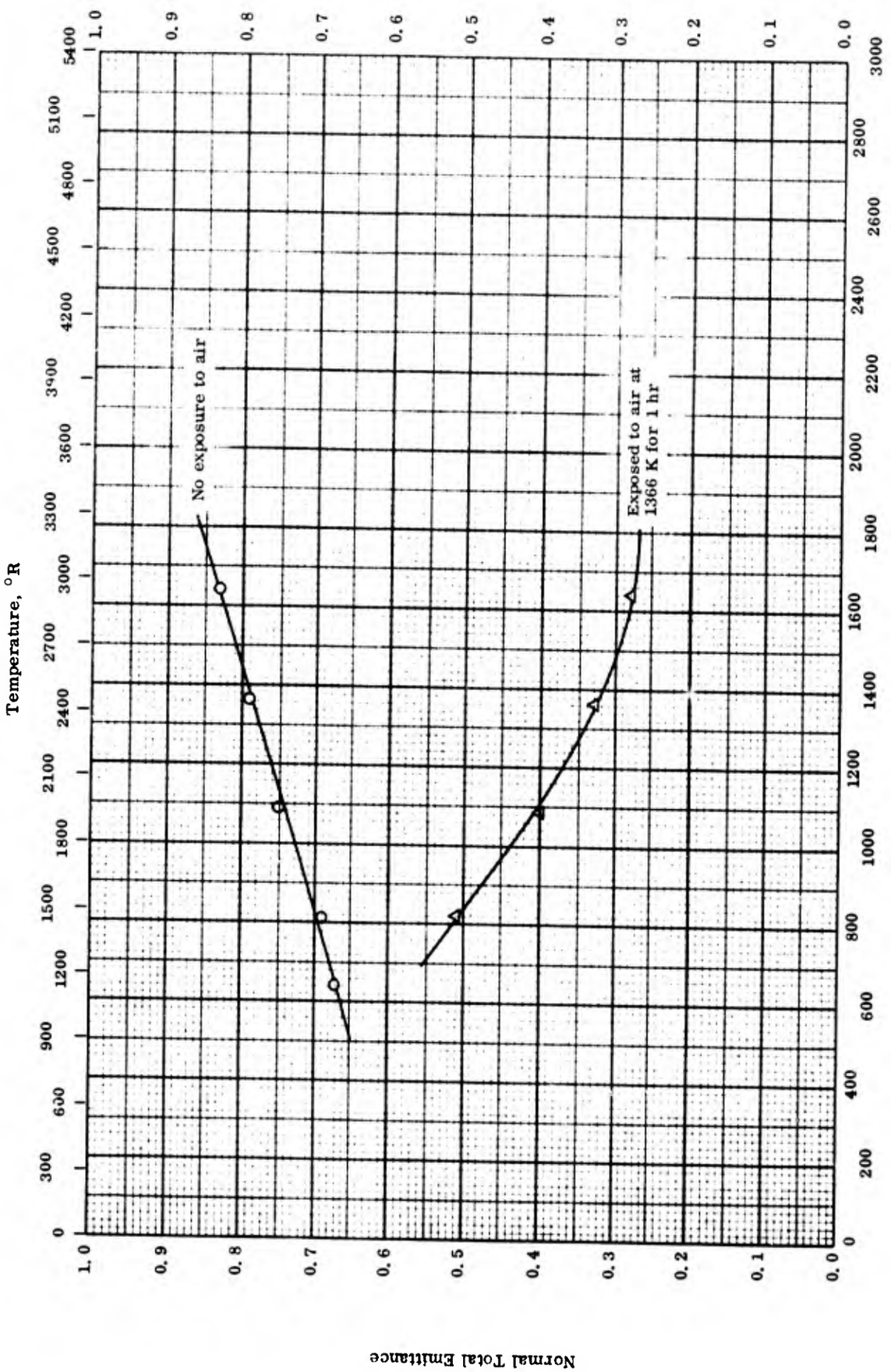


THERMAL CONDUCTIVITY -- SILICON CARBIDE + ΣX_i

THERMAL CONDUCTIVITY -- SILICON CARBIDE + ΣX_i

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-2	373-1023		Carbofrax from Carborundum Co.; 89 SiC; 16.52% porosity.	

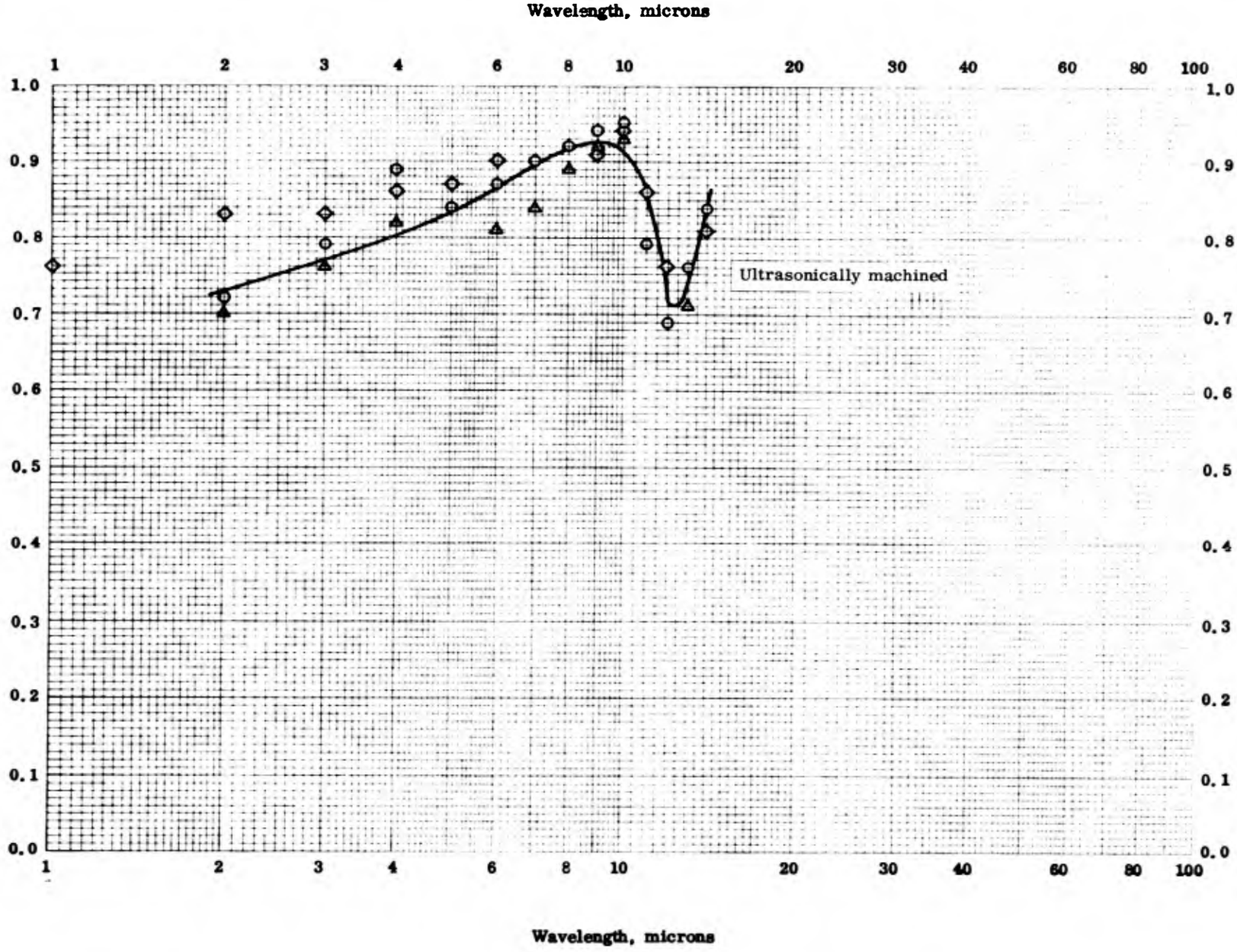


NORMAL TOTAL EMITTANCE -- SILICON CARBIDE + ΣX_i

NORMAL TOTAL EMITTANCE -- SILICON CARBIDE + ΣX_i

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-11	644-1644	± 20	SiC, 92-98 pure; 2-8 free silicon and 0-5 free carbon.	Dry pressed, heated to 408 K for 24 hrs; surface finish 63; purge with moisture removed helium.
Δ	60-11	811-1644	± 20	Same as above.	Same as above; exposed to still air at 1366 K for 1 hr.



NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE + ΣX_i

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- SILICON CARBIDE + ΣX_i

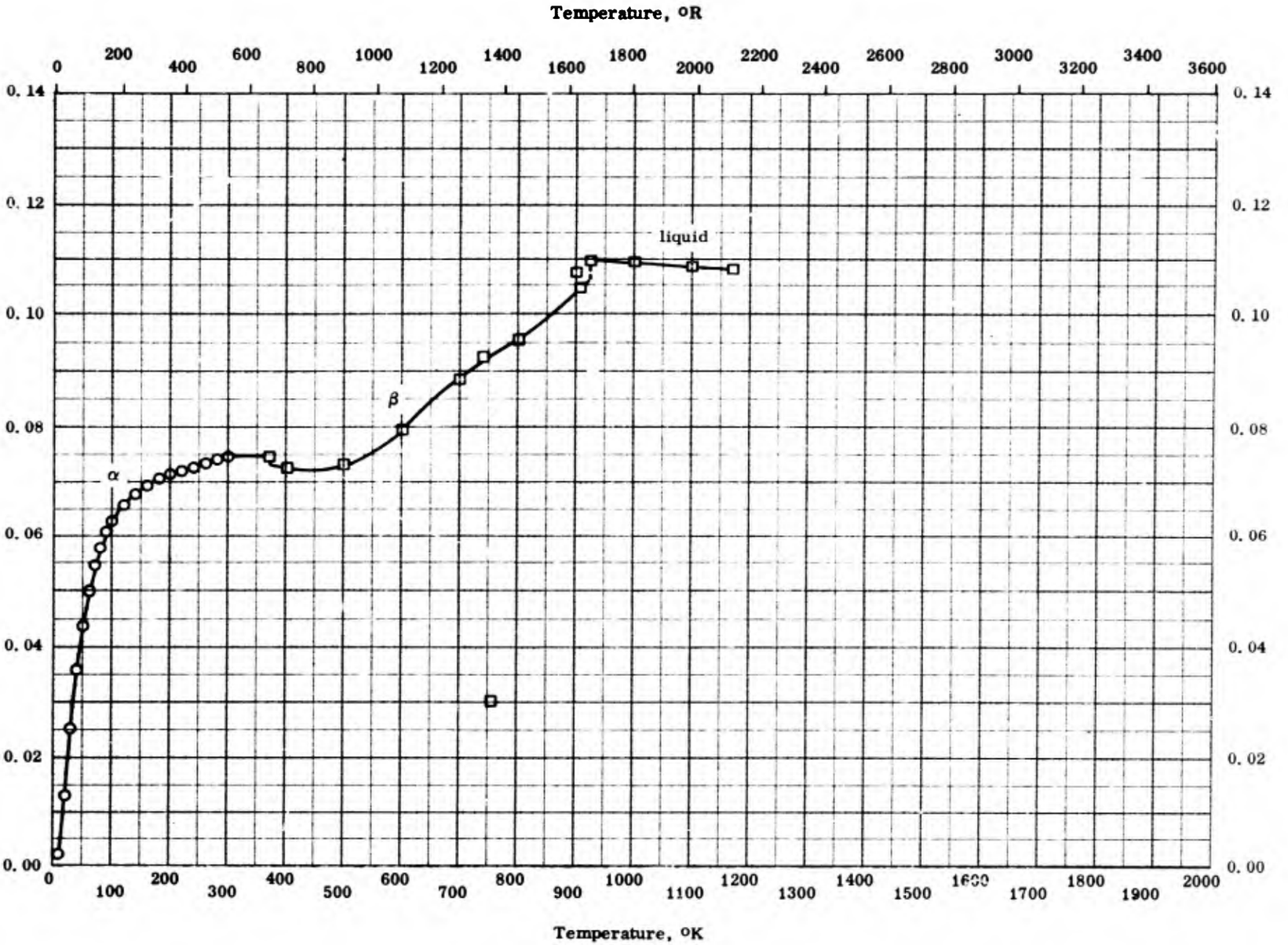
REFERENCE INFORMATION

Symbol	Ref.	Temp. ° K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	60-15	873	2-14	4	80 SiC, RC-4237 from Norton, nitride bonded.	Ultrasonically machined.
△	60-15	1073	2-14	4	Same as above.	Same as above.
◇	60-15	1293	1-14	4	Same as above.	Same as above.

CHLORIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple chlorine compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is < 95.0 percent, or any other constituent is > 2.0 percent.



SPECIFIC HEAT -- CESIUM CHLORIDE

SPECIFIC HEAT -- CESIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-24	7-300	0.3	99.99 CsCl and 0.001-0.01 each al, Ca, Na, K, and Rb.	Recrystallized several times from water and dried several hrs. under vacuum at 260-300 C.
□	61-17	298-900		99.80 CsCl, 0.1>Na, 0.1 >K, and 0.01 >Ca.	Nesublimed ; dried under vacuum several hrs.

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PROPERTIES OF LITHIUM CHLORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.068*	129.04*
Melting Point	887*	1596*
Heat of Vaporization . . .	2089	3760
Heat of Sublimation . . .	1203	2165

*Handbook of Chemistry and Physics (Ref. 64-18)

REPORTED VALUES

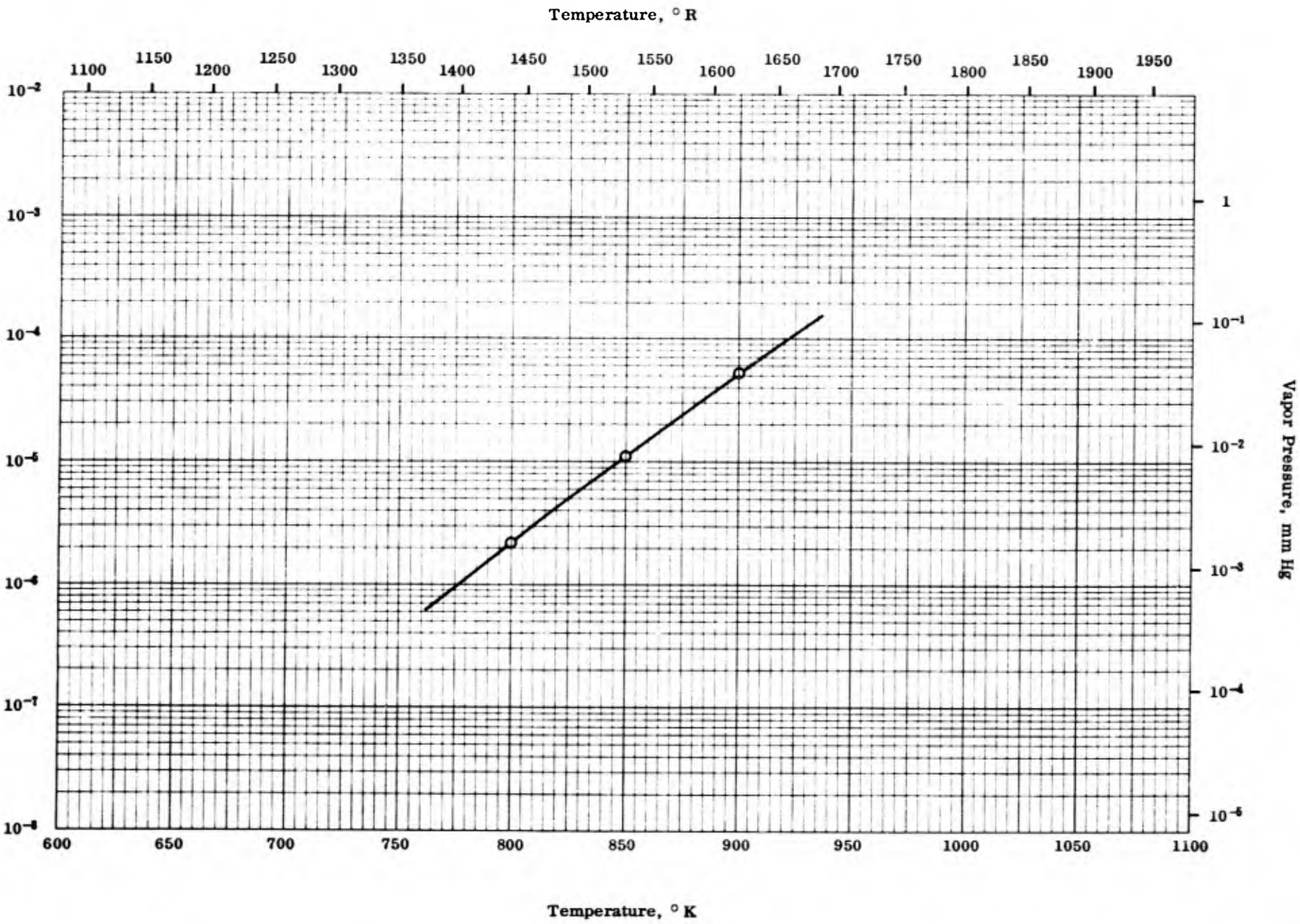
Heat of Vaporization		cal g^{-1}	Btu lb^{-1}
	○	2089	3760

Heat of Sublimation		cal g^{-1}	Btu lb^{-1}
	□	1217	2191
	△	626	1127
	◇	613	1103
	▽	1203	2165

PROPERTIES OF LITHIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	298		Not given.	
□	63-5	298		Li Cl monomer.	
△	63-5	298		Li_2Cl_2, dimer.	
◇	64-2	298		Li_2Cl_2 dimer.	
▽	64-2	298		LiCl monomer.	



VAPOR PRESSURE -- LITHIUM CHLORIDE

VAPOR PRESSURE -- LITHIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-2	800-900	10.0	Reagent grade LiCl; dimer to monomer ratio 2.3.	For solid (798-877 K) log P (atm) = (6.872 ± 0.099) - (10020 ± 83) T^{-1}. For liquid (881-921 K) log P (atm) = (5.031 ± 0.148) - (8387 ± 134) T^{-1}.

PROPERTIES OF MAGNESIUM CHLORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.316-2.33*	144.5-145*
Melting Point	987	1776

*Handbook of Chemistry and Physics, (Ref. 64-18)

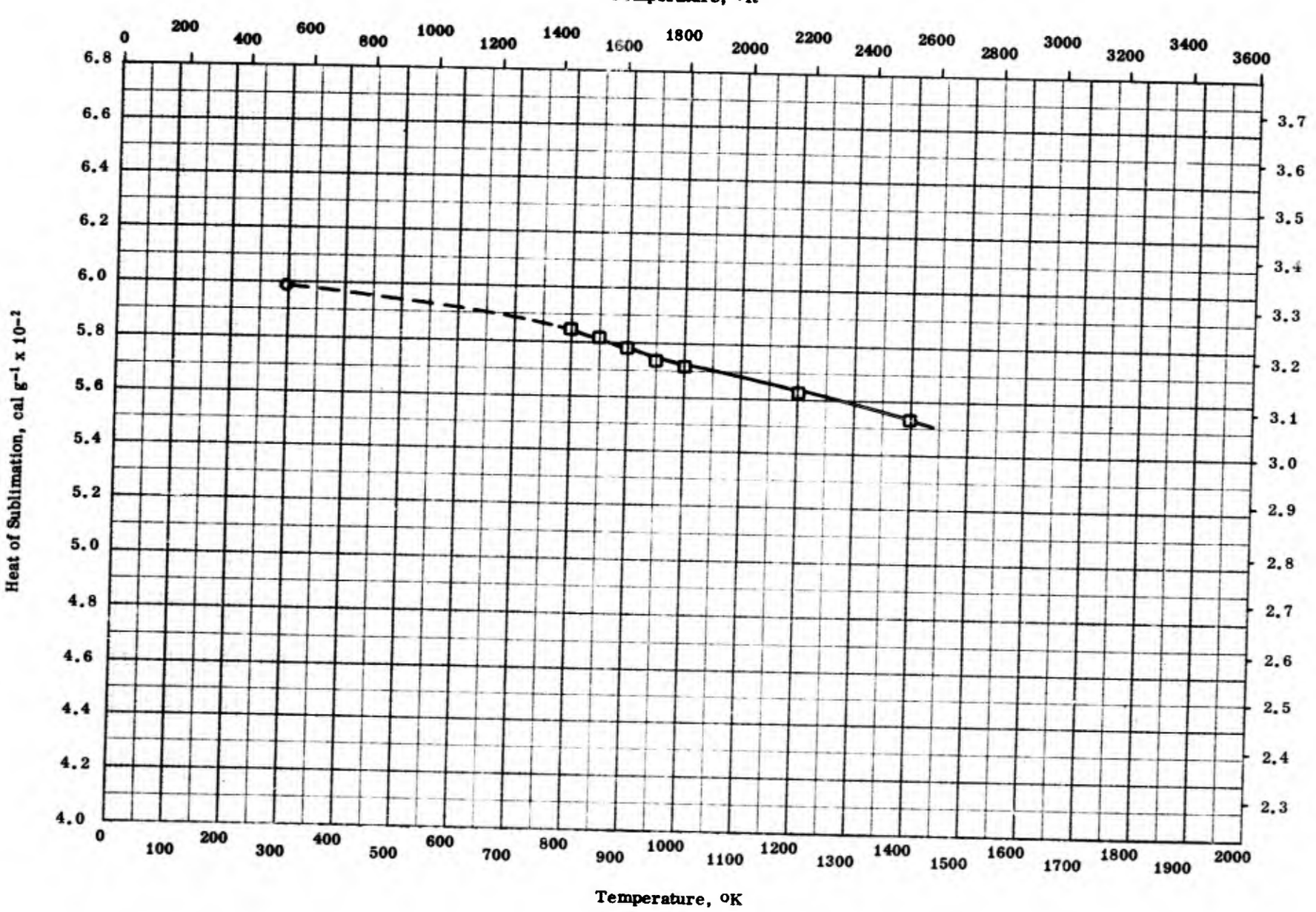
REPORTED VALUES

		K	R
Melting Point:	O	987	1776
Heat of Sublimation:		See figure	

PROPERTIES OF MAGNESIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-2	987		$MgCl_2$	Two samples: (1) Dehydration of reagent grade $MgCl_2 \cdot 6H_2O$ in a stream of HCl at 500 C. (2) Magnesium reduction of $ZrCl_4$.

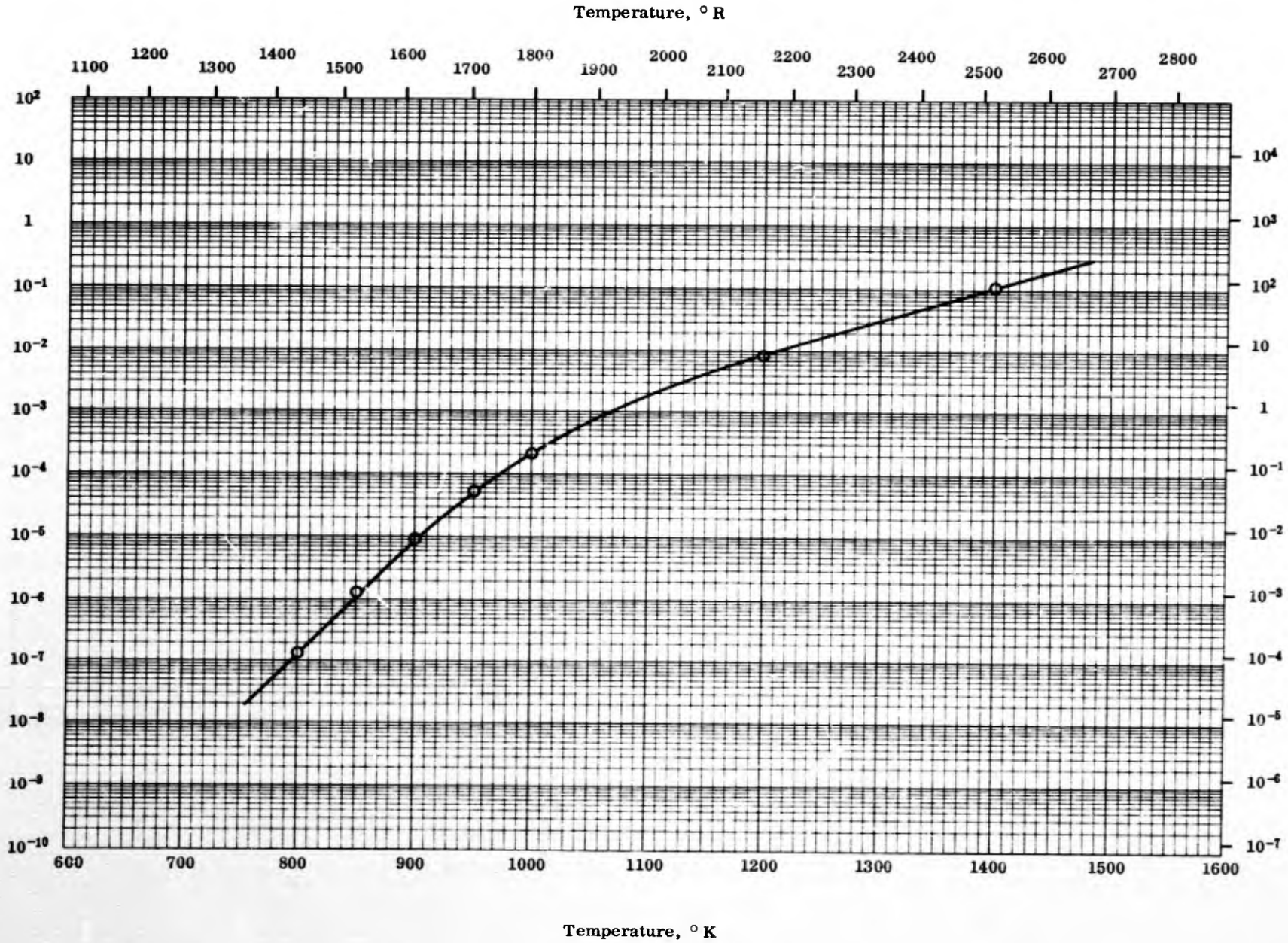


HEAT OF SUBLIMATION -- MAGNESIUM CHLORIDE

HEAT OF SUBLIMATION -- MAGNESIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-5	298		$MgCl_2$.	
□	64-2	800-1400		$MgCl_2$.	Two samples prepared: 1. Dehydration of reagent grade $MgCl_2 \cdot 6H_2O$ in a stream of HCl at 500 C. 2. Magnesium reduction of $ZrCl_4$.



VAPOR PRESSURE -- MAGNESIUM CHLORIDE

VAPOR PRESSURE -- MAGNESIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-2	800-1400	10.0	$MgCl_2$; melting point 987 K.	Two samples: (1) sample made by dehydration of reagent grade $MgCl_2 \cdot 6H_2O$ in a stream of HCl at 500 C. (2) by magnesium reduction of $ZrCl_4$.

PROPERTIES OF PLUTONIUM TRICHLORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	5.70	356
Melting Point	1033	1860
Heat of Fusion	43.6	78.5
Heat of Vaporization . . .	134.2	241.5
Heat of Sublimation . . .	242.1_{0K}	435.8_{DR}

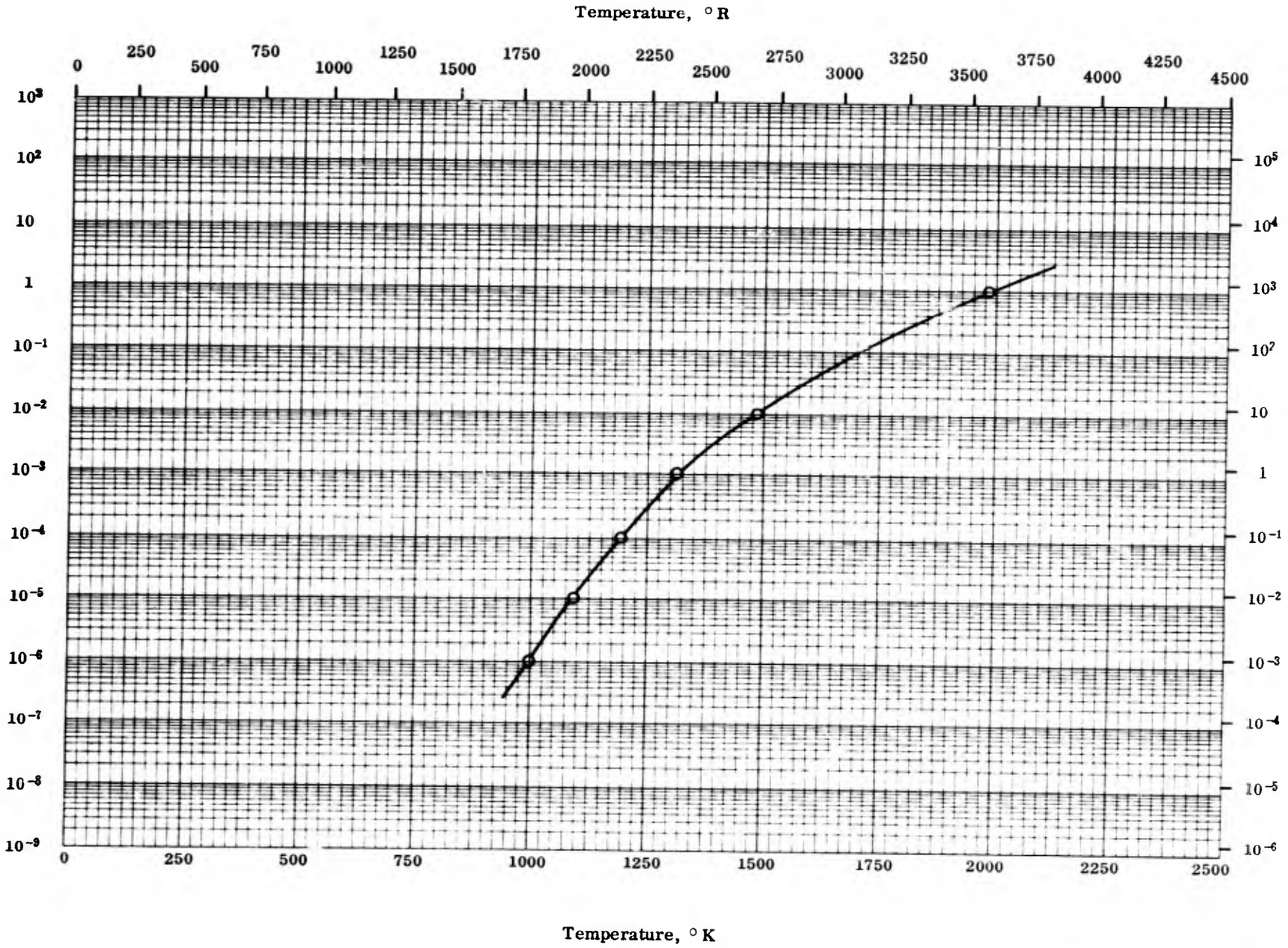
REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
	▽	5.70	536
Melting Point		K	R
	○	1033 ± 5	1860 ± 9
Heat of Fusion		cal g^{-1}	Btu lb^{-1}
	□	43.6	78.5
Heat of Vaporization		cal g^{-1}	Btu lb^{-1}
	△	204.4_{0K}	368.0_{0R}
	▷	$134.2_{2040\ K\ (B.P.)}$	$241.5_{3672\ R\ (B.P.)}$
Heat of Sublimation		cal g^{-1}	Btu lb^{-1}
	◁	242.1_{0K}	435.8_{0R}

PROPERTIES OF PLUTONIUM TRICHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▽	49-9	298		$PuCl_3$.	Density computed from x-ray measurement of lattice.
○	49-1	1028-1038		$PuCl_3$.	
□	49-1	---		$PuCl_3$	
△	49-1	0		$PuCl_3$	
▷	49-1	2040		$PuCl_3$	
◁	49-1	0		$PuCl_3$.	

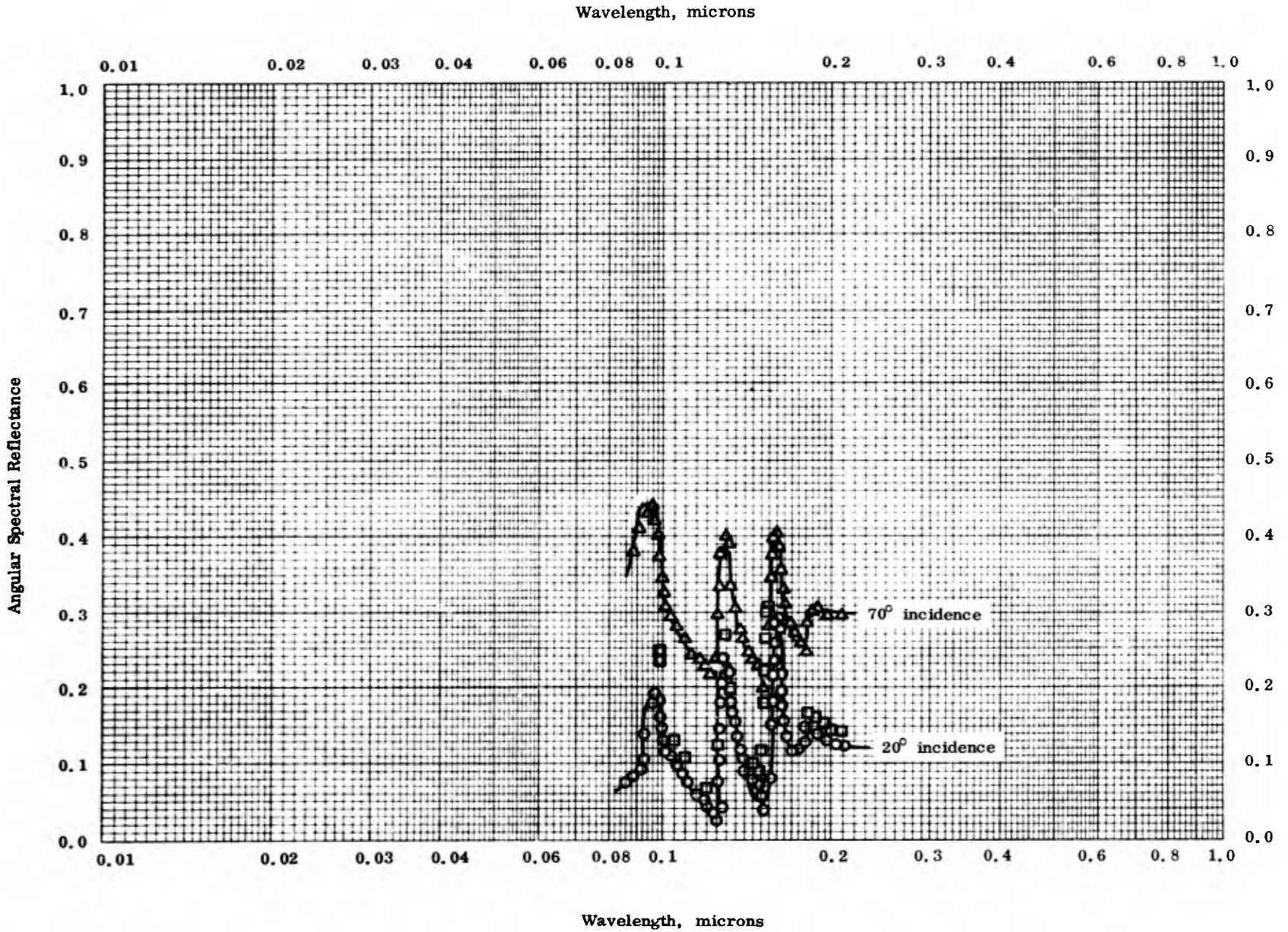


VAPOR PRESSURE -- PLUTONIUM TRICHLORIDE

VAPOR PRESSURE -- PLUTONIUM TRICHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	49-1	1000-1985		$PuCl_3$.	

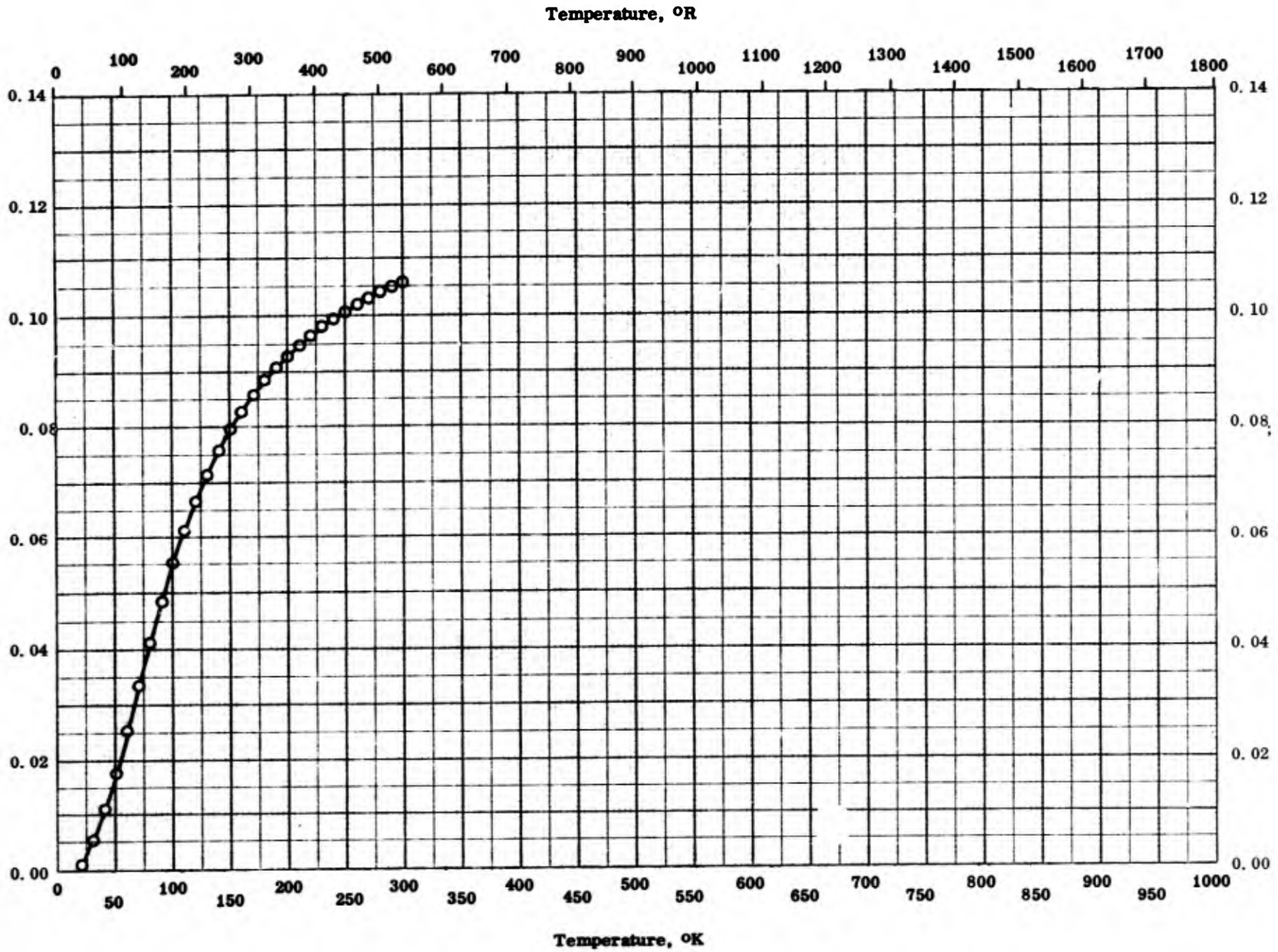


ANGULAR SPECTRAL REFLECTANCE -- POTASSIUM CHLORIDE

ANGULAR SPECTRAL REFLECTANCE -- POTASSIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	63-22	298	0.08-0.20		KCl.	Cleaved crystal in unpolarized light; 20 degree incidence, hemispherical viewing.
□	63-22	298	0.08-0.20		Same as above.	Same as above; 50 degree incidence, hemispherical viewing.
△	63-22	298	0.08-0.20		Same as above.	Same as above; 70 degree incidence, hemispherical viewing.



SPECIFIC HEAT -- STRONTIUM CHLORIDE

SPECIFIC HEAT -- STRONTIUM CHLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-23	7-300		$SrCl_2$; 0.0005 - 0.005 Na, 0.0002 - 0.002 each, Al, Ba and Ca and traces of Cu, Mg and Mn.	Recrystallized and dried 3 hrs at 600 C.

PROPERTIES OF URANIUM CHLORIDES

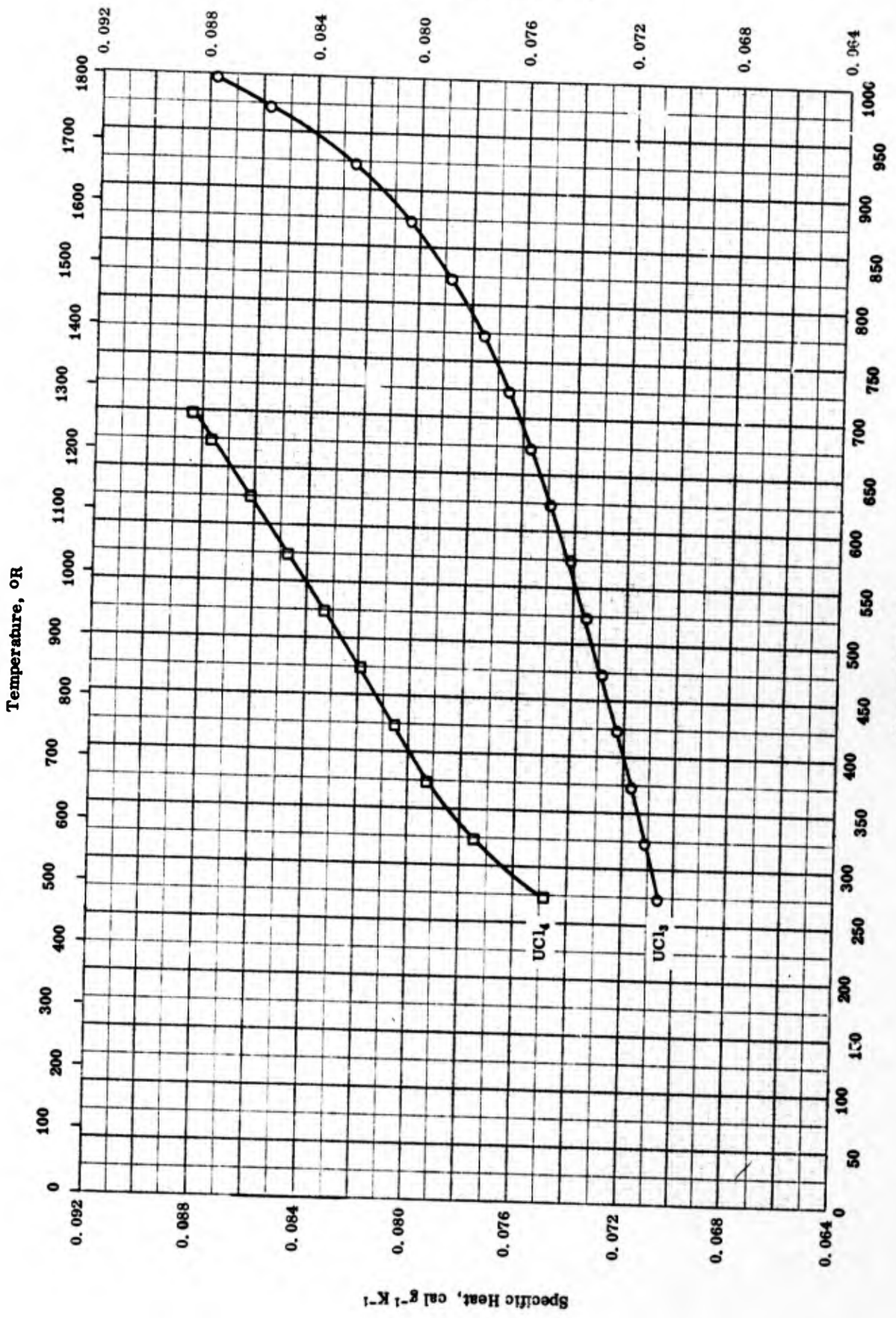
REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
O	UCl_3	5.51	344
□	UCl_4	4.87	304

PROPERTIES OF URANIUM CHLORIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-9	298		UCl_3.	Computed from x-ray measurement of lattice.
□	49-9	298		UCl_4.	



SPECIFIC HEAT -- URANIUM CHLORIDES

SPECIFIC HEAT -- URANIUM CHLORIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	47-2	273-998		99.5 UCl_3, 0.02 Na, 0.013 Fe, 0.01 Ca, 0.01 Mg, 0.006 Si and balance U (probably as oxides).	
□	47-2	273-698		99.5 UCl_4.	

PROPERTIES OF OTHER METAL CHLORIDES

REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
○	$CeCl_3$	3.95	247
□	$LaCl_3$	3.84	240
△	$NdCl_3$	4.14	258
◇	$PrCl_3$	4.02	251
●	$ThCl_4$	4.60	287
■	$NpCl_3$	5.58	348
◆	$NpCl_4$	4.92	307

PROPERTIES OF OTHER METAL CHLORIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-9	298		$CeCl_3$.	Computed from x-ray measurements of lattice.
□	49-9	298		$LaCl_3$.	Same as above.
△	49-9	298		$NdCl_3$.	Same as above.
◇	49-9	298		$PrCl_3$.	Same as above.
●	49-9	298		$ThCl_4$.	Same as above.
▲	49-9	298		$NpCl_3$.	Same as above.
◆	49-9	298		$NpCl_4$.	Same as above.

FLUORIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple fluorine compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

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PROPERTIES OF AMERICIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	9.53*	595*
Heat of Vaporization . . .	$269_{2690\,K}$	$362_{4840\,R}$
Heat of Sublimation . . .	$378_{0\,K}$	$680_{0\,R}$

*Handbook of Chemistry and Physics (Ref. 64-18)

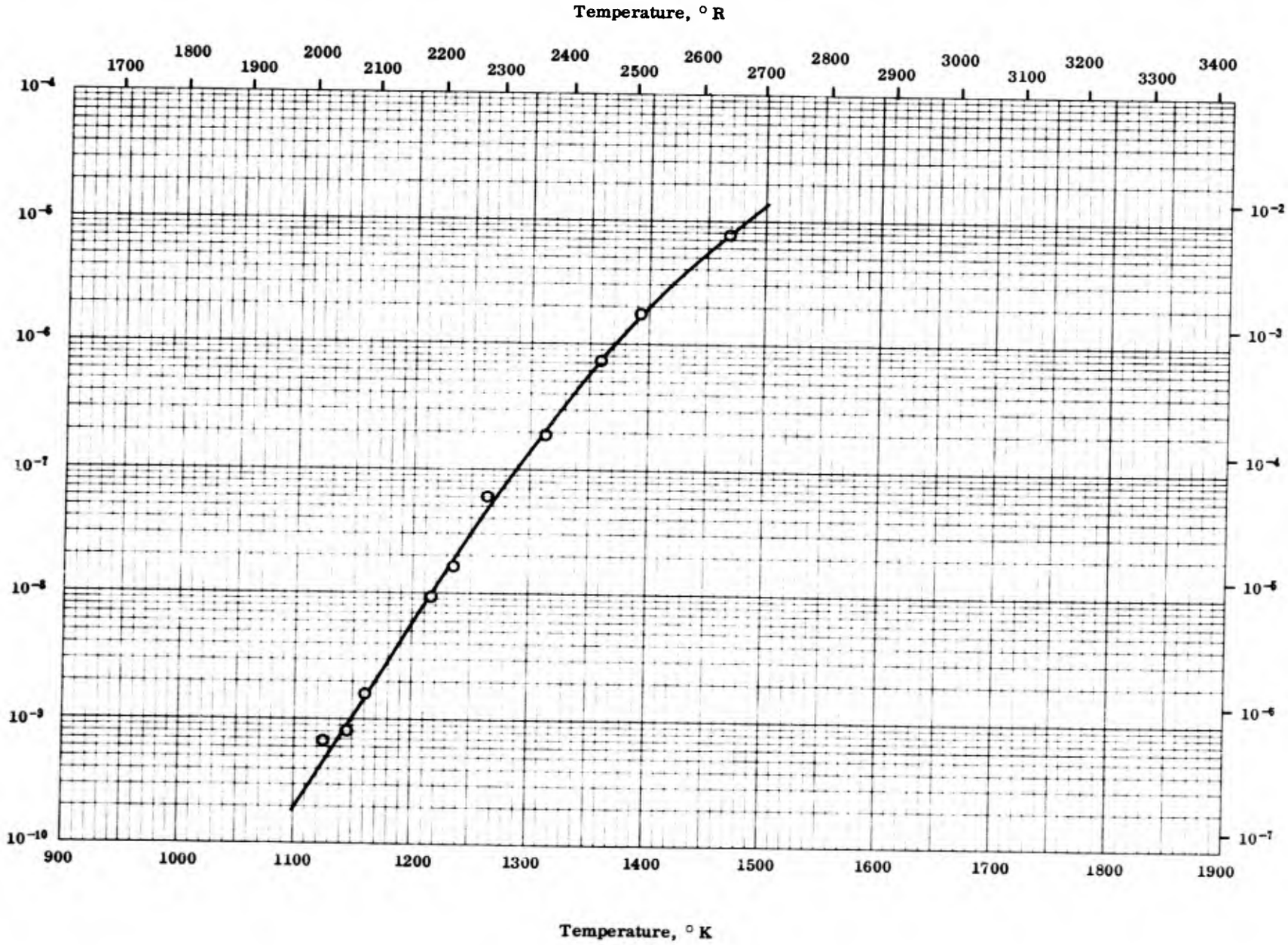
REPORTED VALUES

		cal g^{-1}	Btu lb^{-1}
Heat of Vaporization:	□	$269_{2690\,K}$	$362_{4842\,R}$
Heat of Sublimation:		cal g^{-1}	Btu lb^{-1}
	○	$319_{1273\,K}$	574_{2291}
	△	$377.9_{0K} \pm 0.490$	$680.2_{0R} \pm 0.882$

PROPERTIES OF AMERICIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-2	1273		99.8 Am F_3.	Precipitated from repurified Am by aqueous HF; washed with dil HF and H_2O then acetone; air-dried; Δh_s from vapor pressure data.
□	53-2	2690		99.8 Am F_3.	Author assumed Δh_f = 13 K cal mole^{-1}; Δh_v from extrolpolated vapor pressure data.
△	55-2	0		Am F_3 with 0.05 Fe and 0.01 Al.	

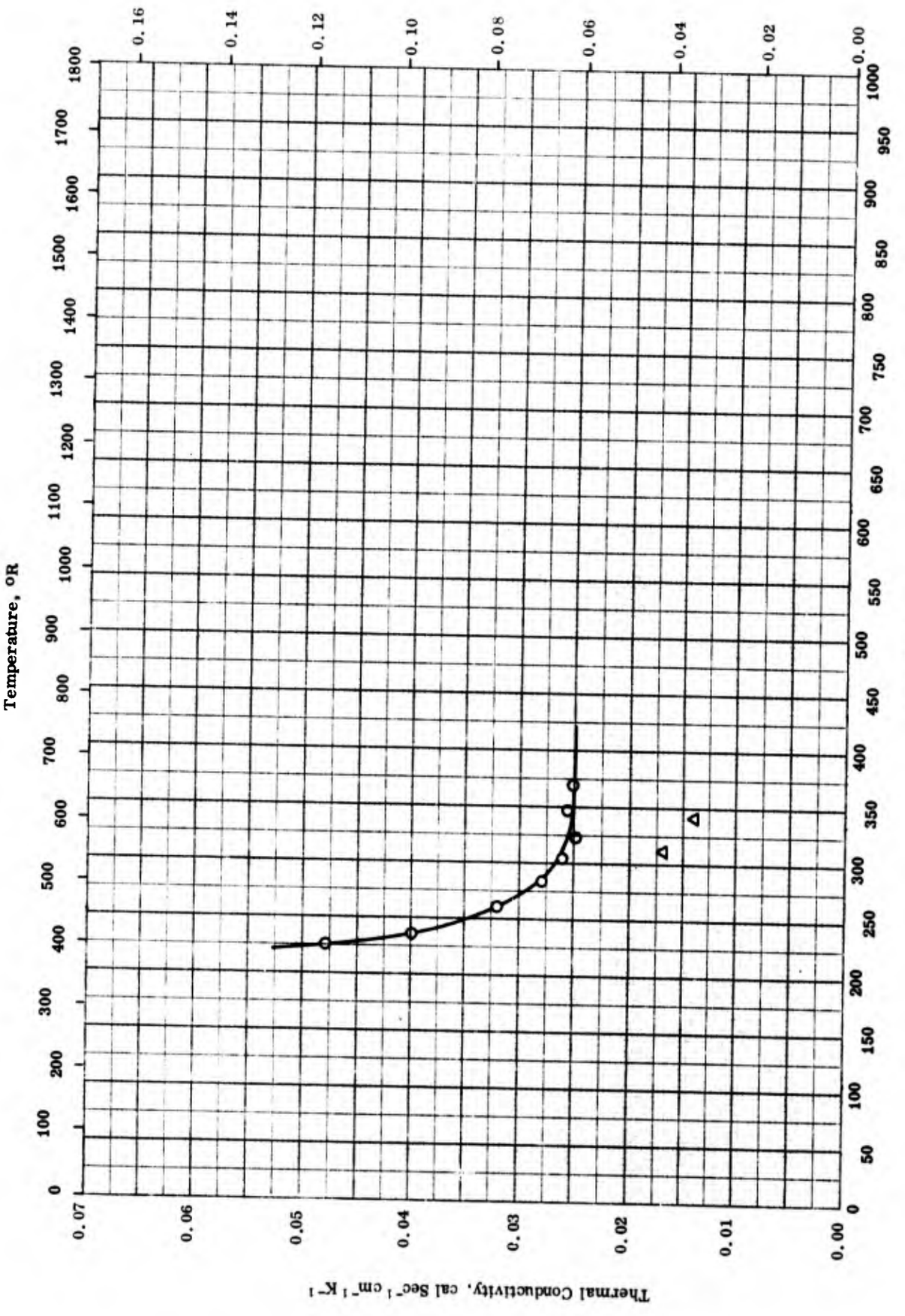


VAPOR PRESSURE -- AMERICIUM FLUORIDE

VAPOR PRESSURE -- AMERICIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-2 also 55-2	1126-1469	±6.0	AmF_3; 0.05 Fe and 0.01 Al.	Thermocouple calibrated against Mp of Au, Ag, Sn, Al.

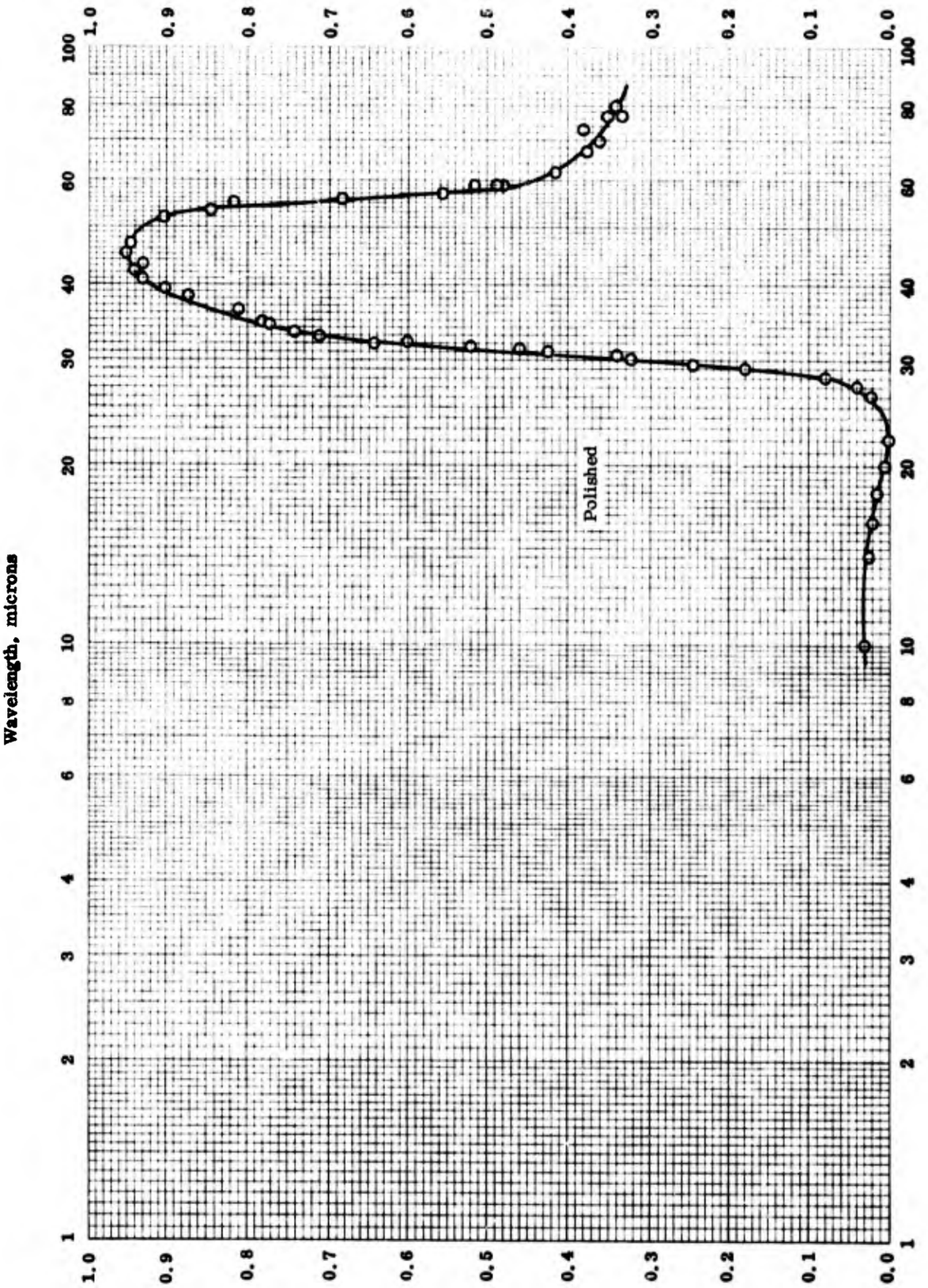


THERMAL CONDUCTIVITY -- BARIUM FLUORIDE

THERMAL CONDUCTIVITY -- BARIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	51-1	311-341		BaF_2; cubic isotropic crystal.	
○	60-1	225-370		BaF_2; crystalline sample provided by Optovac Co.	



NORMAL SPECTRAL REFLECTANCE -- BARIUM FLUORIDE

NORMAL SPECTRAL REFLECTANCE -- BARIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	62-28	298	10-80		BaF_2.	Surface polished by using standard metallographic polishing method, back surface roughened; normal incidence.

PROPERTIES OF BERYLLIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	2.01	125.4
Melting Point	1076	1937
Heat of Fusion	230	414
Heat of Vaporization. . .	$2033_{1076\,K}$	$3660_{1937\,K}$
Heat of Sublimation . . .	$2263_{1076\,K}$	4074_{1937_K}

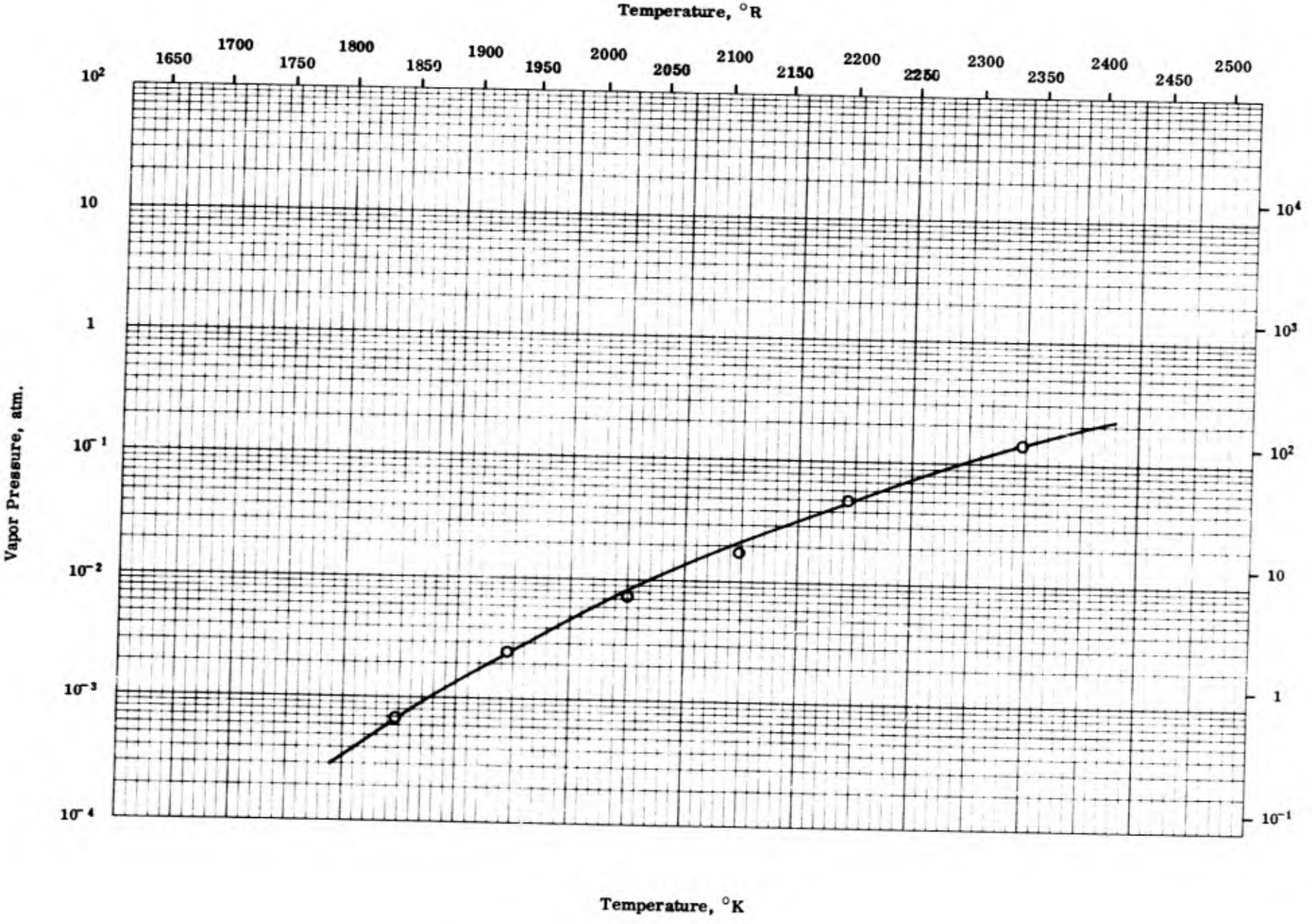
REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-1}$
	□	2.01	125.4
Melting Point		K	R
	○	1076	1937
Heat of Fusion		$cal\ g^{-1}$	$Btu\ lb^{-1}$
	▽	$230_{1076\,K}$	$414_{1937\,R}$
Heat of Vaporization		$cal\ g^{-1}$	$Btu\ lb^{-1}$
	◇	$2033_{1076\,K}$	$3660_{1937\,R}$
	△	1066	1918
Heat of Sublimation		$cal\ g^{-1}$	$Btu\ lb^{-1}$
	◁	$2263_{1076\,K}$	$4074_{1937\,R}$

PROPERTIES OF BERYLLIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-3	1076		BeF_2.	
◇	53-3	1011-1076		BeF_2.	Δh_v from vapor pressure measurement.
◁	53-3	1075-1161		BeF_2.	Δh_s from same as above.
▽	53-3	1076		BeF_2.	$\Delta h_f = \Delta h_s - \Delta h_v$.
□	61-21	288		BeF_2.	
△	61-21	---		BeF_2.	



VAPOR PRESSURE -- BERYLLIUM FLUORIDE

VAPOR PRESSURE -- BERYLLIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range, °K	Rept. Error %	Sample Specifications	Remarks
O	53-3 also 57-4	1023-1298		BeF_2.	Corrected for diffusion.

PROPERTIES OF CALCIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	3.180*	198.4*
Melting Point.	1775	3195

*Handbook of Chemistry and Physics (Ref. 64-18)

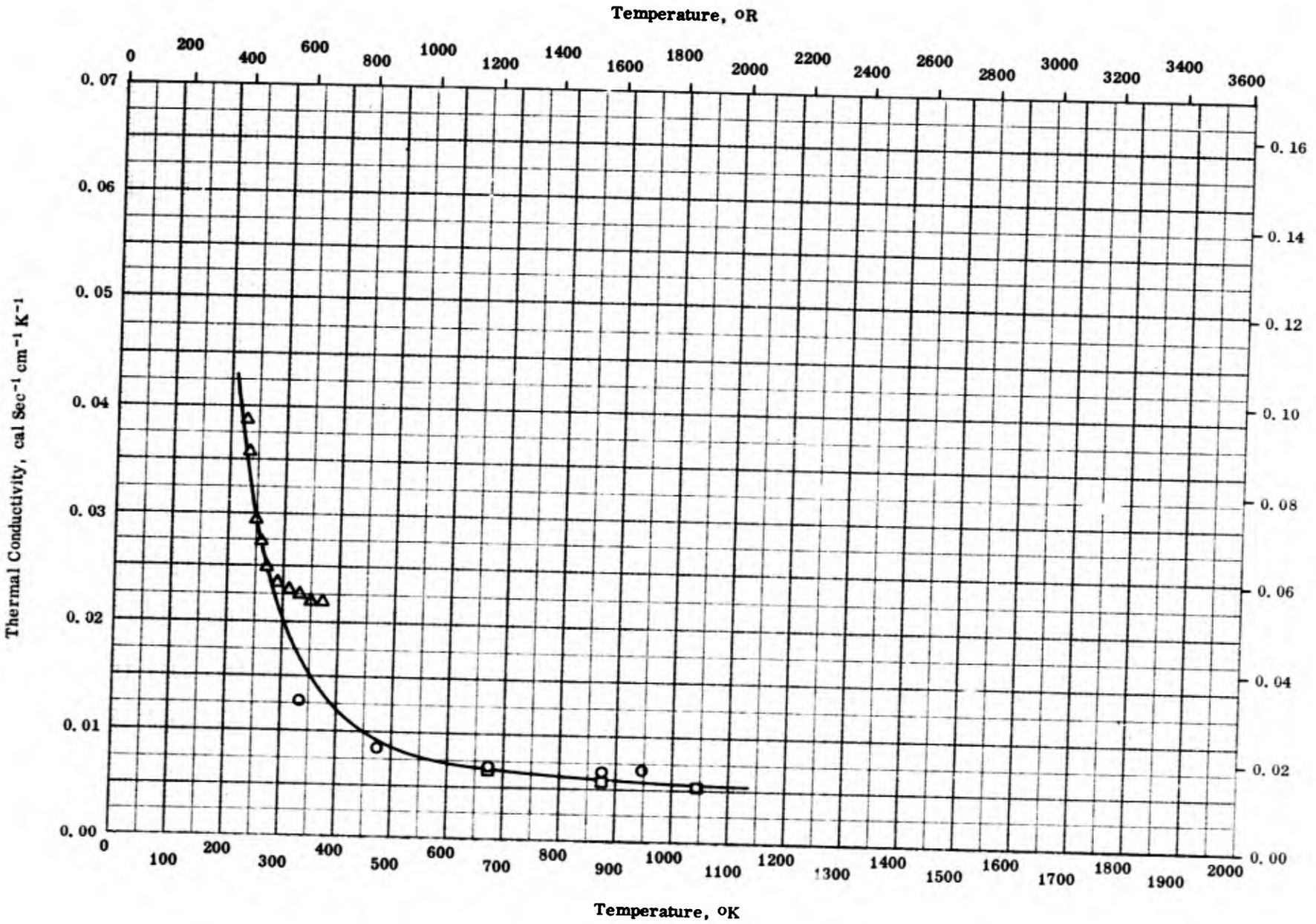
REPORTED VALUES

Melting Point	K	R
O	1775 ±5	3195 ± 9

PROPERTIES OF CALCIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-45	1770-1780		99.8 pure.	Measured in argon.

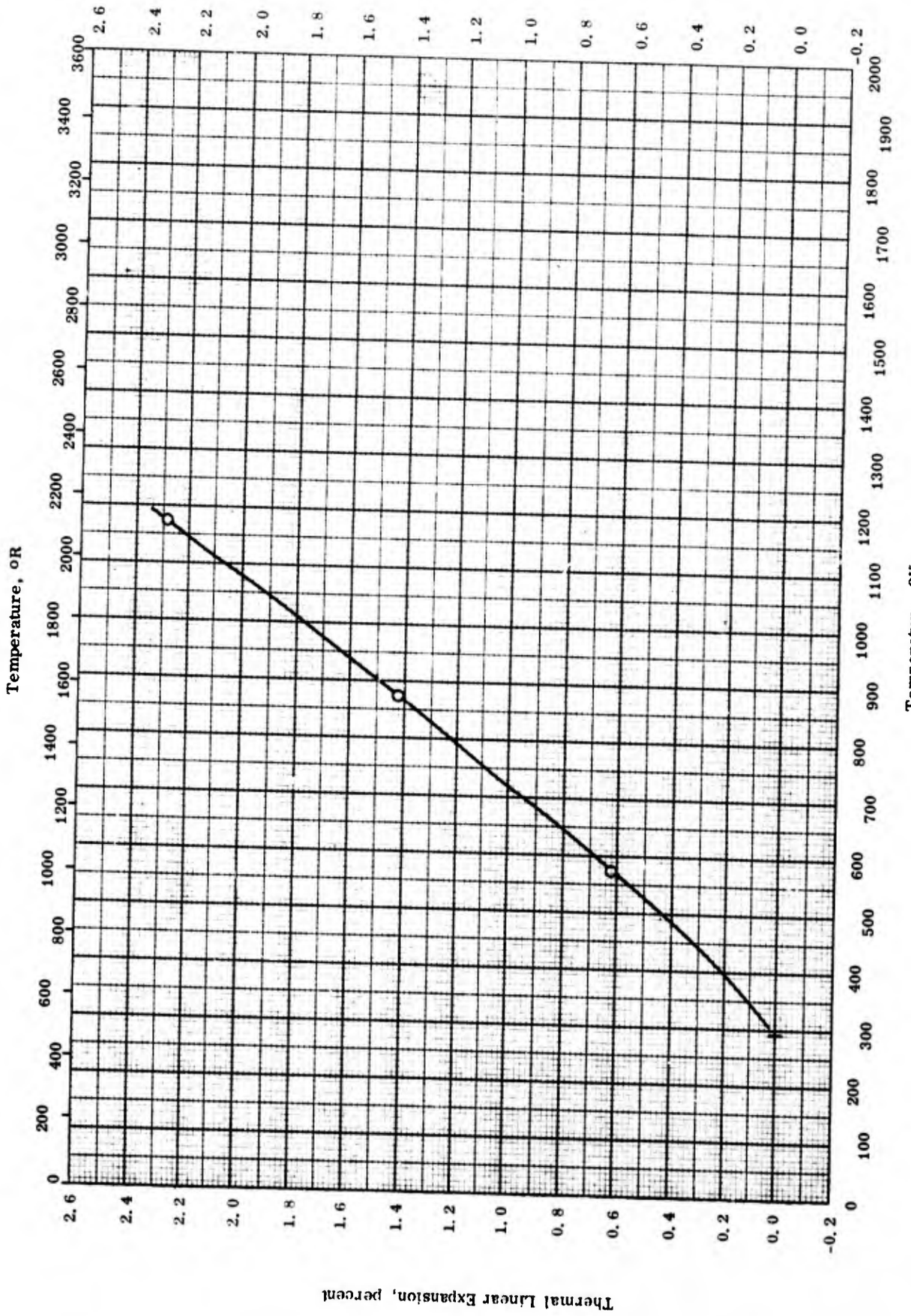


THERMAL CONDUCTIVITY -- CALCIUM FLUORIDE

THERMAL CONDUCTIVITY -- CALCIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-10	323-1073		Single crystal CaF_2.	
□	57-10	323-1073		Polycrystalline CaF_2; 8.17% (based on density) porosity and 10.9% (based on microstructure) porosity.	Data corrected to zero porosity.
△	60-1	229-369		Crystalline sample provided by Optovac Co.	

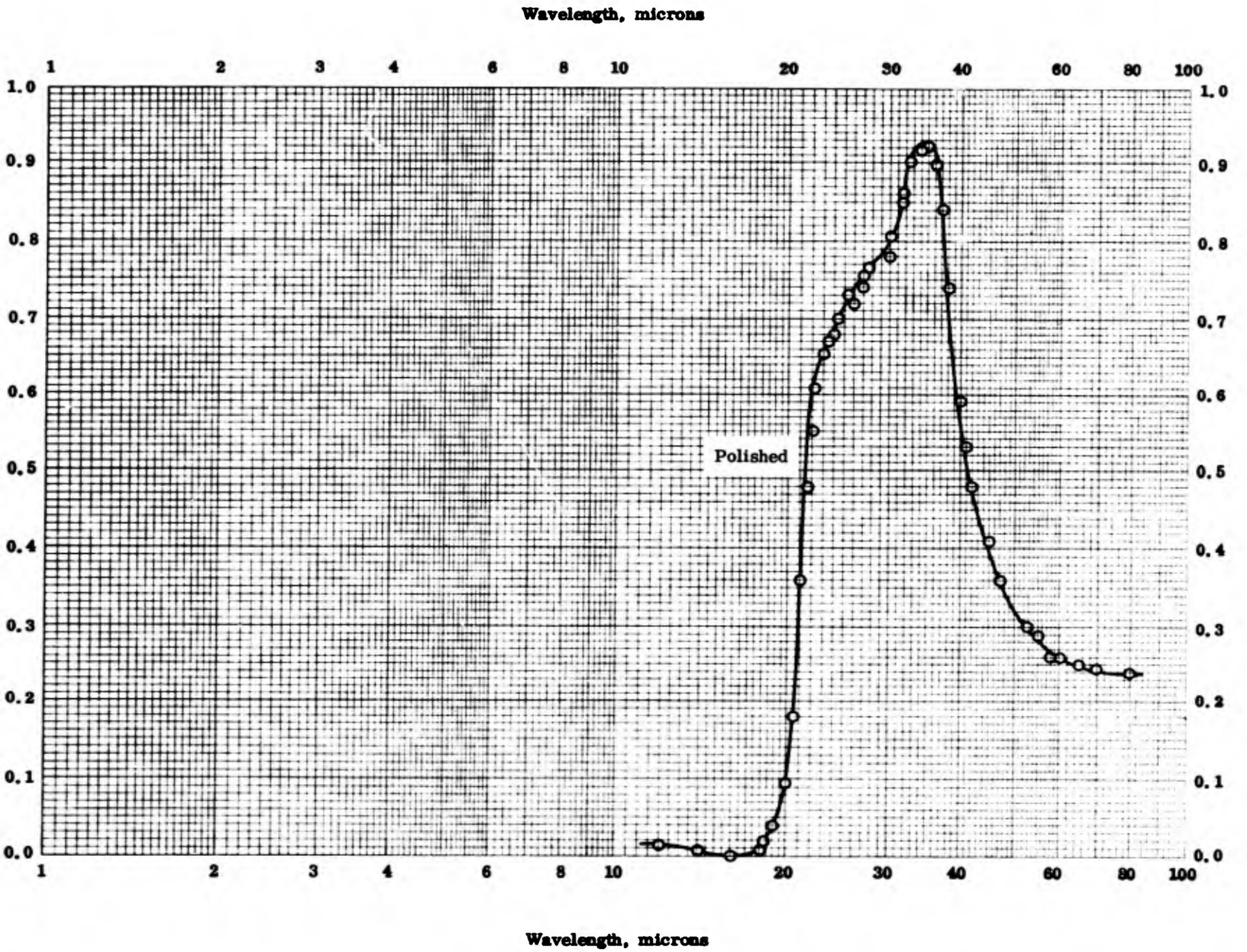


THERMAL LINEAR EXPANSION -- CALCIUM FLUORIDE

THERMAL LINEAR EXPANSION -- CALCIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-7	573-1173		CaF_2.	Sintered, high density.



NORMAL SPECTRAL REFLECTANCE -- CALCIUM FLUORIDE

NORMAL SPECTRAL REFLECTANCE -- CALCIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	62-28	298	12-80		CaF_2.	Surface polished by using standard metallographic polishing method, back surface roughened; normal incidence.

PROPERTIES OF CERIUM TRIFLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.16	384.4
Melting Point	1710	3078

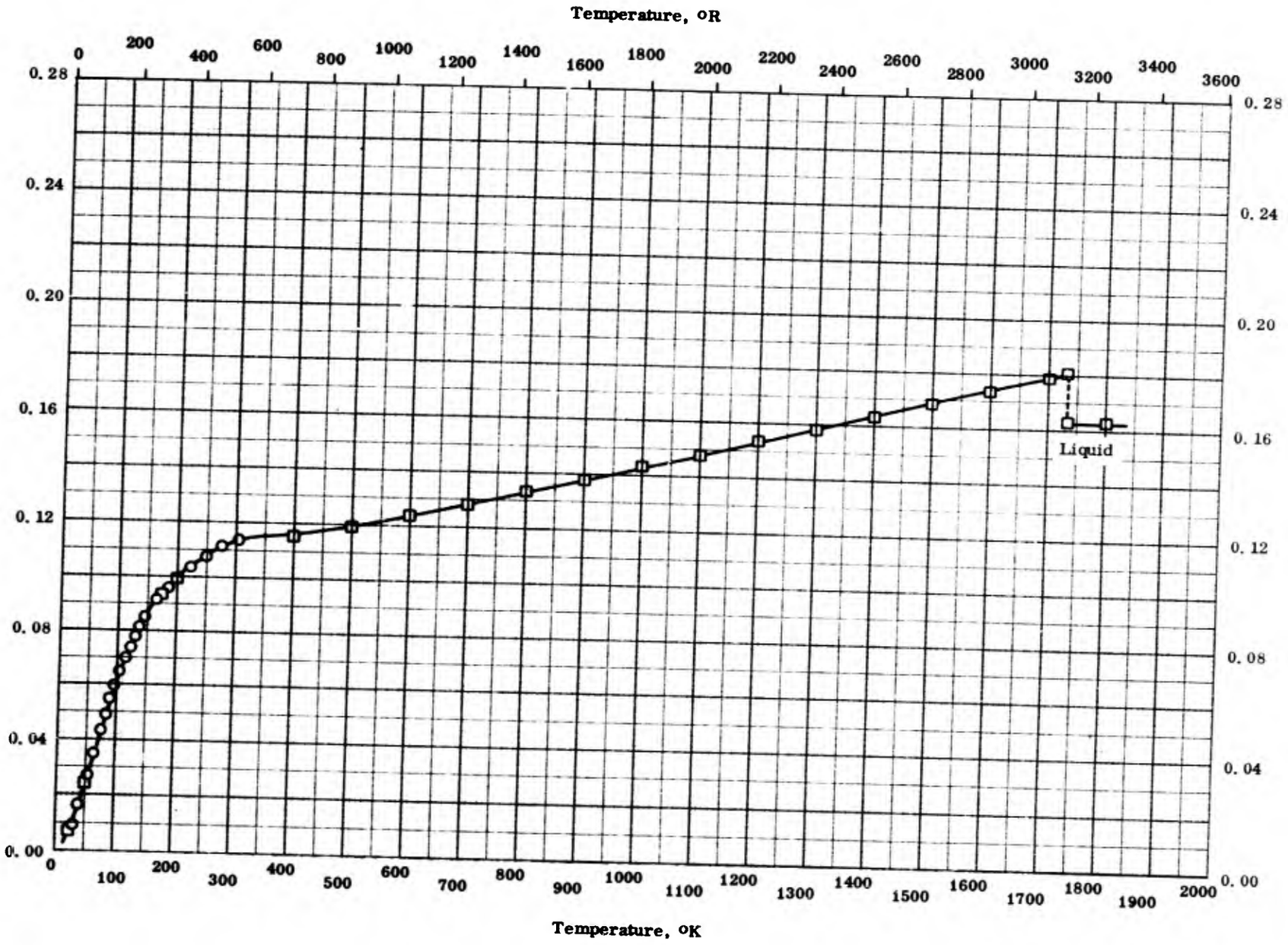
REPORTED VALUES

Melting Point	K	R
	○ 1710 ± 5	3078 ± 9

PROPERTIES OF CERIUM TRIFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-45	1705-1715		99.8+ pure.	Measured in argon.

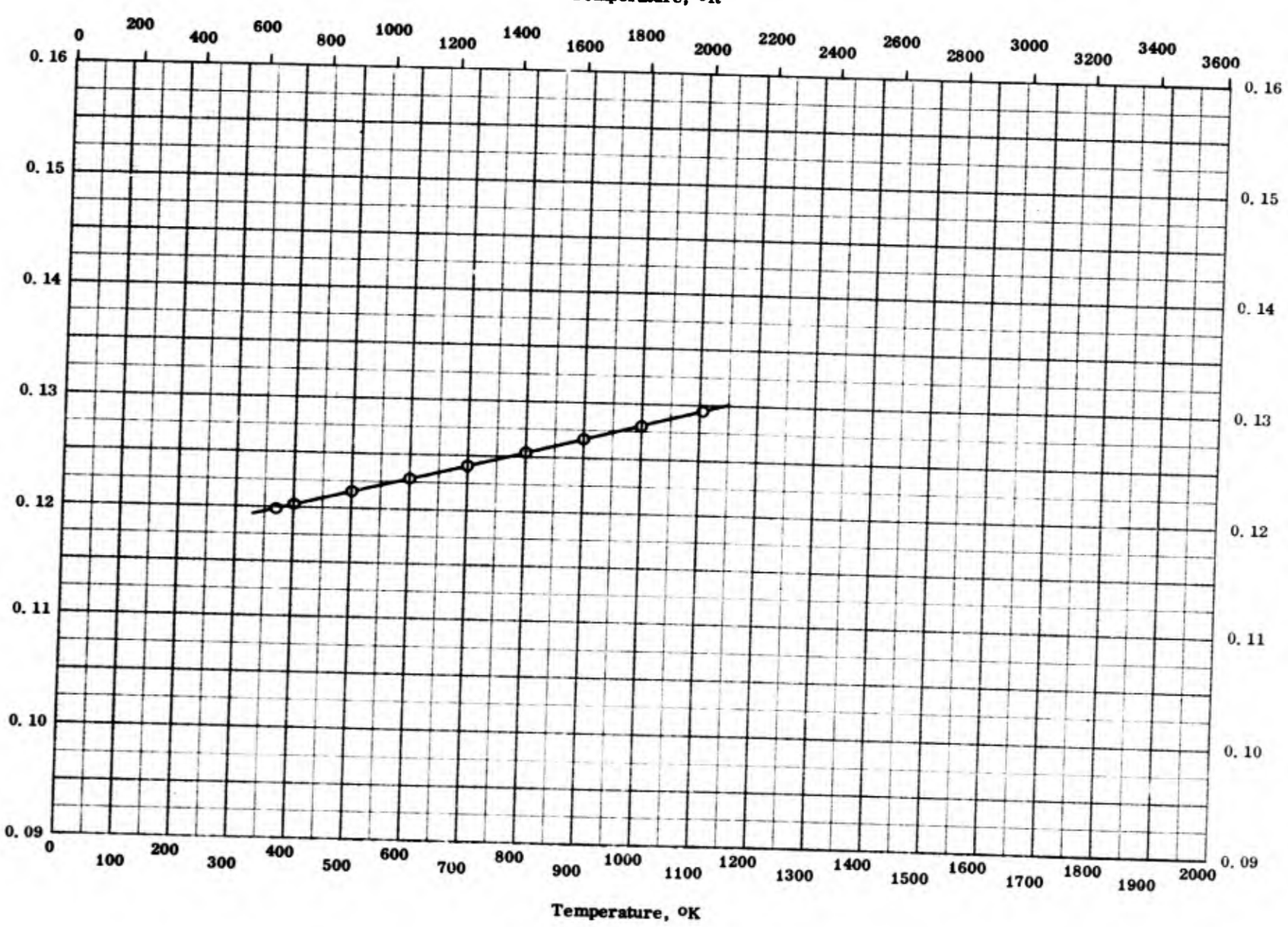


SPECIFIC HEAT -- CERIUM TRIFLUORIDE

SPECIFIC HEAT -- CERIUM TRIFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	61-15	5-300	0.1-2	CeF_3; 71.12 Ce, and 28.88 F.	Prepared by addition of HF to ceric ammonium nitrite solution; the precipitate was dried at 110 C, ignited and finally heated at 500 C in HF gas.
□	59-15	50-1800	0.1-0.5	CeF_3; 71.14 Ce, 28.87 F, 0.1 >Na, 0.01 > Ca, 0.01 >K, 0.01> Mg.	Heated 2-5 hrs at 700 C.



SPECIFIC HEAT -- HAFNIUM TETRAFLUORIDE

SPECIFIC HEAT -- HAFNIUM TETRAFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	61-17	370-1105		99.00 Hf F_4, 1.0 Zr, and traces Al, Fe, Mg and V.	

PROPERTIES OF LITHIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.64	165
Melting Point	1133	2039
Heat of Fusion	250	449
Heat of Vaporization . . .	1850	3330
Heat of Sublimation . . .	2602	4684

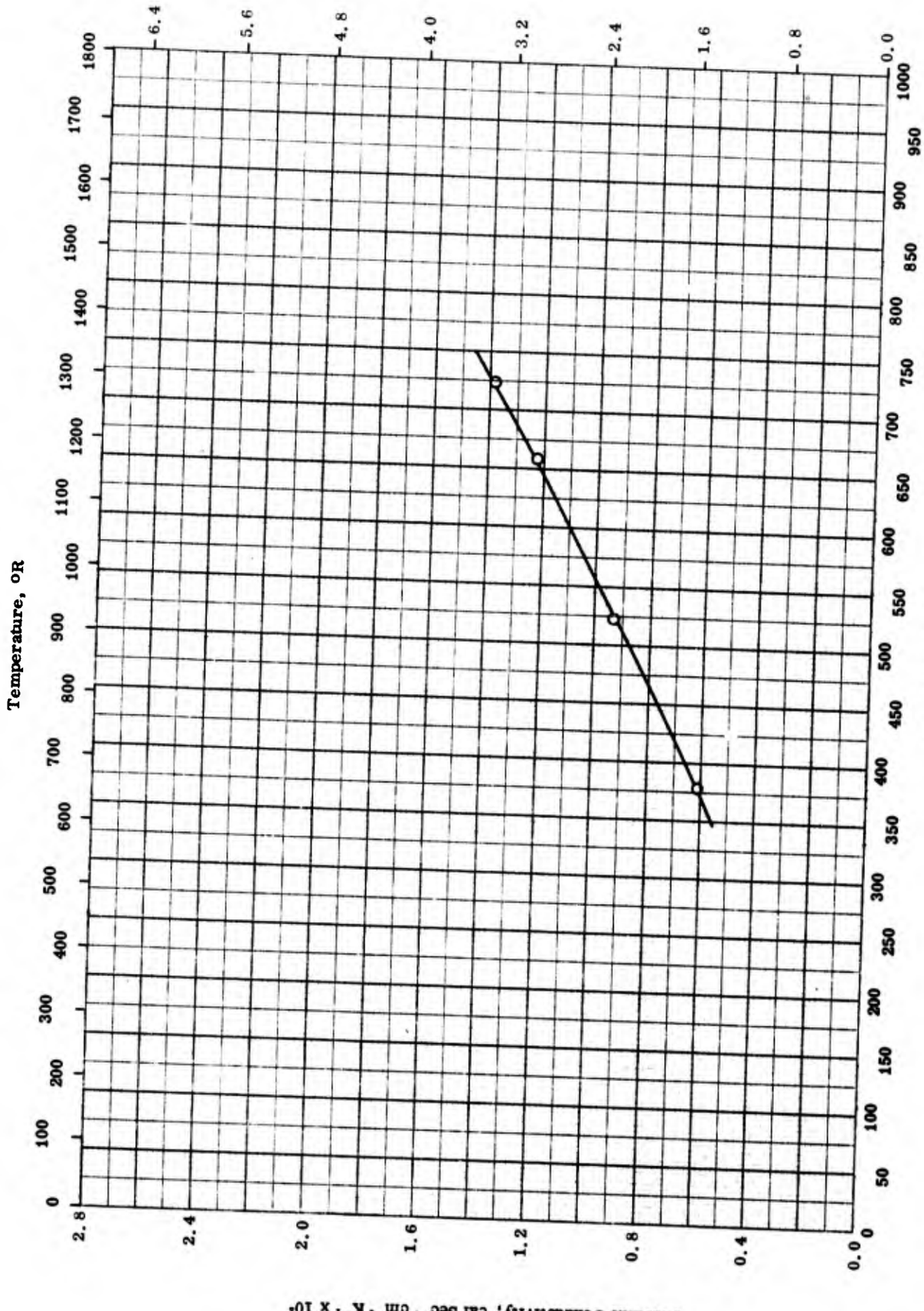
REPORTED VALUES

Density	$g\ cm^{-3}$	$lb\ ft^{-3}$
○	2.639	164.7
Melting Point	K	R
●	1119 ± 5	2014 ± 9
■	1133 ± 5	2039 ± 9
▲	1121	2018
Heat of Fusion	$cal\ g^{-1}$	$Btu\ lb^{-1}$
△	249.5	449.1
Heat of Vaporization	$cal\ g^{-1}$	$Btu\ lb^{-1}$
◁	1850	3330
Heat of Sublimation	$cal\ g^{-1}$	$Btu\ lb^{-1}$
◇	2602	4684
▽	2563	4613
▷	1380	2484

PROPERTIES OF LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	298		Li F.	
△	61-21	298		Li F.	
◁	61-21	298		Li F.	
◇	63-5	---		Li F.	
▽	64-2	---		Li F; reagent grade.	
▷	64-2	---		Li_2F_2; dimer.	
●	62-45	1114-1124		99.8+ Li F.	Measured in Argon.
■	60-27	1128-1138		Li F.	
▲	59-18	1121		Li F.	

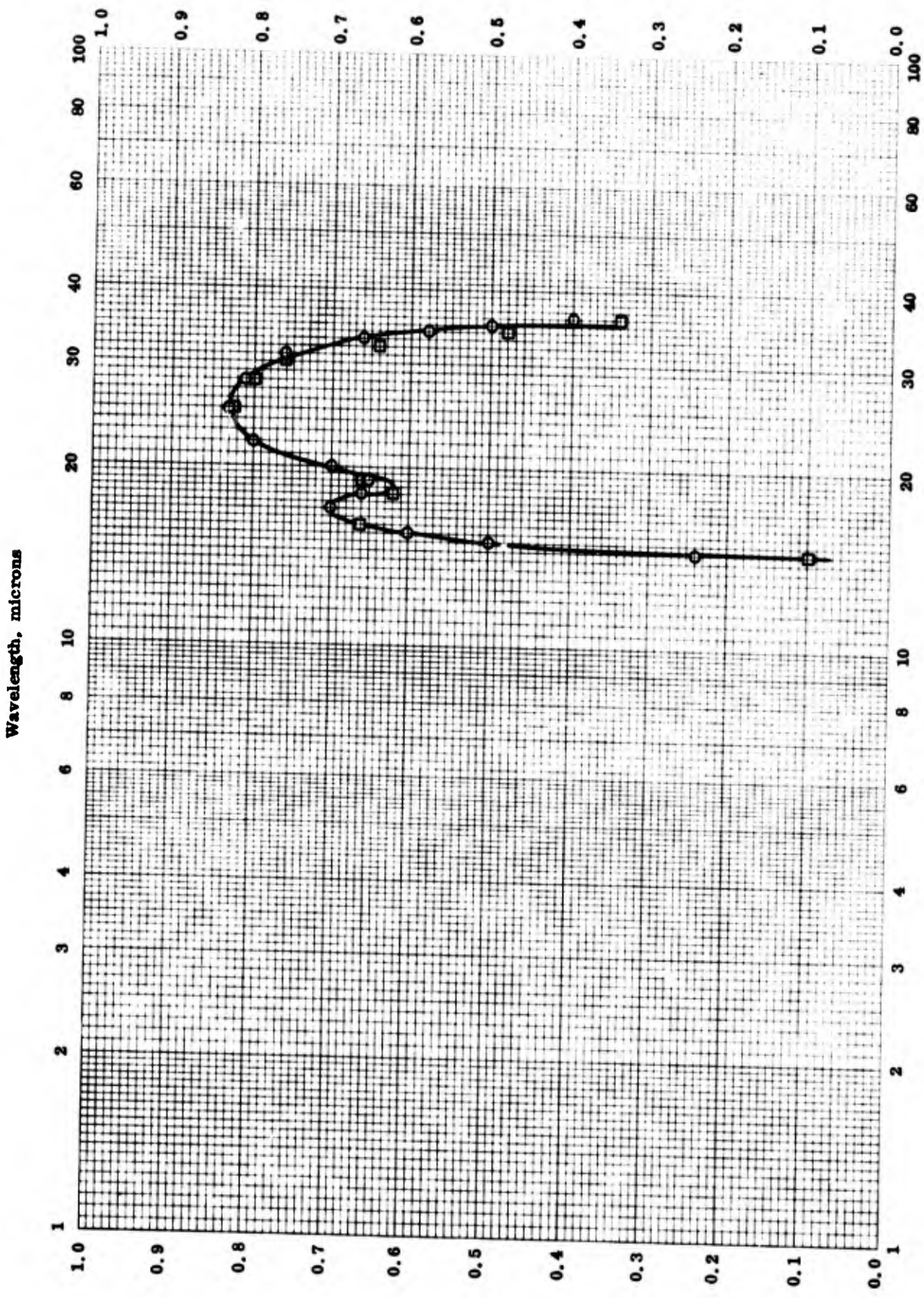


THERMAL CONDUCTIVITY -- LITHIUM FLUORIDE

THERMAL CONDUCTIVITY -- LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	43-1	378-722		LiF.	Synthetic material.



NORMAL SPECTRAL REFLECTANCE -- LITHIUM FLUORIDE

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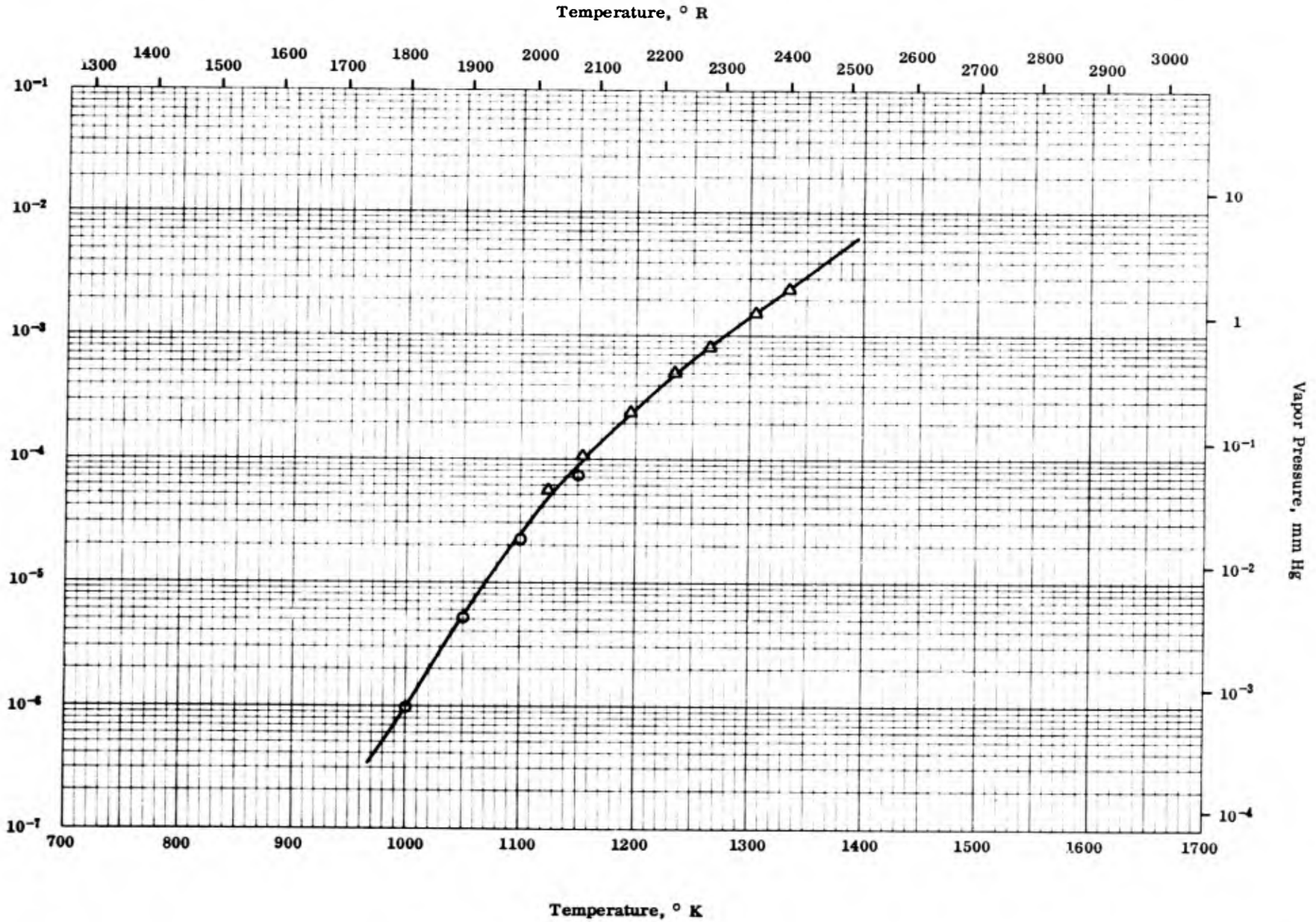
NORMAL SPECTRAL REFLECTANCE -- LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	60-18	300	14.5-36		Li^7F; film 10μ thickness.	Deposited on substrate of natural lithium fluoride crystal by vacuum evaporation; data taken from smooth curve.
□	60-18	300	14.5-36		Li^6F; same as above.	Same as above.

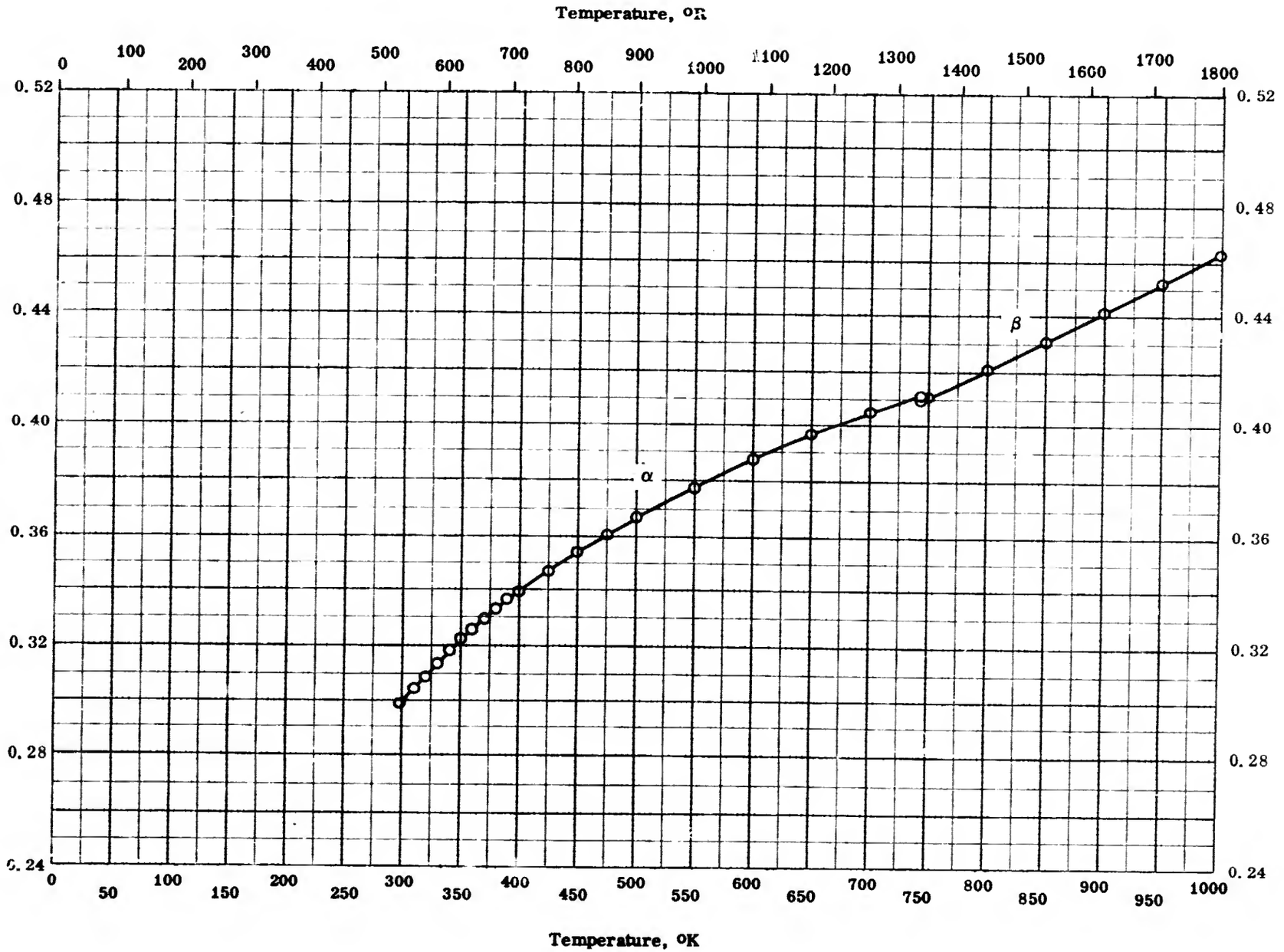


VAPOR PRESSURE -- LITHIUM FLUORIDE

VAPOR PRESSURE -- LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
Δ	57-3	1124-1333		Pure salt.	
O	64-2	1000-1150		Reagent grade LiF; dimer to monomer ratio 1.5.	From the equations: For solid (997-1119 K) $\log P\ (atm) = (8.857 \pm 0.140) - (14865 \pm 149)\ T^{-1}$ For liquid (1125-1159 K) $\log P\ (atm) = (6.792 \pm 0.196) - (12584 \pm 224)\ T^{-1}$

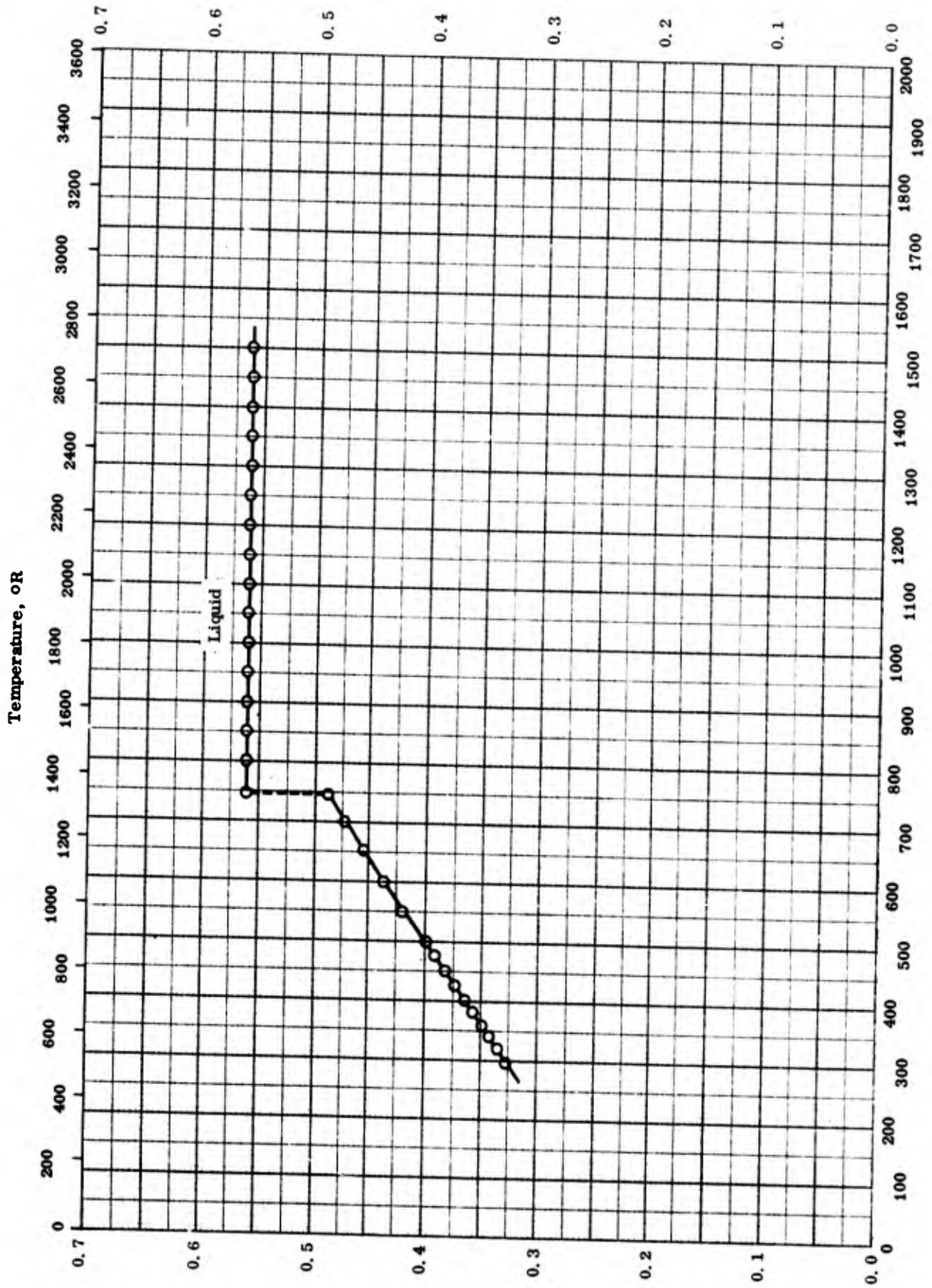


SPECIFIC HEAT -- LITHIUM ALUMINUM FLUORIDE

SPECIFIC HEAT -- LITHIUM ALUMINUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-6	298-1000		$Li_3 Al F_6$; 70.43 F, 16.74 Al and 12.92 Li.	



SPECIFIC HEAT -- LITHIUM BERYLLIUM FLUORIDE

SPECIFIC HEAT -- LITHIUM BERYLLIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-6	298-1500		Li_2BeF_4; 76.86 F, 14.03 Li 9.11 Be, 0.001-0.01, Al, Ag, Cu, Fe, K, Mn, Na, Si, Ti and Zr, 0.0001-0.001 Ba, Ni and Pb.	

PROPERTIES OF MAGNESIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Melting Point	1536	2765

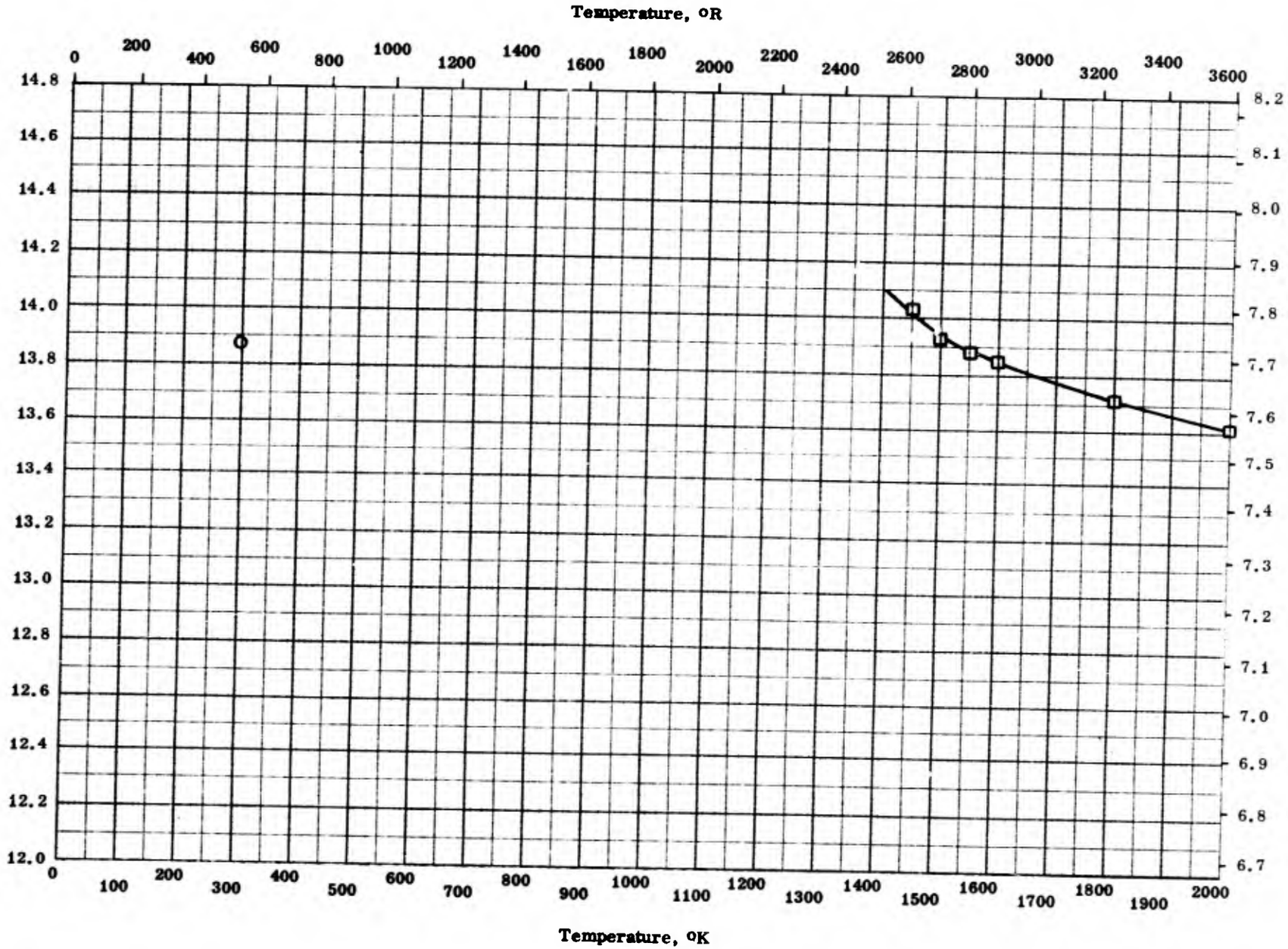
REPORTED VALUES

		K	R
Melting Point			
	O	1536	2765
Heat of Sublimation		See figure	

PROPERTIES OF MAGNESIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-2	1536		MgF_2 by reagent grade MgO powder and HF.	Treated MgO powder with excess aqueous HF; washed and dried at 800 K in a stream of anhydraous HF.

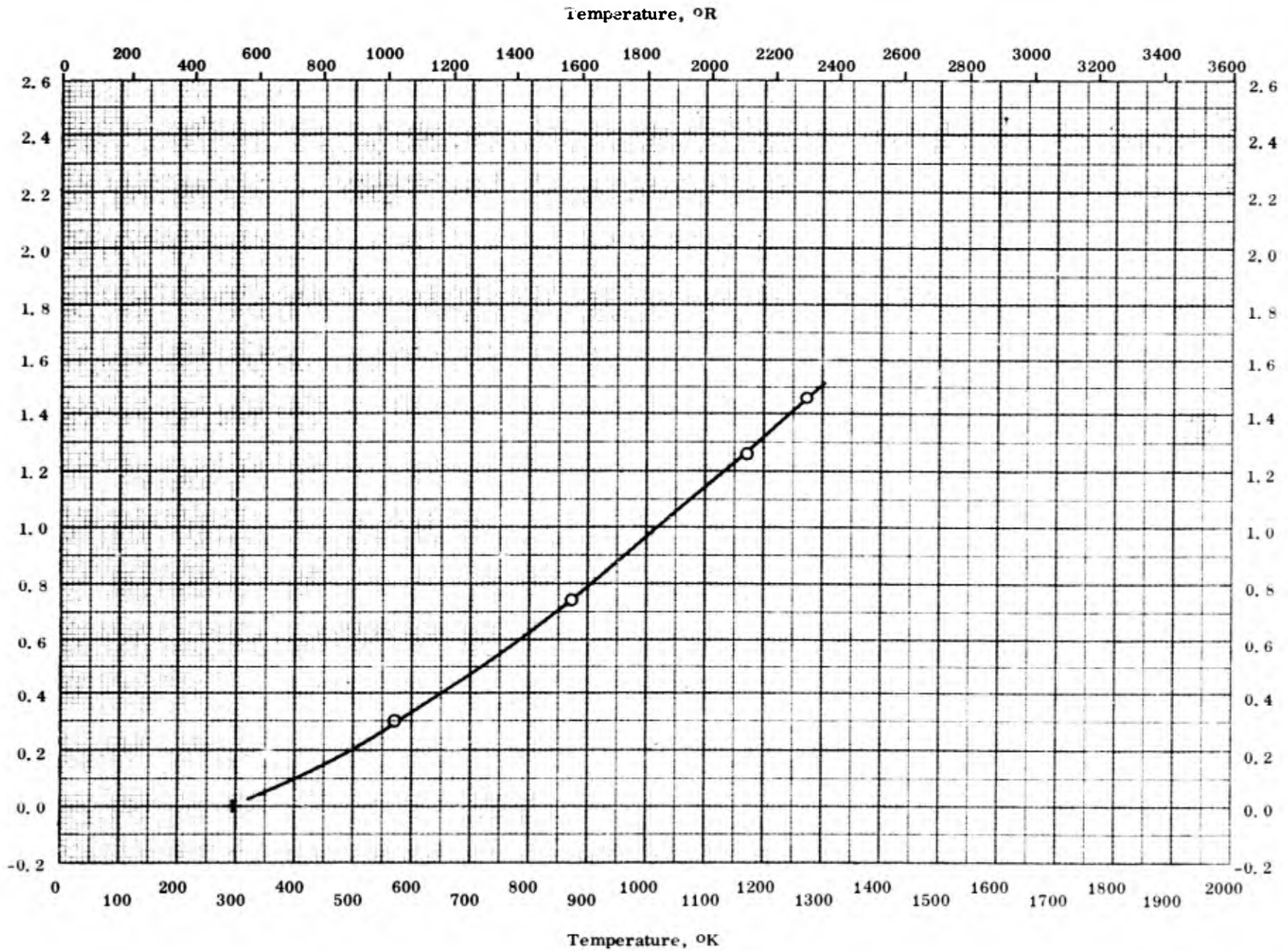


HEAT OF SUBLIMATION -- MAGNESIUM FLUORIDE

HEAT OF SUBLIMATION -- MAGNESIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-5	298		MgF_2.	
□	64-2	1450-2000		MgF_2; prepared from reagent grade MgO powder and HF.	Treated reagent grade MgO powder with excess aqueous HF, washed, and dried at 800 C in a stream of anhydrous HF.

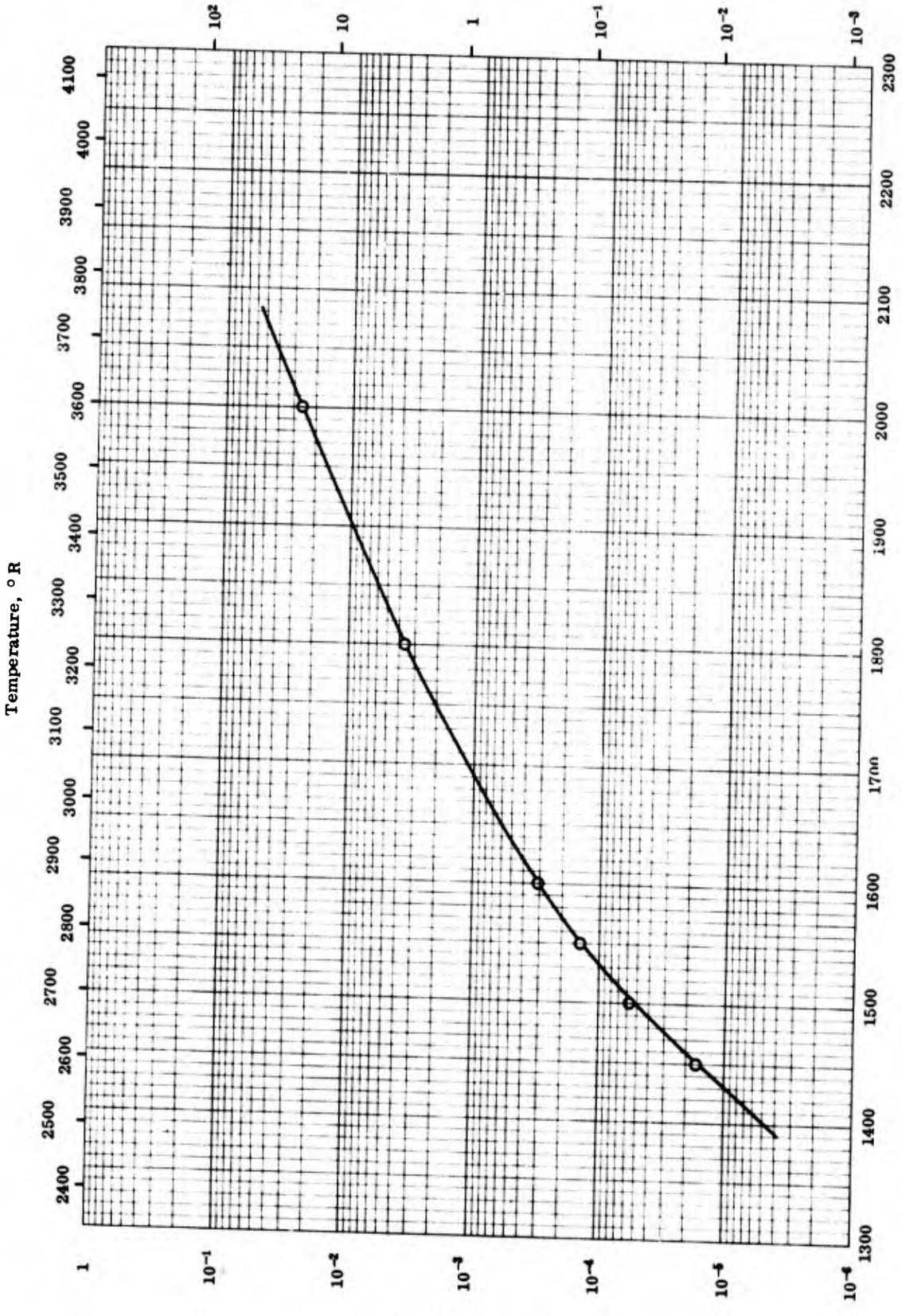


THERMAL LINEAR EXPANSION -- MAGNESIUM FLUORIDE

THERMAL LINEAR EXPANSION -- MAGNESIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-7	573-1273		MgF_2; fine grain.	



VAPOR PRESSURE -- MAGNESIUM FLUORIDE

VAPOR PRESSURE -- MAGNESIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-2	1450-2000	10	MgF_2.	Treated reagent grade MgO powder with excess aqueous Hf, washed, dried at 800 C in a stream of anhydrous Hf.

PROPERTIES OF PLUTONIUM TRIFLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	9.32*	582*
Melting Point	1680	3024
Heat of Fusion	43.5	78.3
Heat of Vaporization . . .	$223_{2460\,K(B.P.)}$	$401_{4428\,R\,(B.P.)}$
Heat of Sublimation . . .	386_{0K}	695_{0K}

*Handbook of Chemistry and Physics (Ref. 64-18)

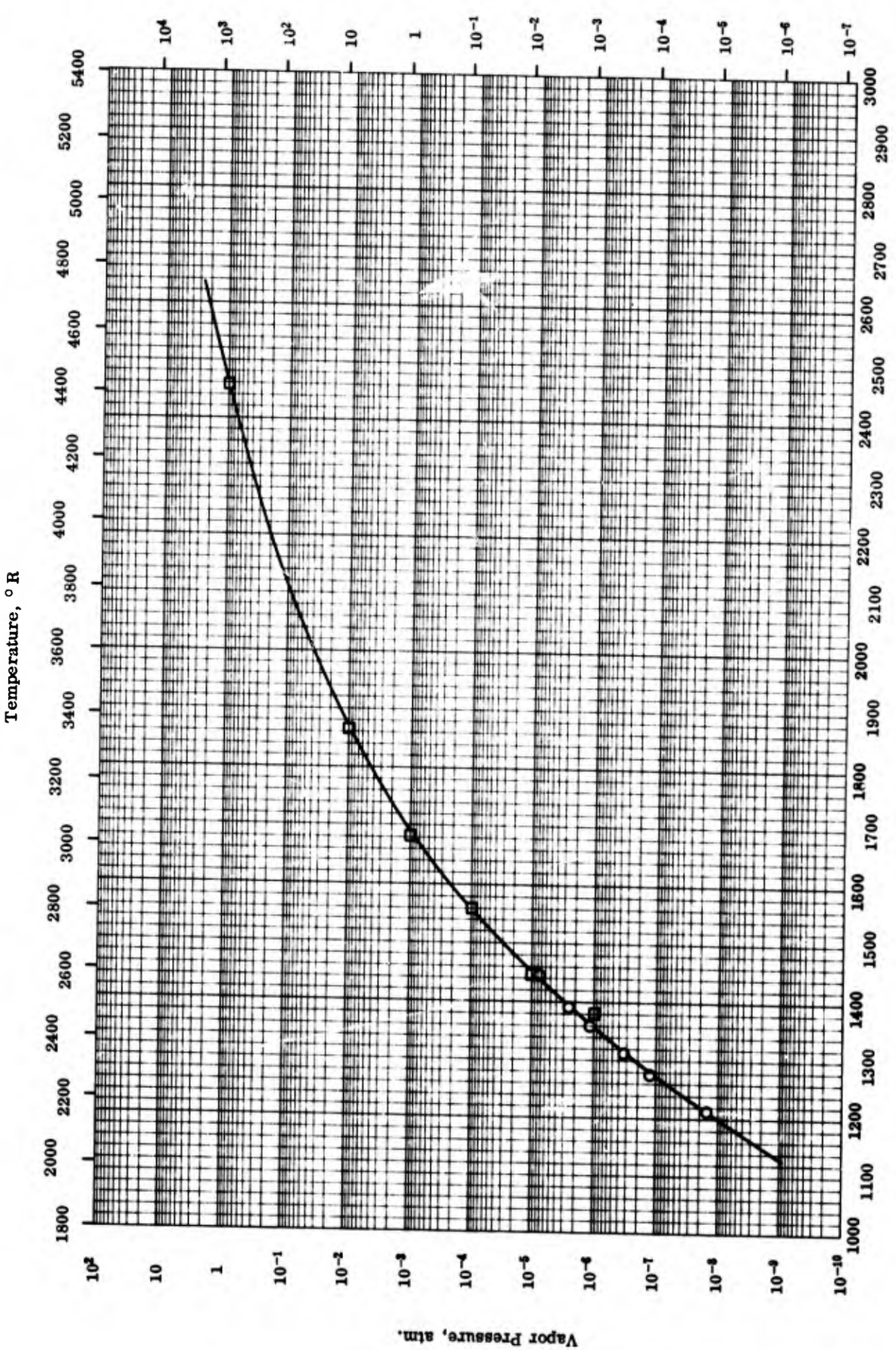
REPORTED VALUES

		K	R
Melting Point:			
	○	1680± 20	3024 ± 36
Heat of Fusion:		cal g^{-1}	Btu lb^{-1}
	▽	$43.5_{1680\pm 20\,K}$	$78.3_{3024\pm 36\,R}$
Heat of Vaporization:		cal g^{-1}	Btu lb^{-1}
	●	354.2_{0K}	637.5_{0R}
	■	$222.7_{2460K(B.P.)}$	$400.9_{4428\,R\,(B.P.)}$
	□	209_{2550K}	377_{4590R}
Heat of Sublimation:		cal g^{-1}	Btu lb^{-1}
	▲	386.3_{0K}	695.3_{0R}
	▼	$317_{1335\,K}$	$571_{2400\,R}$
	△	$382.236_{0K}\pm 0.530$	$688.024_{0R}\pm 0.954$

PROPERTIES OF PLUTONIUM TRIFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-1	1660-1700		PuF_3.	
▽	49-1	1660-1700		PuF_3.	
●	49-1	0		PuF_3.	
■	49-1	2460		PuF_3.	
▲	49-1	0		PuF_3.	
□	53-2	2550		99.9 PuF_3, 0.02 Al, 0.02, 0.02 Mg, and 0.01 La.	Precipitated with H_2 from purified Pu(IV) stock solution after reduction to Pu (III) with SO_2, washed, air-dried and vacuum-dried; and vacuum-dried; Δh_V from vapor pressure data.
▼	53-2	1335		Same as above.	Same as above; Δh_S from vapor pressure data.
△	55-2	0		Same as above.	Δh_S from vapor pressure data.

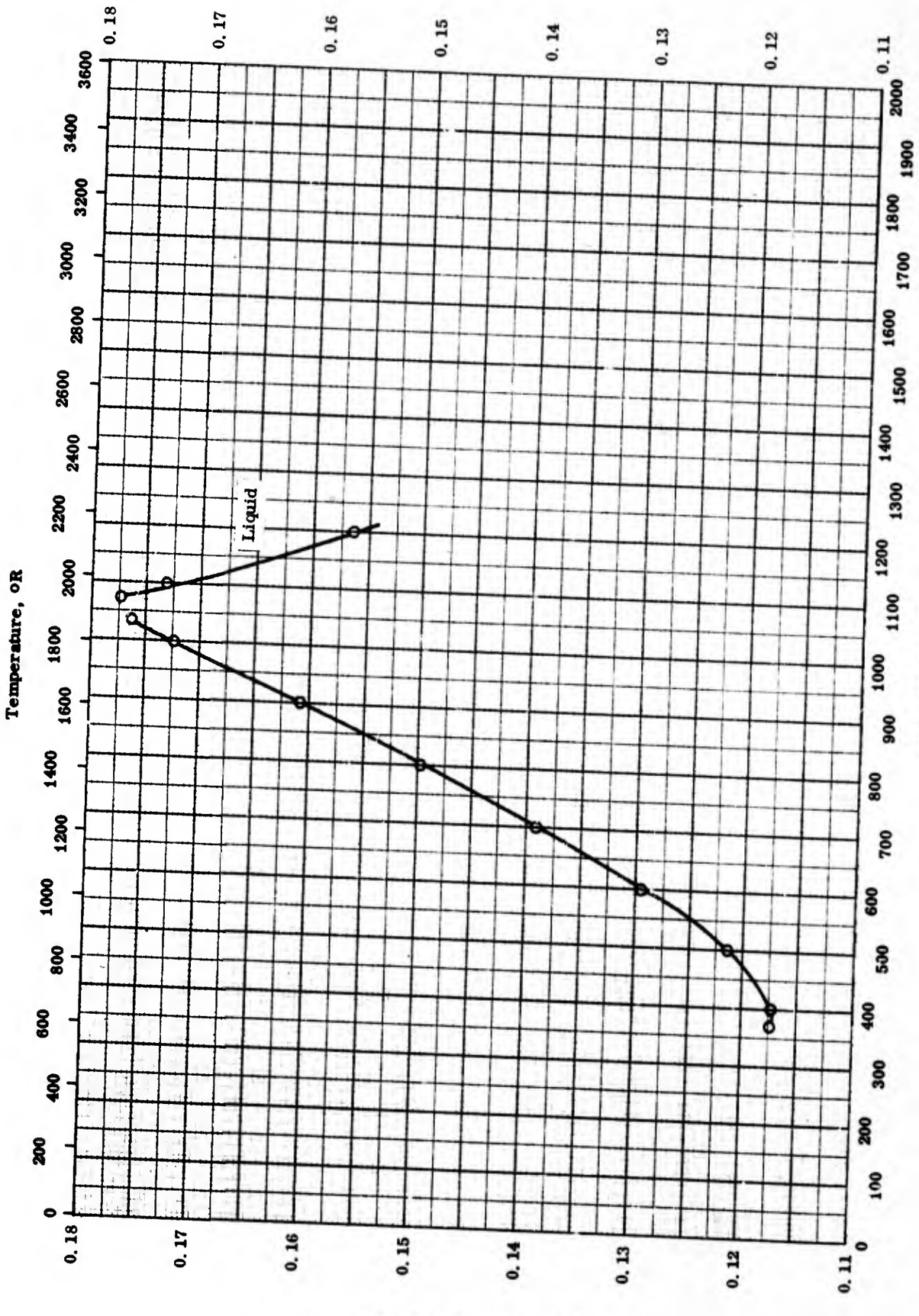


VAPOR PRESSURE -- PLUTONIUM TRIFLUORIDE

VAPOR PRESSURE -- PLUTONIUM TRIFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-2	1214-1444	±6	PuF_3; 0.02 ea Al, Mg, and 0.01 La.	Thermocouple calibrated against MP of Au, Ag, Sn, Al.
□	49-65	1380-2460		PuF_3.	

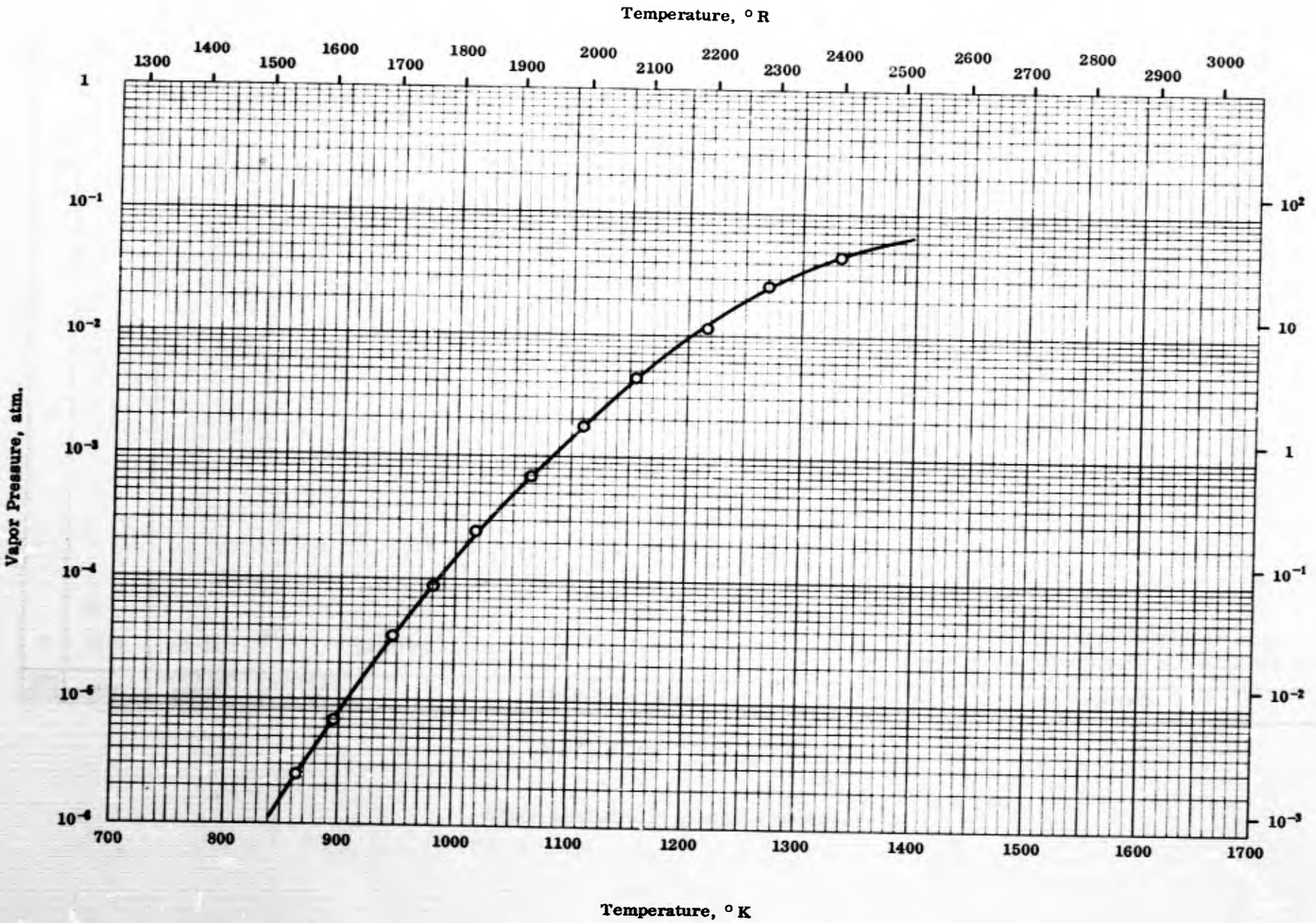


SPECIFIC HEAT -- RUBIDIUM FLUORIDE

SPECIFIC HEAT -- RUBIDIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	61-17	370-1200		99.8 Rb F.	



VAPOR PRESSURE -- RUBIDIUM FLUORIDE

VAPOR PRESSURE -- RUBIDIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-3	862-1332		Pure salt.	Least-square equation fitted to experimental data by authors with ± 8% deviation at the lowest temperatures.

PROPERTIES OF STRONTIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	4.29	268
Melting Point	1736	3125

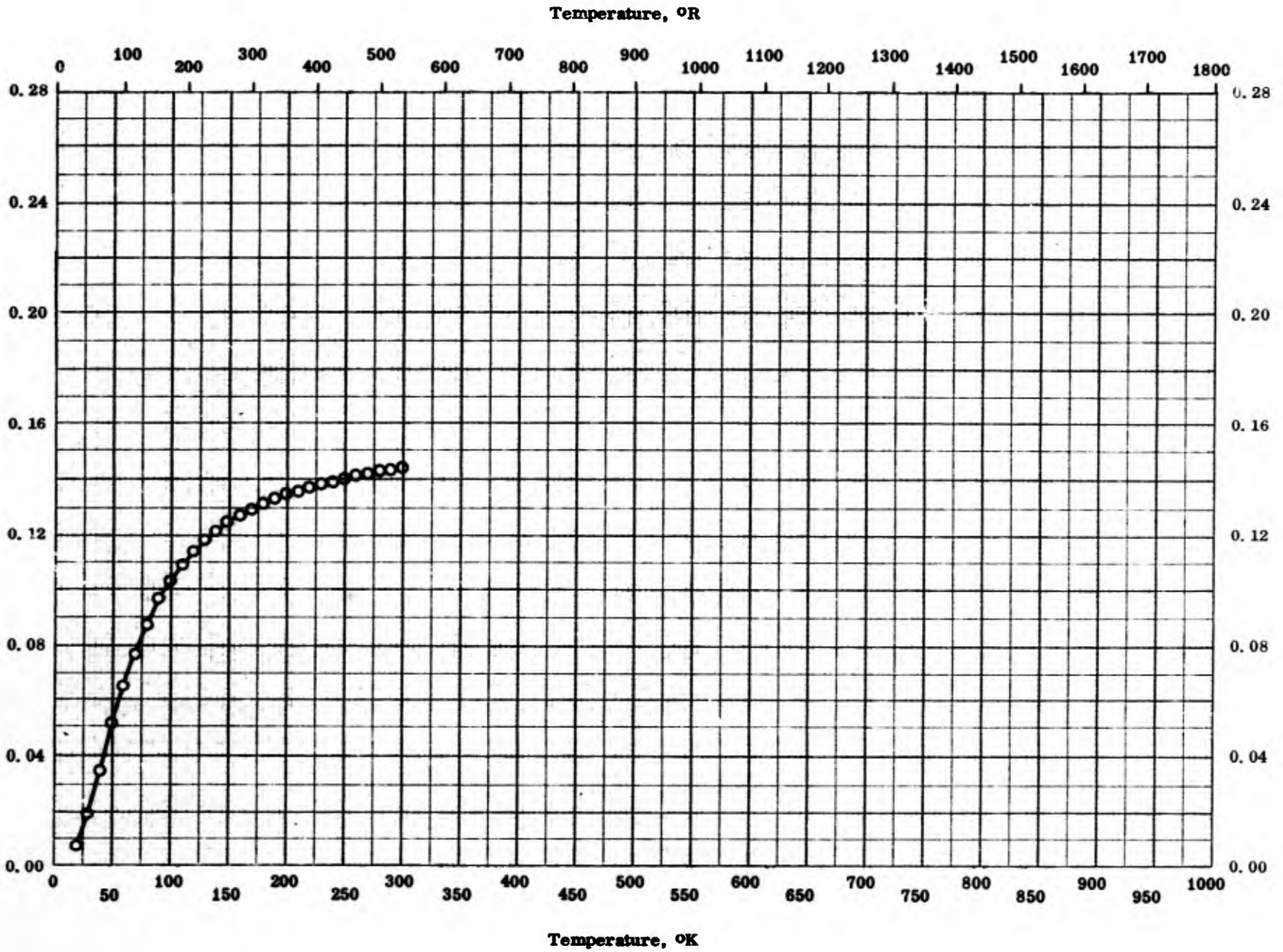
REPORTED VALUES

Density		$g\,cm^{-3}$	$lb\,ft^{-3}$
	○	4.29	268
Melting Point		K	R
	□	1736 ± 5	3125 ± 9

PROPERTIES OF STRONTIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	59-16	298		SrF_2.	
□	62-45	1731-1741		99.8+ SrF_2.	Measured in argon.

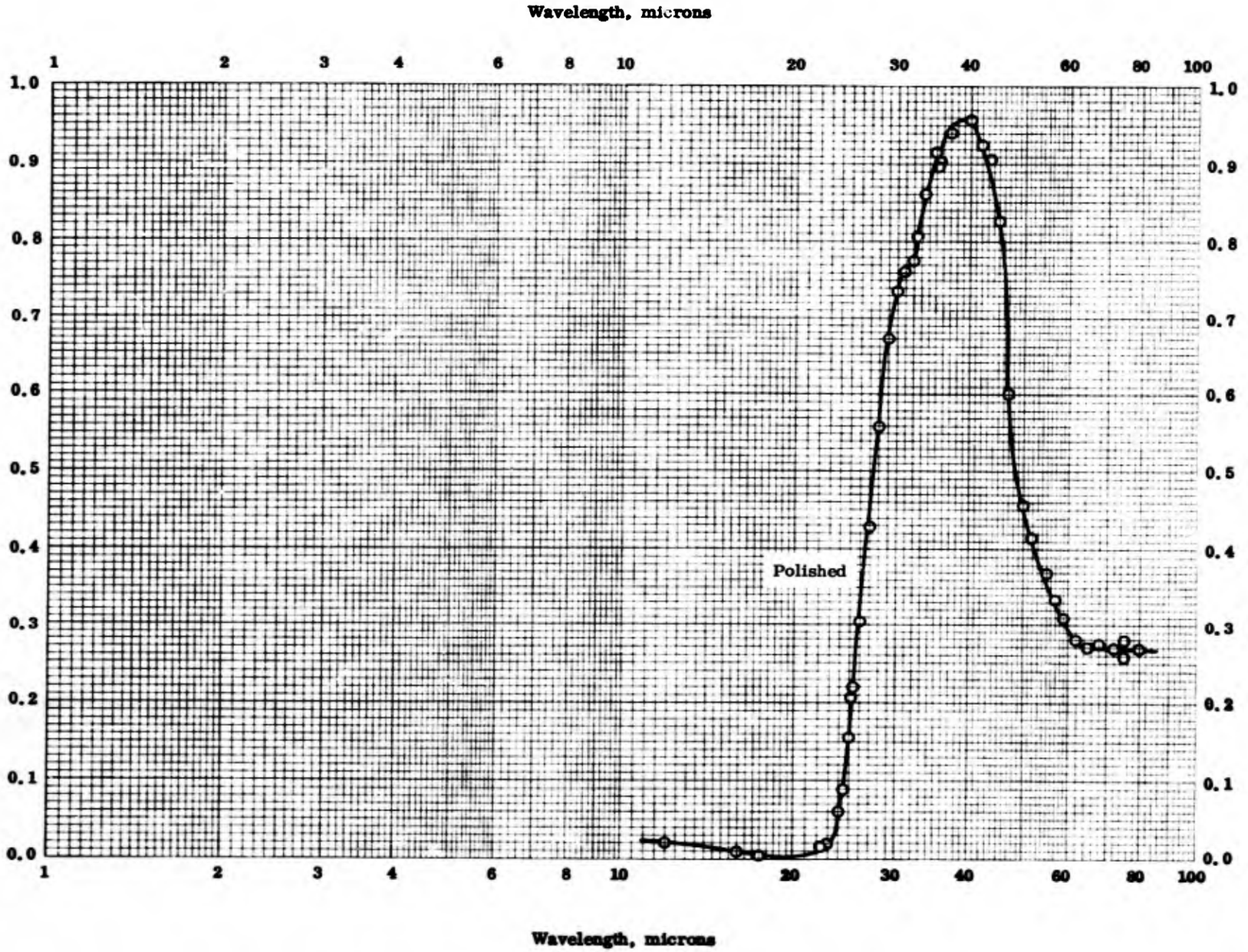


SPECIFIC HEAT -- STRONTIUM FLUORIDE

SPECIFIC HEAT -- STRONTIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-23	11-300		SiF_2; 0.001-0.01 Ca and K, traces of Cu, Fe and Mg.	Washed and dried several hrs at 600 C.



NORMAL SPECTRAL REFLECTANCE -- STRONTIUM FLUORIDE

NORMAL SPECTRAL REFLECTANCE -- STRONTIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	62-28	298	12-80		SrF_2.	Surface polished by using standard metallographic polishing method, back surface roughened; normal incidence.

PROPERTIES OF THORIUM FLUORIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	6.32*	394*
Melting Point	1383	2489
Heat of Fusion	9.1	16
Heat of Vaporization. . .	$226_{1520\,K}$	$408_{2730\,R}$
Heat of Sublimation . . .	$250_{1180\,K}$	$450_{2120\,R}$

*Handbook of Chemistry and Physics (Ref. 64-18)

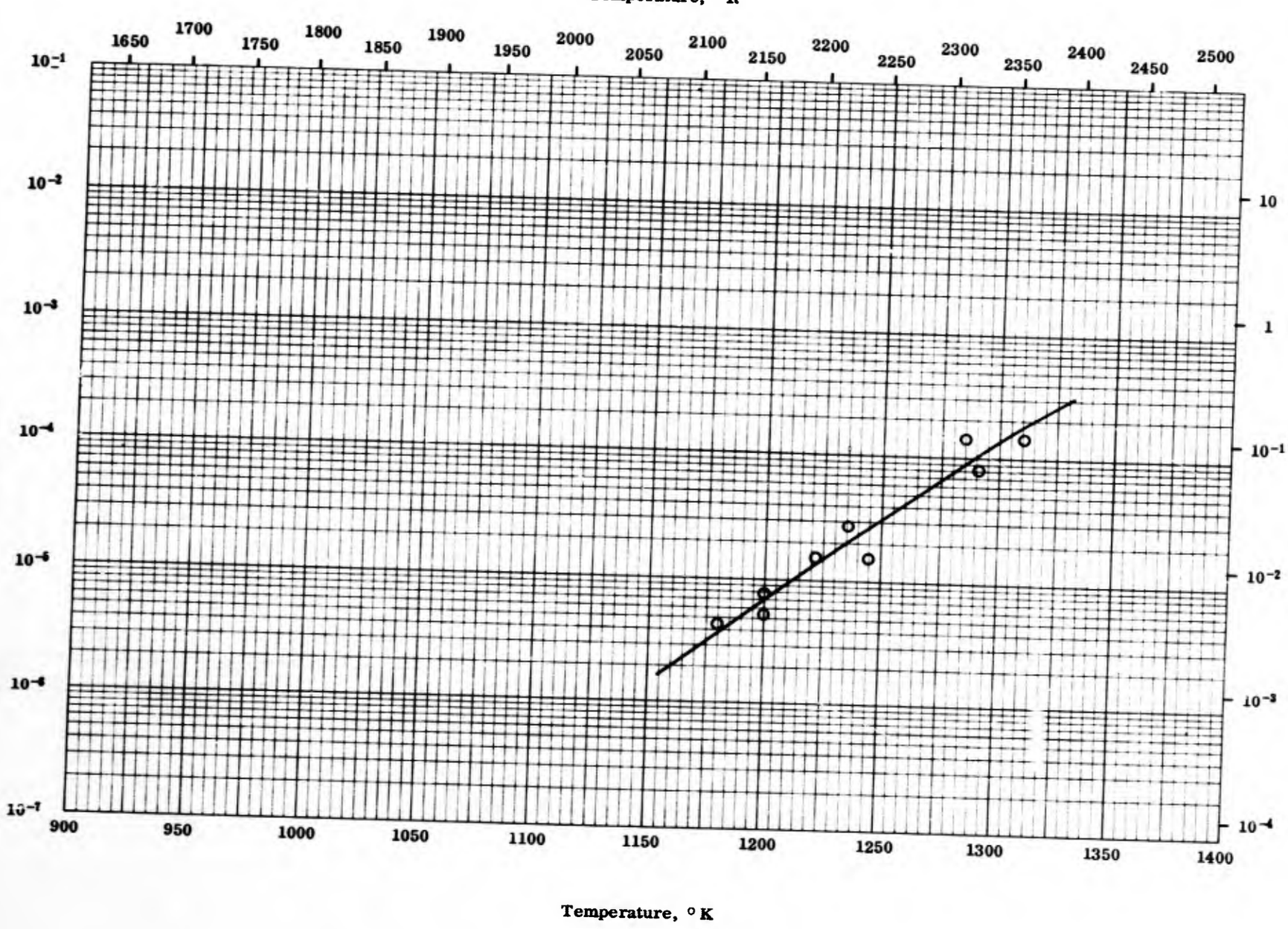
REPORTED VALUES

Melting Point		K	R
	○	1383	2489
	◇	1375 ± 5	2475 ± 9
Heat of Fusion		cal g^{-1}	Btu lb^{-1}
	△	$9.1_{1383\,K}$	$16_{2489\,R}$
Heat of Vaporization		cal g^{-1}	Btu lb^{-1}
	▽	$226_{1516\,K}$ ± 0.5	$408_{2729\,R}$ ± 0.9
	□	$205_{1933\,K}$	$370_{3479\,R}$
Heat of Sublimation		cal g^{-1}	Btu lb^{-1}
	◁	$250_{1176\,K}$ ± 0.3	$450_{2117\,R}$ ± 0.5
	▷	$249_{1383\,K}$	$447_{2489\,R}$

PROPERTIES OF THORIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-1	1383		ThF_4.	M. P. by thermal analysis.
△	57-1	1383		ThF_4.	$\Delta H_f = \Delta h_s - \Delta h_v$
▽	57-1	1516		ThF_4.	ΔH_v from vapor pressure data.
□	57-1	1933		ThF_4.	Same as above.
◁	57-1	1176		ThF_4.	Δh_s from vapor pressure data.
▷	57-1	1383		ThF_4.	Same as above.
◇	62-45	1370-1380		99.8^+ ThF_4.	Measured in Argon.



TPRC

VAPOR PRESSURE -- THORIUM FLUORIDE

VAPOR PRESSURE -- THORIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-5	1180-1311		74.8 Th and 0.2 > O_2 or H_2O each.	Authors stated data tentative; from $\log P\ (atm) = 10.51 - \frac{18740}{°K}$.

PROPERTIES OF OTHER METAL FLUORIDES

REPORTED VALUES

Density*	g cm^{-3}	lb ft^{-3}
AlF_3	2.882	1779.8
ZrF_4	4.43	276
UF_4	6.70 ± 0.10	418.1 ± 6.24
ZnF_2	4.95	308.9
YF_3	4.01	250.2

Melting Point	K	R
AlF_3; subl. point	1514*	2725*
□ ZrF_4	1193**	2148**
△ 98.31 ZrF_4	1167	2101
◇ GdF_3	1501 ± 5	2702 ± 9
● LaF_3	1763 ± 5	3174 ± 9
■ UF_3	1700	3060
▲ UF_4	1233 ± 5	2220 ± 9
▼ YF_3	1421 ± 5	2558 ± 9
◆ ZnF_2	1153	2076

Heat of Sublimation	cal g^{-1}	Btu lb^{-1}
○ AlF_3	844	1519
▽ ZrF_4	340	621

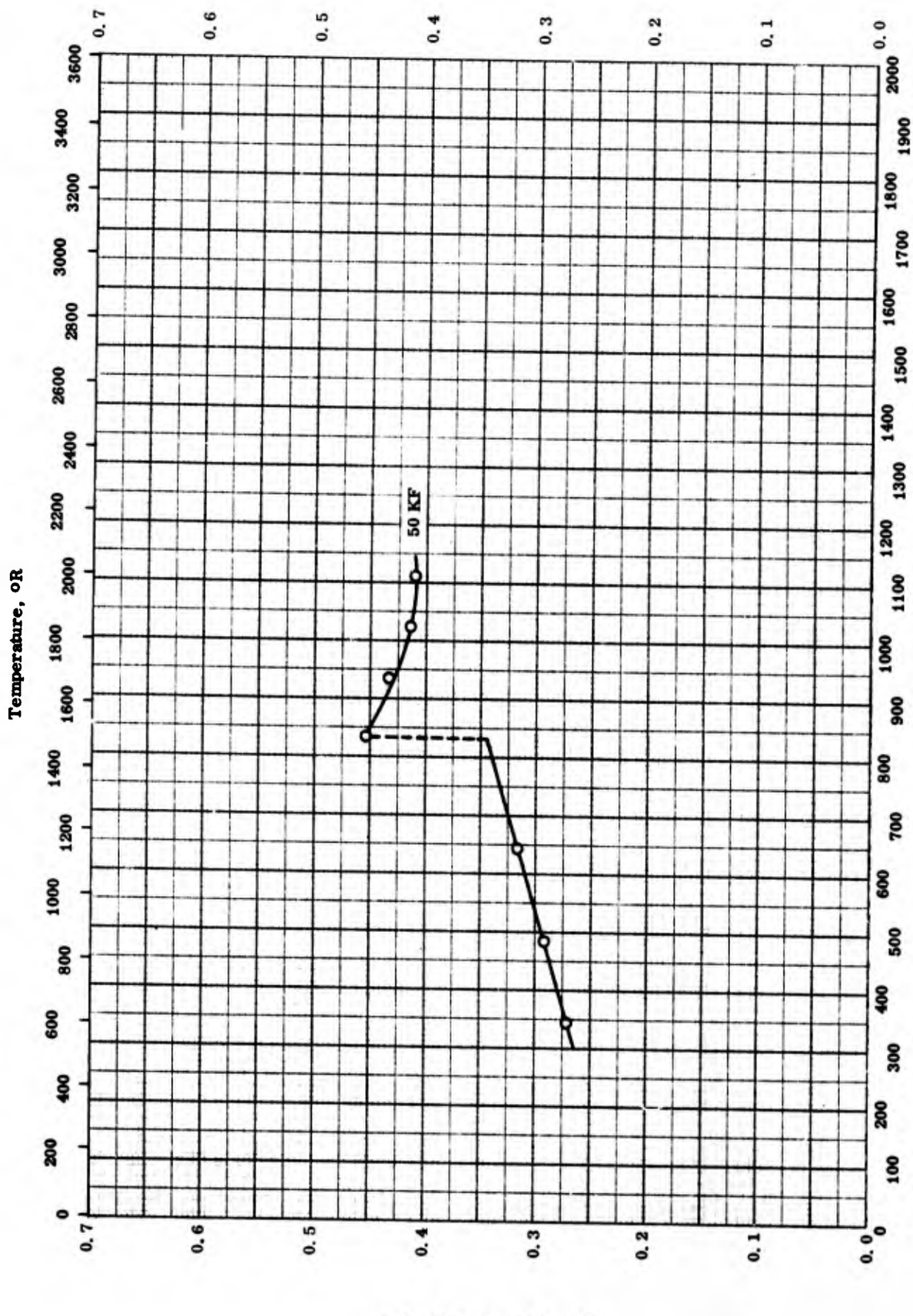
* Handbook of Chemistry and Physics (Ref. 64-18)

** Most probable value for this compound.

PROPERTIES OF OTHER METAL FLUORIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-5	298		AlF_3.	
▽	63-5	298		ZrF_4.	
□	57-3	1193		ZrF_4.	M. P. by vapor pressure data and thermal analysis.
△	57-3	1167		98.31 ZrF_4 and 1.69 LiF.	Same as above.
◇	62-45	1496-1506		99.8+ GdF_3.	Measured in argon.
●	62-45	1758-1768		99.8+ LaF_3.	Same as above.
■	45-3	1700		UF_3.	
▲	43-3	1228-1238		UF_4.	
▼	62-45	1416-1426		99.8+ YF_3.	Measured in argon.
◆	61-24	1153		ZnF_2.	

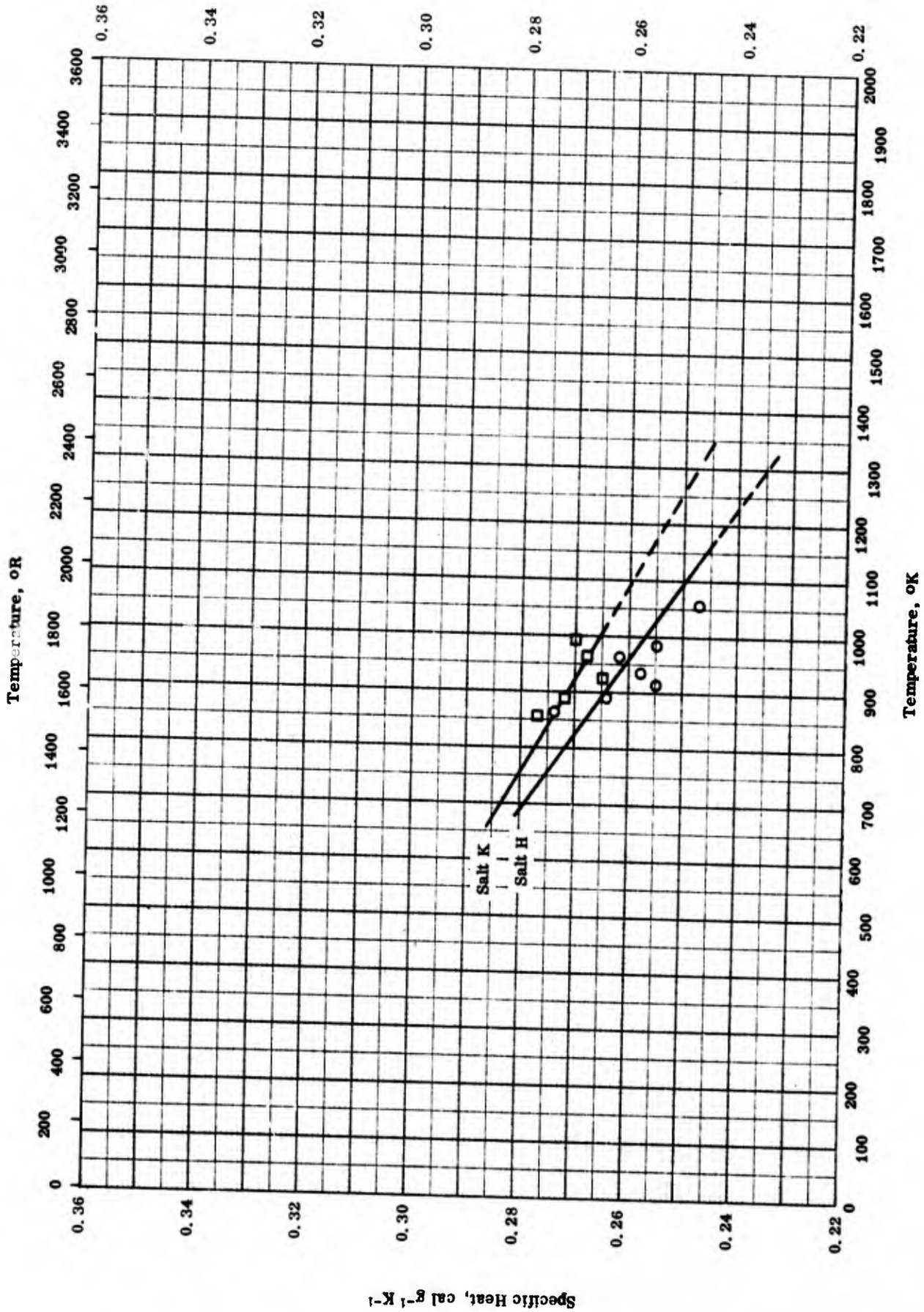


SPECIFIC HEAT -- LITHIUM FLUORIDE + POTASSIUM FLUORIDE

SPECIFIC HEAT -- LITHUM FLUORIDE + POTASSIUM FLORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	58-6	344-1110	2.0	Salt E, Li F-KF; 50.0 KF and 50.0 Li F.	



SPECIFIC HEAT -- SODIUM FLUORIDE + ZIRCONIUM FLUORIDE + URANIUM TETRAFLUORIDE

SPECIFIC HEAT -- SODIUM FLUORIDE +ZIRCONIUM FLUORIDE + URANIUM TETRAFLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	58-6	864-1006	2	Salt H; 57.0 NaF, 38.0 ZrF_4, and 5.0 UF_4.	
□	58-6	857-993		Salt K; 61.0 NaF, 31.0 ZrF_4, and 8.0 UF_4.	

PROPERTIES OF ZIRCONIUM FLUORIDE + LITHIUM FLUORIDE

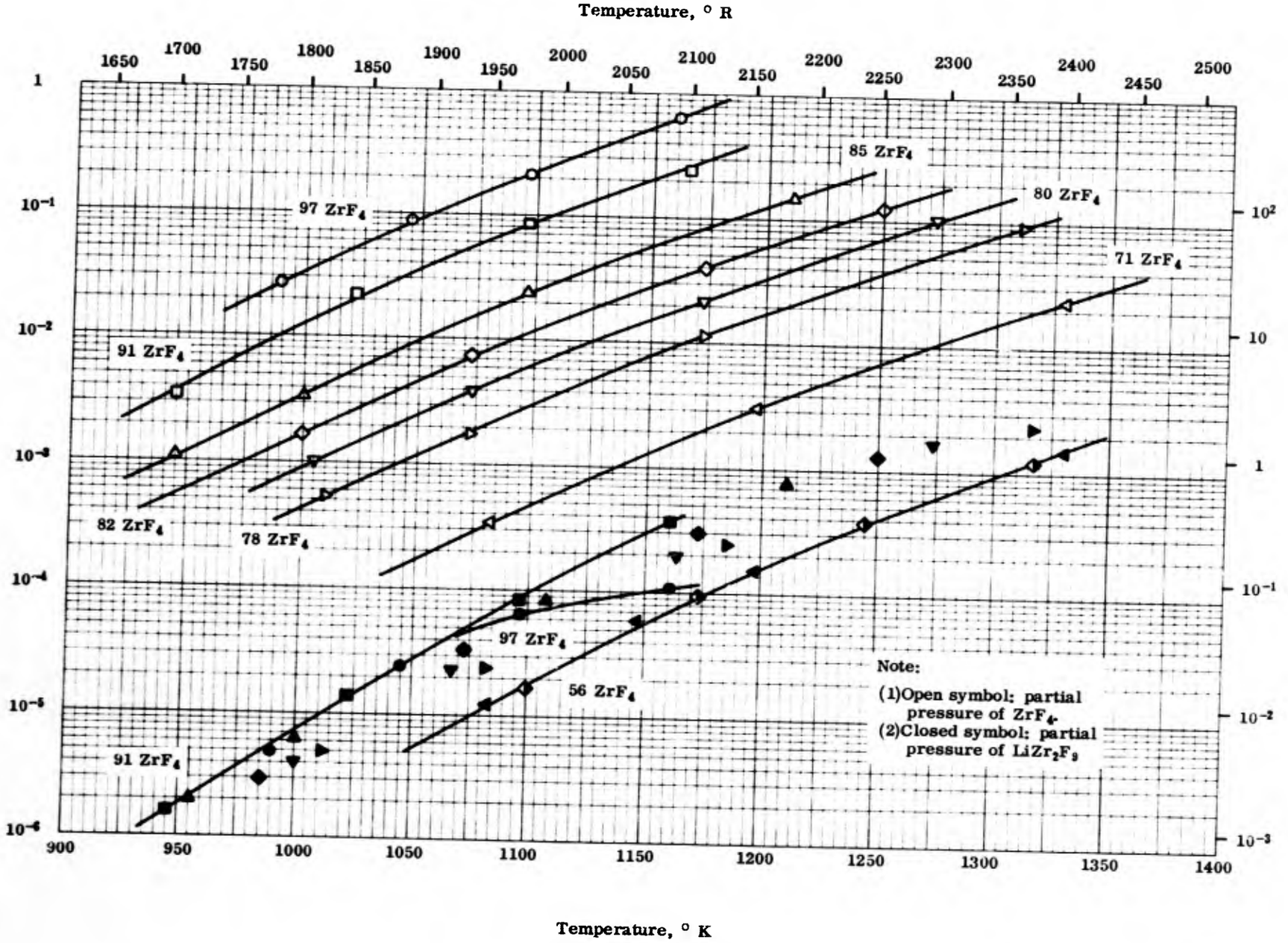
REPORTED VALUES

Melting Point		K	R
○	3.74 LiF	1128	2031
□	6.06 LiF	1073	1932
△	8.52 LiF	973	1752
▽	9.80 LiF	953	1716

PROPERTIES OF ZIRCONIUM FLUORIDE + LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-3	1128		96.26 ZrF_4 and 3.74 LiF.	M. P. by vapor pressure data and thermal analysis.
□	57-3	1073		93.94 ZrF_4 and 6.06 LiF.	Same as above.
△	57-3	973		91.48 ZrF_4 and 8.52 LiF.	Same as above.
▽	57-3	953		90.20 ZrF_4 and 9.80 LiF.	Same as above.



VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + LITHIUM FLUORIDE

VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + LITHIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-3	990-1163	± 8	96.7 ZrF_4 (82 mol%).	Data from least-square eqn; authors believed vapor consists of LiF, ZrF_4 and $LiZr_2F_9$; open symbol: partial pressure of ZrF_4; closed symbol: partial pressure of $LiZr_2F_9$.
□	57-3	943-1165	± 8	91.3 ZrF_4 (61.8 mol%).	Same as above.
△	57-3	948-1212	± 8	85.4 ZrF_4 (47.5 mol%).	Same as above.
◇	57-3	1000-1250	± 8	82.4 ZrF_4 (42.1 mol%).	Same as above.
▽	57-3	1005-1275	± 8	80.4 ZrF_4 (38.8 mol%).	Same as above.
▷	57-3	1010-1316	± 8	77.8 ZrF_4 (35.2 mol%).	Same as above.
◁	57-3	1087-1331	± 8	70.8 ZrF_4 (27.3 mol%).	Same as above.
◆	57-3	1100-1333	± 8	55.7 ZrF_4 (16.3 mol%).	Same as above; pressure of $LiZr_2F_9$ only.

PROPERTIES OF ZIRCONIUM FLUORIDE + RUBIDIUM FLUORIDE

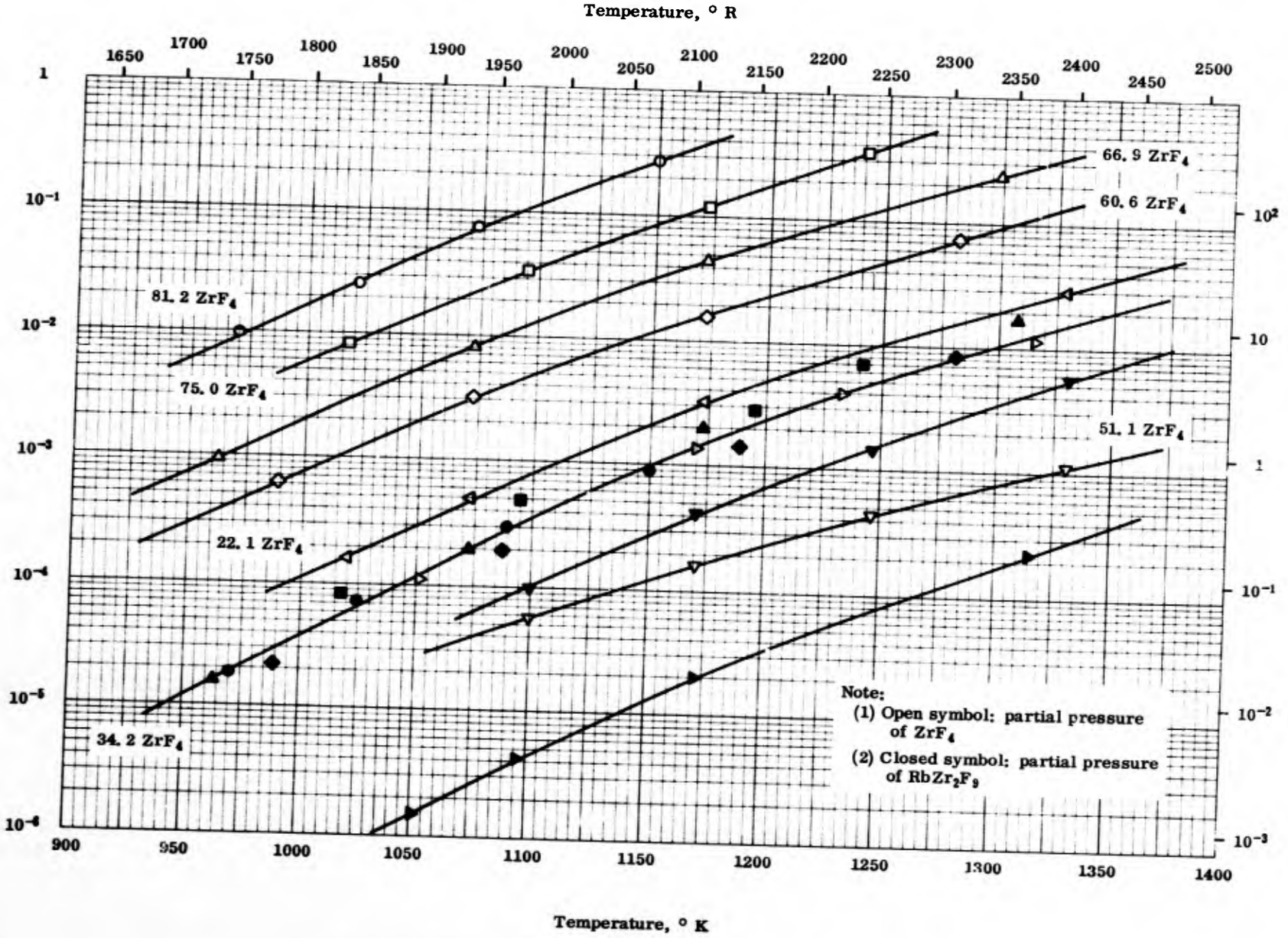
REPORTED VALUES

Melting Point		K	R
○	3.5 RbF	1173	2112
□	10.63 RbF	1123	2022
△	15.7 RbF	1073	1932
▽	22.2 RbF	973	1752
◇	25.6 RbF	873	1572

PROPERTIES OF ZIRCONIUM FLUORIDE + RUBIDIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-3	1173		96.5 ZrF_4 and 3.5 RbF.	M. P. from vapor pressure data and thermal analysis.
□	57-3	1123		89.37 ZrF_4 and 10.63 RbF.	Same as above.
△	57-3	1073		84.3 ZrF_4 and 15.7 RbF.	Same as above.
▽	57-3	973		77.8 ZrF_4 and 22.2 RbF.	Same as above.
◇	57-3	873		74.4 ZrF_4 and 25.6 RbF.	Same as above.



VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + RUBIDIUM FLUORIDE

VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + RUBIDIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-3	971-1149		81.2 ZrF_4; made from "pure salts".	Data from least-square eqn; authors believe vapor consists of RbF, ZrF_4 and $RbZr_2F_9$; open symbol: partial pressure of ZrF_4; closed symbol: partial pressure of $RbZr_2F_9$.
□	57-3	1018-1242		75.0 ZrF_4.	Same as above.
△	57-3	963-1299		66.9 ZrF_4.	Same as above.
◇	57-3	989-1282		60.6 ZrF_4.	Same as above.
▽	57-3	1099-1333		51.1 ZrF_4.	Same as above.
▷	57-3	1052-1316		34.2 ZrF_4.	Same as above except open symbol is partial pressure of RbF.
◁	57-3	1020-1333		22.1 ZrF_4.	Same as above.

PROPERTIES OF ZIRCONIUM FLUORIDE + SODIUM FLUORIDE

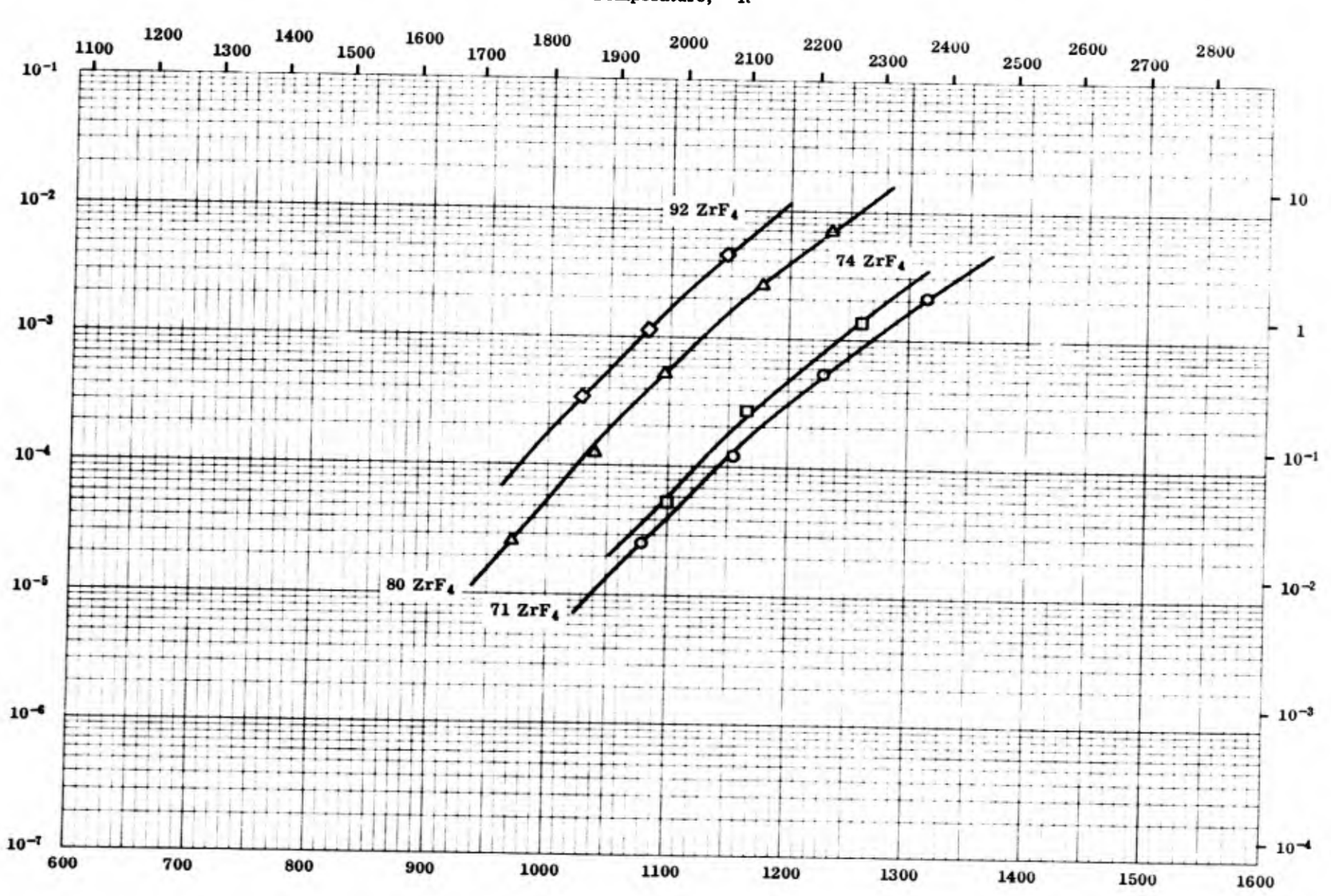
REPORTED VALUES

Melting Point		K	R
○	2.72 NaF	1163	2094
□	5.91 NaF	1119	2015
△	9.71 NaF	1053	1896
▽	11.23 NaF	873	1572
◁	13.19 NaF	973	1752
▷	17.04 NaF	823	1482

PROPERTIES OF ZIRCONIUM FLUORIDE + SODIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-3	1163		97.28 ZrF_4 and 2.72 NaF.	M. P. from vapor pressure data and thermal analysis.
□	57-3	1119		94.09 ZrF_4 and 5.91 NaF.	Same as above.
△	57-3	1053		90.29 ZrF_4 and 9.71 NaF.	Same as above.
▽	57-3	873		88.77 ZrF_4 and 11.23 NaF.	Same as above.
◁	57-3	973		86.81 ZrF_4 and 13.19 NaF.	Same as above.
▷	57-3	823		82.96 ZrF_4 and 17.04 NaF.	Same as above.



VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + SODIUM FLUORIDE

VAPOR PRESSURE -- ZIRCONIUM FLUORIDE + SODIUM FLUORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-174	1081-1313		70.9 ZrF_4.	Corresponding to 38.0 mole %; from least-squares eq. fitted by author with max. deviation of 8% at lowest temp; partial press. of NaF derived on basis that vapor consists only of NaF and ZrF_4.
□	57-174	1099-1258		74.2 ZrF_4.	Corresponding to 41.9 mole %; same as above.
△	57-174	974-1235		79.9 ZrF_4.	Corresponding to 50.0 mole %; same as above.
◇	57-174	1031-1145		91.9 ZrF_4.	Corresponding to 74.0 mole %; same as above.

HYDRIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple hydrogen compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

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PROPERTIES OF LANTHANUM HYDRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	5.14	320.7

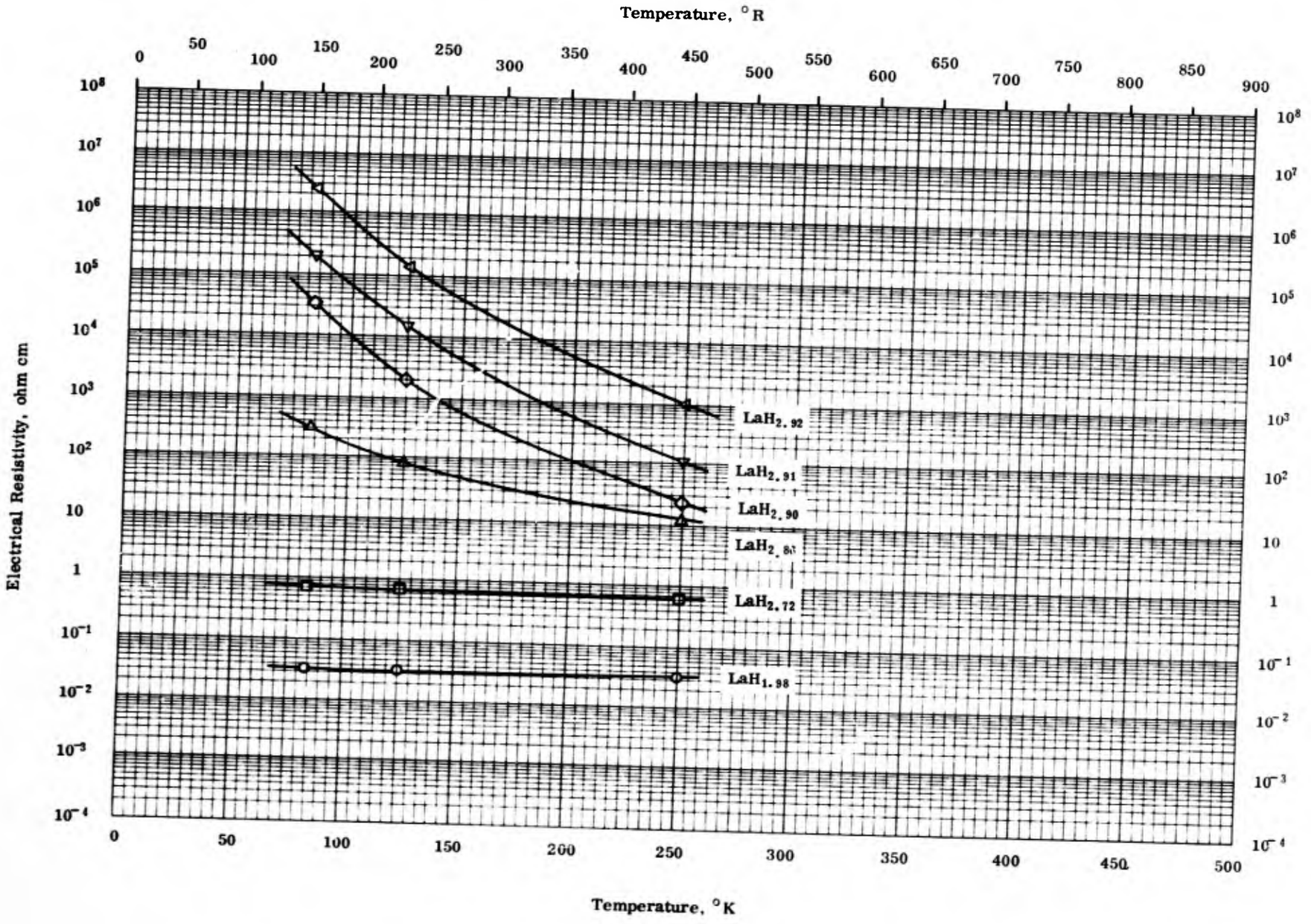
REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
LaH_2	O	5.14	320.7

PROPERTIES OF LANTHANUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-44	298		LaH_2.	



ELECTRICAL RESISTIVITY -- LANTHANUM HYDRIDES

Electrical Resistivity, ohm cm

ELECTRICAL RESISTIVITY -- LANTHANUM HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-14	83-250		$LaH_{1.98}$.	Meas. made at 50 and 1000 cycles AC.
□	57-14	83-250		$LaH_{2.72}$.	Same as above.
△	57-14	83-250		$LaH_{2.86}$.	Same as above.
◇	57-14	83-250		$LaH_{2.90}$.	Same as above.
▽	57-14	83-250		$LaH_{2.91}$.	Same as above.
◁	57-14	83-250		$LaH_{2.92}$.	Same as above.

PROPERTIES OF LITHIUM HYDRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	0.775	48.4
Melting Point	957	1723
Heat of Fusion	880	1580
Heat of Vaporization . . .	1966	3539

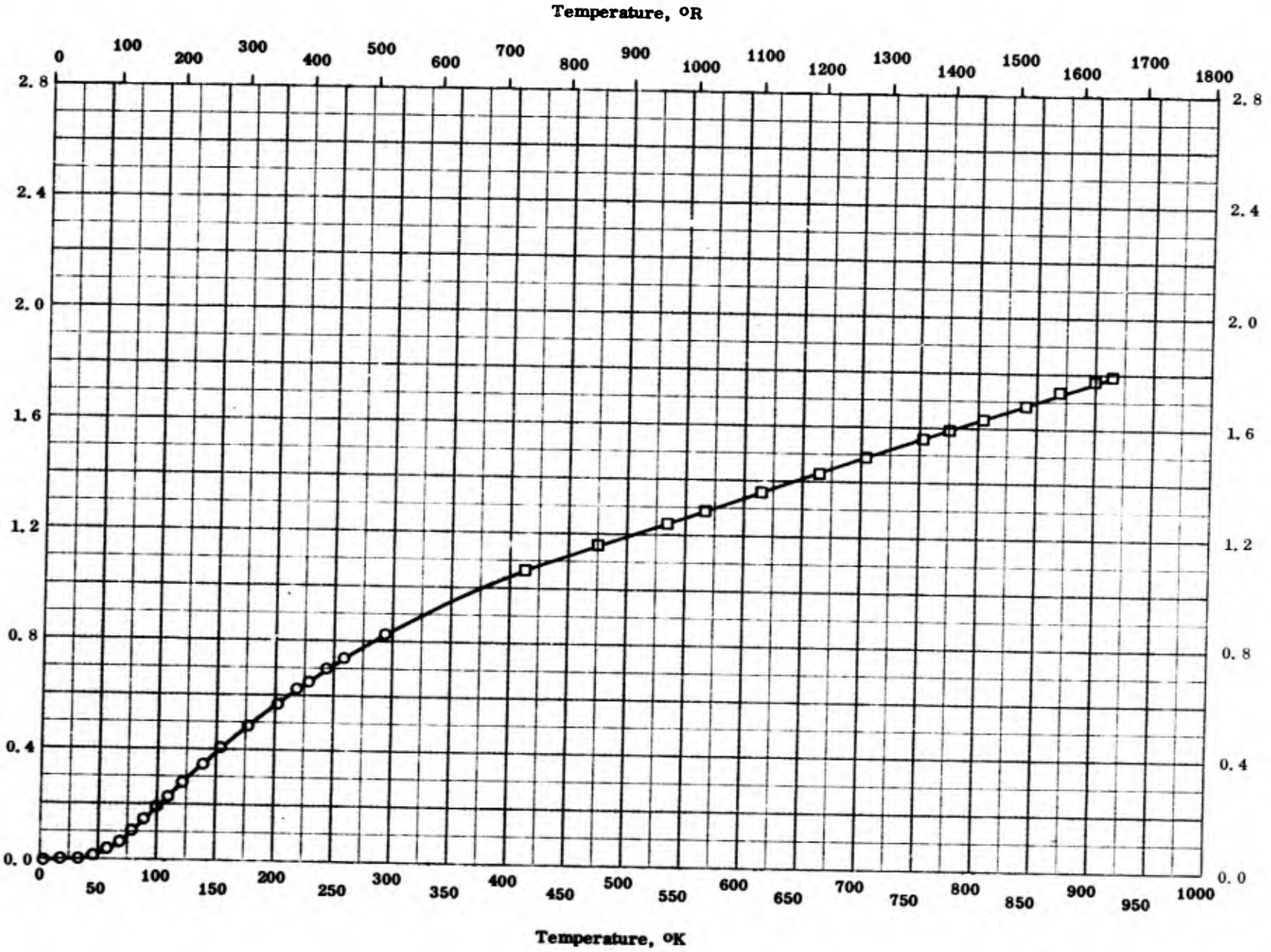
REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
	●	0.775	48.4
Melting Point		K	R
	○	957 ± 1	1723 ± 1.8
	□	956 ± 0.7	1722 ± 1.3
Heat of Fusion		$cal\ g^{-1}$	$Btu\ lb^{-1}$
	△	880 ± 250	1580 ± 450
	■	616.5	1109.7
Heat of Vaporization		$cal\ g^{-1}$	$Btu\ lb^{-1}$
	▲	1966	3539

PROPERTIES OF LITHIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	55-14	956		Pure LiH.	Prepared from Li metal and H_2 gas by heating at 720 C for 10 hrs at 1 atm; M. P. by breaking in time-temperature curve.
○	55-14	957		99.8 LiH, 0.05 > Li_2C_2.	Same as above.
△	55-14	957		LiH.	Same as above except Δh_f estimated from duration of thermal arrests.
●	61-21	298		LiH.	
■	61-21	---		LiH.	
▲	61-21	---		LiH.	

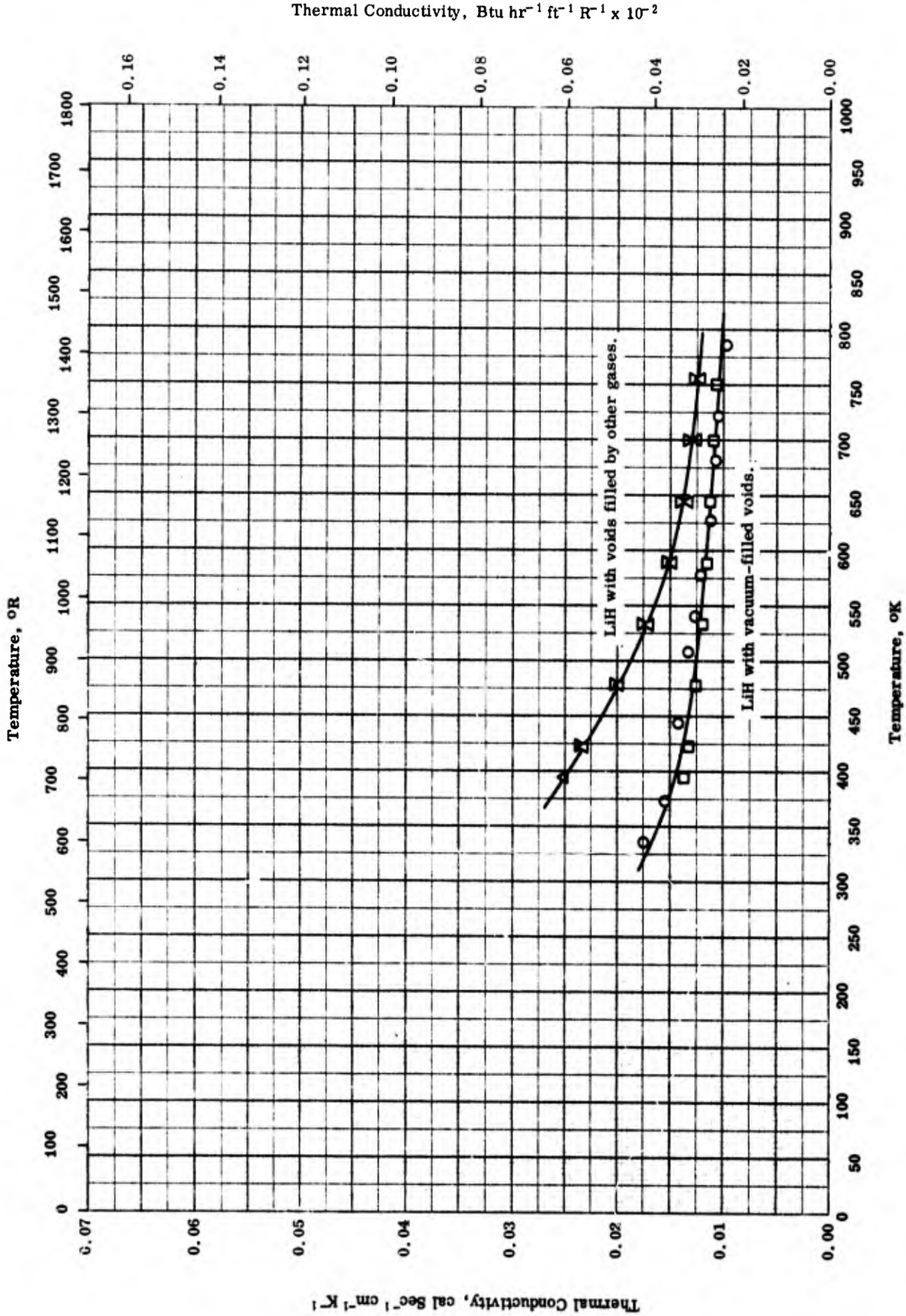


SPECIFIC HEAT -- LITHIUM HYDRIDE

SPECIFIC HEAT -- LITHIUM HYDRIDE

REFERENCE INFORMATION

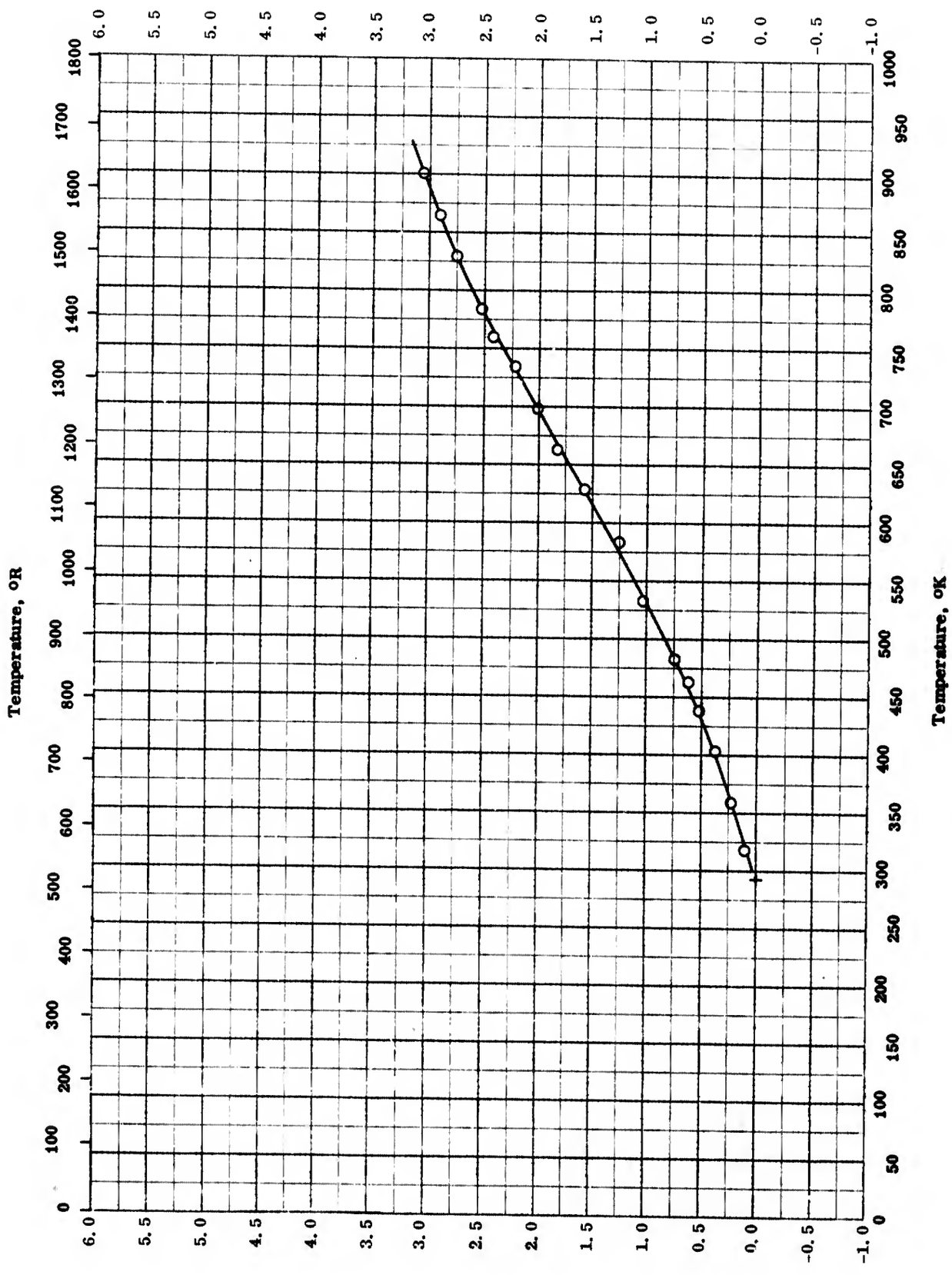
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-14	4-296		LiH; 99.8 LiH.	Under dry nitrogen atm. above 12 K and helium below 12 K.
□	58-4 also 59-11	413-913	<3	LiH.	Helium atm.


Thermal Conductivity, Btu hr⁻¹ ft⁻¹ R⁻¹ x 10⁻²
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Temperature, °R
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
LiH with voids filled by other gases.
LiH with vacuum-filled voids.
Temperature, °K
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
Thermal Conductivity, cal Sec⁻¹ cm⁻¹ K⁻¹
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00

THERMAL CONDUCTIVITY -- LITHIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	58-4	335-786		LiH.	
□	62-10	422-755		LiH.	Cast; with vacuum-filled voids.
△	62-10	422-755		LiH.	Cast; with helium-filled voids.
▽	62-10	422-755		LiH.	Cast; with hydrogen-filled voids.



THERMAL LINEAR EXPANSION -- LITHIUM HYDRIDE

THERMAL LINEAR EXPANSION -- LITHIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	58-4	301-900		Not given.	Tested in He atmosphere.

PROPERTIES OF THORIUM HYDRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	9.2	574

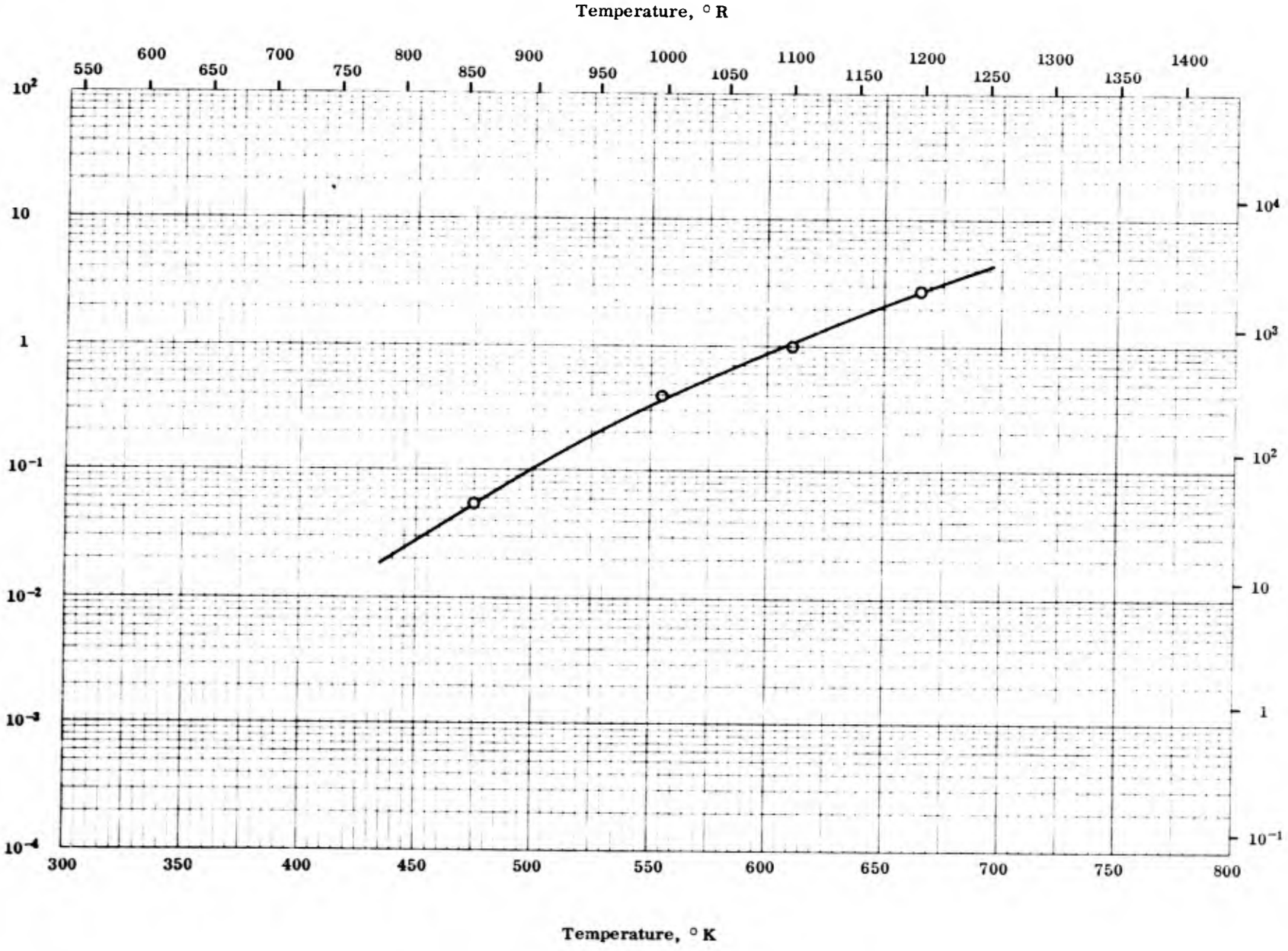
REPORTED VALUES

Density	$g\ cm^{-3}$	$lb\ ft^{-3}$
O	9.2	574

PROPERTIES OF THORIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	48-5	298		ThH_2.	Reacted pure Th with pure H_2 by heating to 400 - 450 C; density computed from x-ray measurements of lattice.

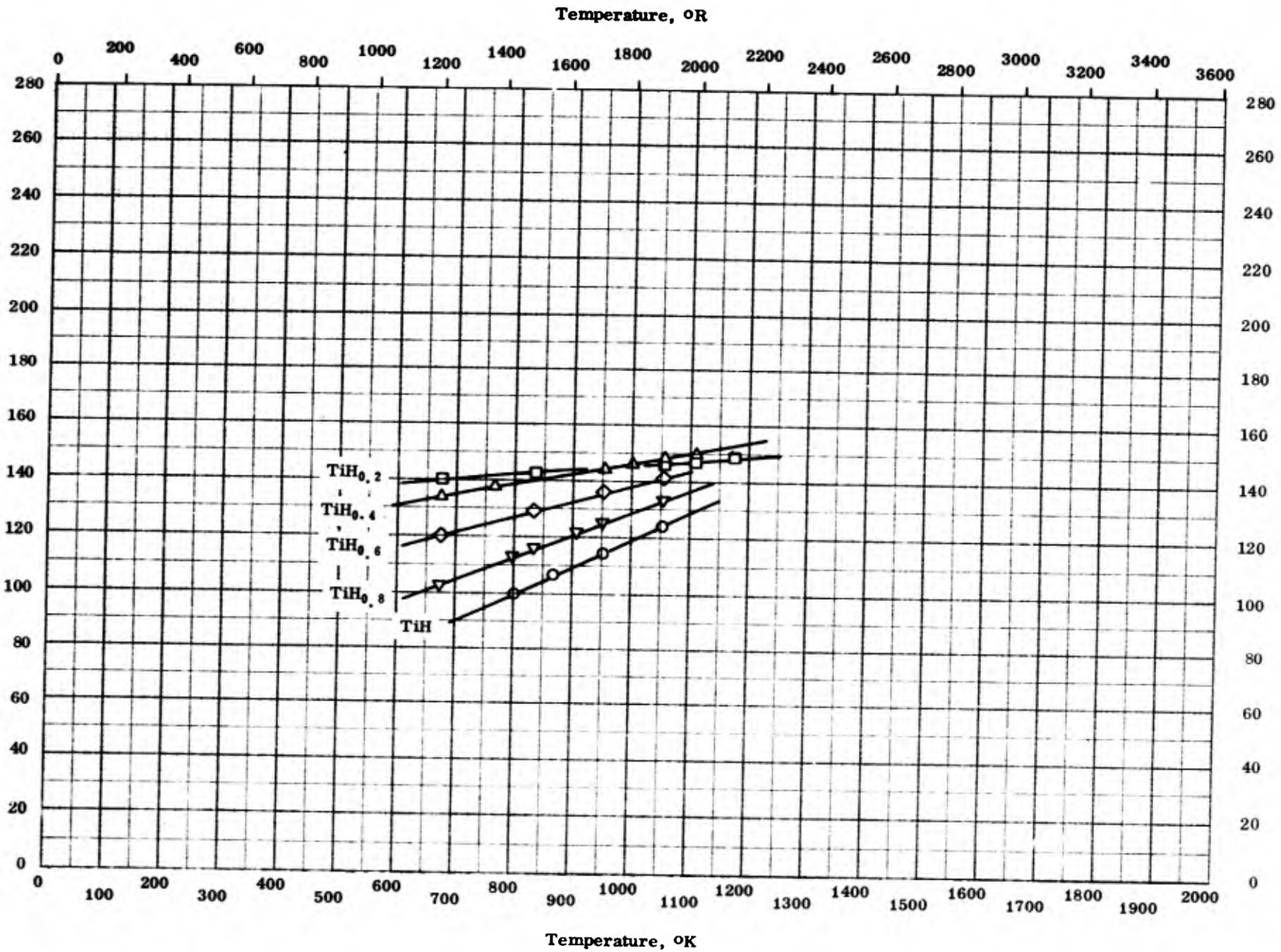


VAPOR PRESSURE -- THORIUM HYDRIDE

VAPOR PRESSURE -- THORIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	45-1	476-667		$ThH_{3.20}$.	$ThH_4 \rightarrow ThH_2 + H_2$.

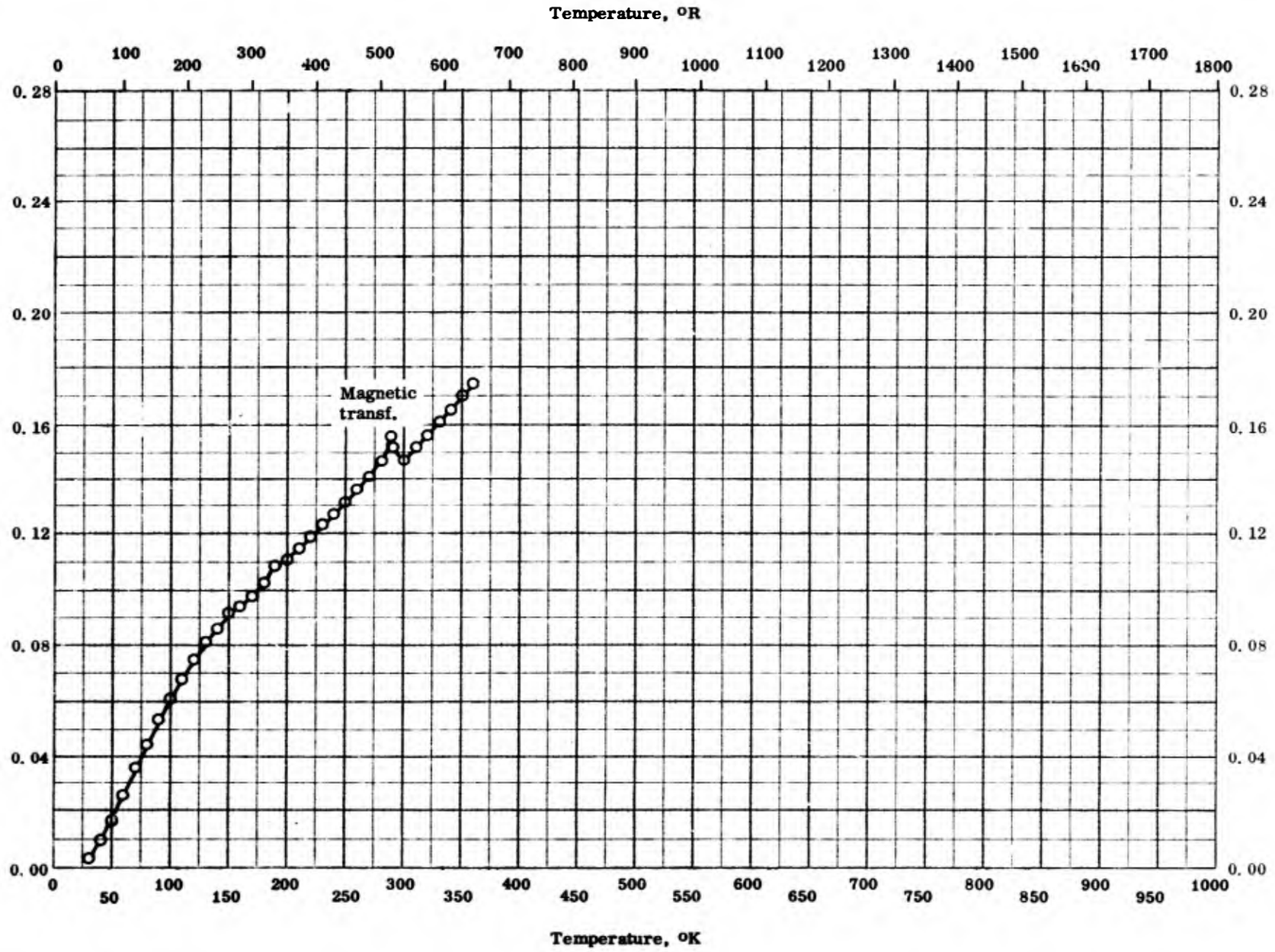


ELECTRICAL RESISTIVITY -- TITANIUM HYDRIDE

ELECTRICAL RESISTIVITY -- TITANIUM HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	56-6	673-1177		$TiH_{0.2}$.	Rod of iodide - Ti in equilibrium with H_2 atm.
△	56-6	673-1111		$TiH_{0.4}$.	Same as above.
◇	56-6	673-1053		$TiH_{0.6}$.	Same as above.
▽	56-6	673-1053		$TiH_{0.8}$.	Same as above.
○	56-6	800-1053		$TiH_{1.0}$.	Same as above.



SPECIFIC HEAT -- TITANIUM HYDRIDE

SPECIFIC HEAT -- TITANIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-16	24-363	1.0	$TiH_{1.97}$.	

PROPERTIES OF URANIUM HYDRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	11	690

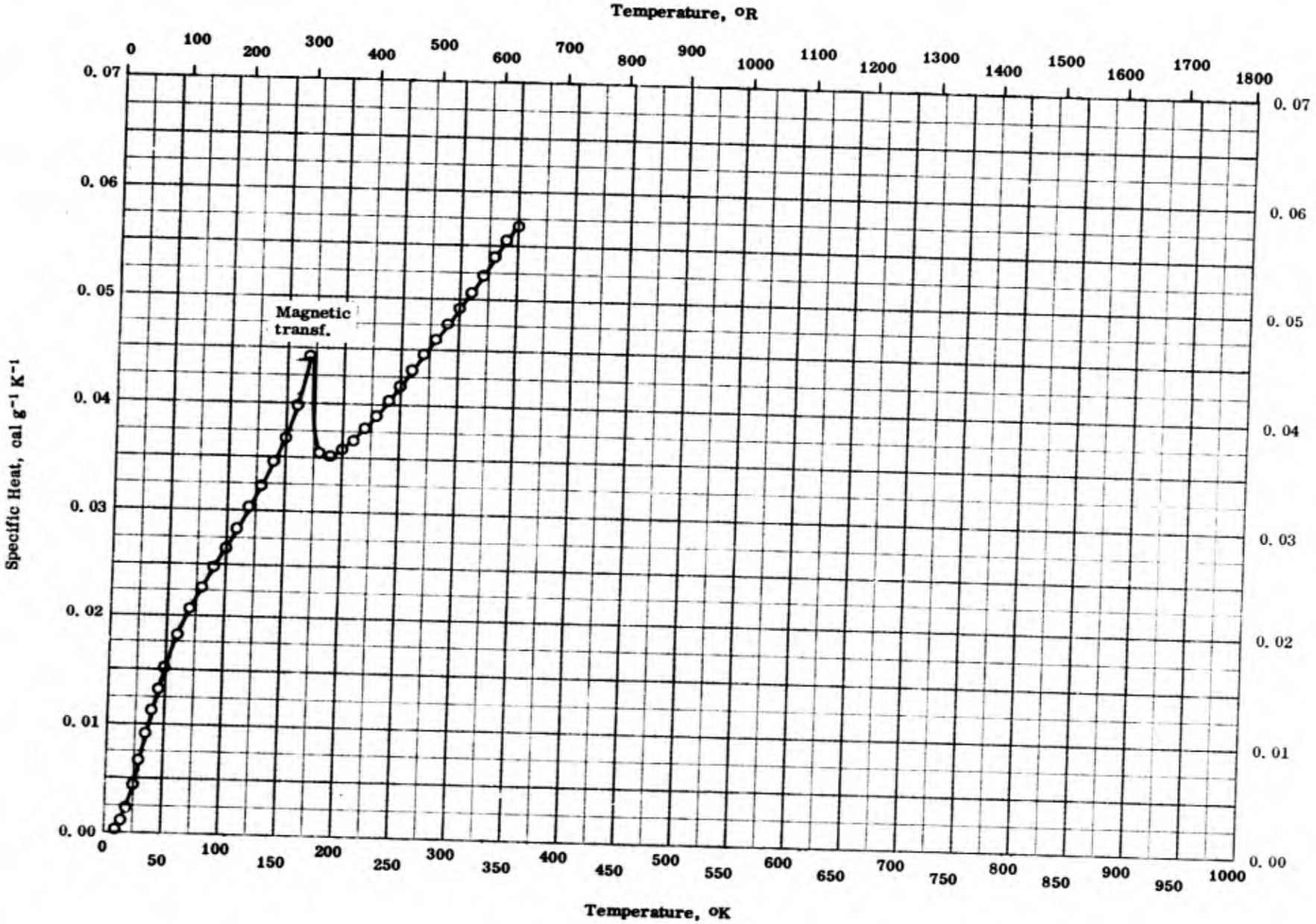
REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
	○	8.7	543
	□	3.4	212
	△	11.4	712
	▽	10.95 ± 0.10	684 ± 6
	▷	10.95 ± 0.10	684 ± 6
	◁	10.92 ± 0.01	681.7 ± 0.6

PROPERTIES OF URANIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-8	298		UH_3.	Compressed at 22600 atm.
□	49-8	298		UH_3.	Compressed at 126 atm.
△	49-8	298		UH_3.	Approx. particle density.
▽	49-8	298		UH_3.	Particle density.
▷	45-4	298		UH_3.	Synthesized at 600 C and 1800 psi.
◁	45-4	298		UH_3.	Same as above.

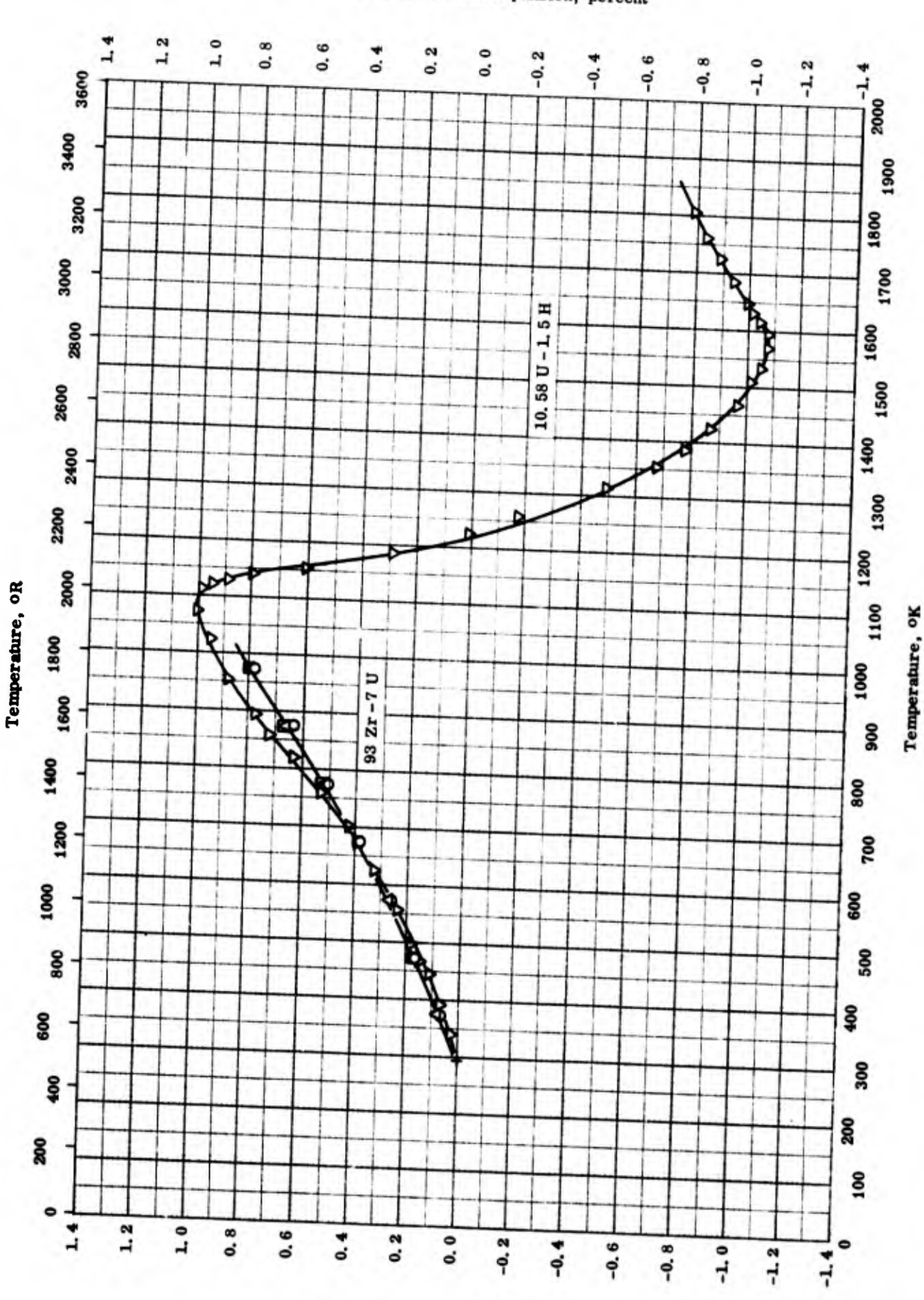


SPECIFIC HEAT -- URANIUM HYDRIDE

SPECIFIC HEAT -- URANIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	59-7	5-350	< 5	99.6 UH_3, and 0.06 O_2.	Prepared by direct reaction of high purity uranium metal and hydrogen above 200 C.

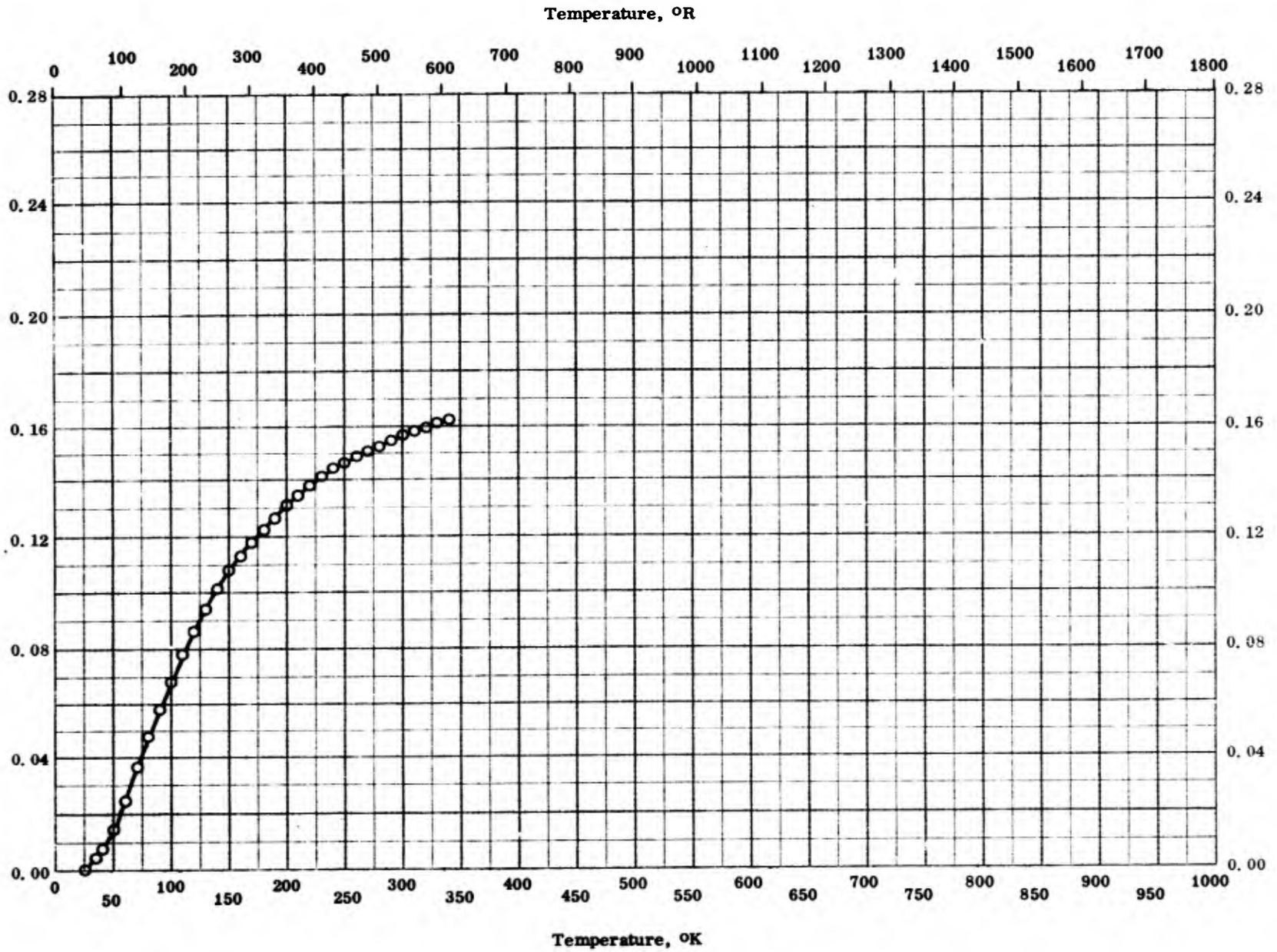


THERMAL LINEAR EXPANSION -- URANIUM ZIRCONIUM HYDRIDES

THERMAL LINEAR EXPANSION -- URANIUM ZIRCONIUM HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-29	293-973		93 Zr - 7 U alloy hydrides; hydrogen content H : Zr = 1.59.	
△	60-29	293-973		93 Zr - 7 U alloy hydrides; hydrogen content H : Zr = 1.71.	
□	60-29	293-973		93 Zr - 7 U alloy hydrides; hydrogen content H : Zr = 1.80.	
▽	63-34	300-1083	2	10.58 U and 1.5 H; specimen 1/2 in. diameter by 6 in. long; density 383 lb ft^{-3}.	Hydrided; measured in H at 1 atm with a heating rate of 5 F per min.



SPECIFIC HEAT -- VANADIUM HYDRIDE

SPECIFIC HEAT -- VANADIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	61-13	25-340		$VH_{0.739}$; prepared from extra pure hydrogen with 99.8 vanadium powder.	

PROPERTIES OF YTTRIUM HYDRIDES

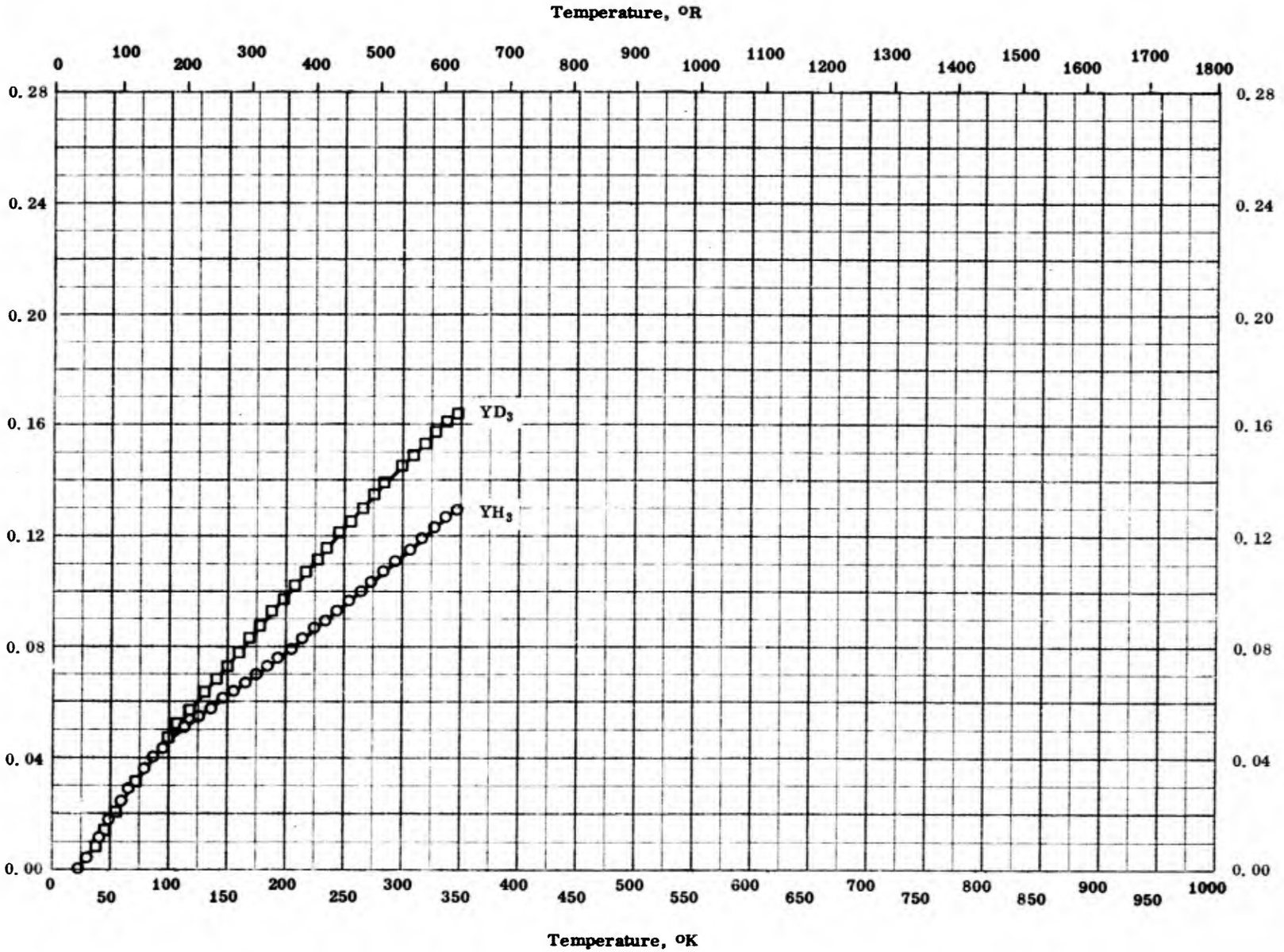
REPORTED VALUES

Density	$g\ cm^{-3}$	$lb\ ft^{-3}$
○ YH_2	4.293	267.9
□ YH_3	3.958	247.0

PROPERTIES OF YTTRIUM HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		YH_2.	
□	62-44	298		YH_3.	



SPECIFIC HEAT -- YTTRIUM HYDRIDE

SPECIFIC HEAT -- YTTRIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-19	5-346	< 1.0	YH_3; 0.1 impurities.	Prepared by reaction of YH_2 and H_2 48 hrs at 350 C and 350 mm Hg; cooled to room temperature over 4 hr period with hydrogen pressure 400 mm Hg.
□	63-19	5-348	< 1.0	YD_3; 0.1 impurities.	Prepared by reaction of YD_2 and deuterium gas.

PROPERTIES OF ZIRCONIUM HYDRIDES

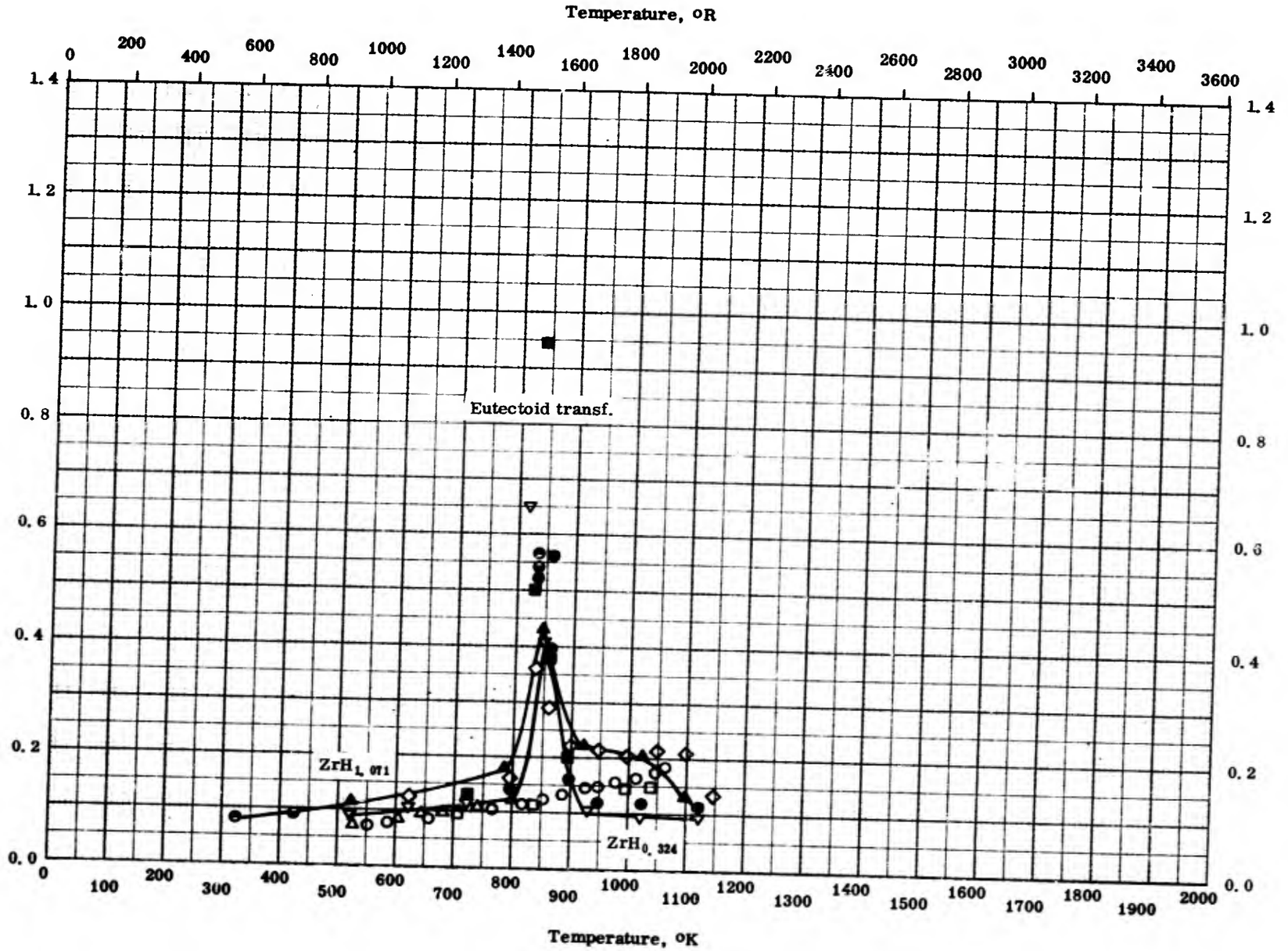
REPORTED VALUES

Density	g cm^{-3}	lb ft^{-3}
O 0.59 H_2	6.29	393

PROPERTIES OF ZIRCONIUM HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-4	298		0.59 H_2.	

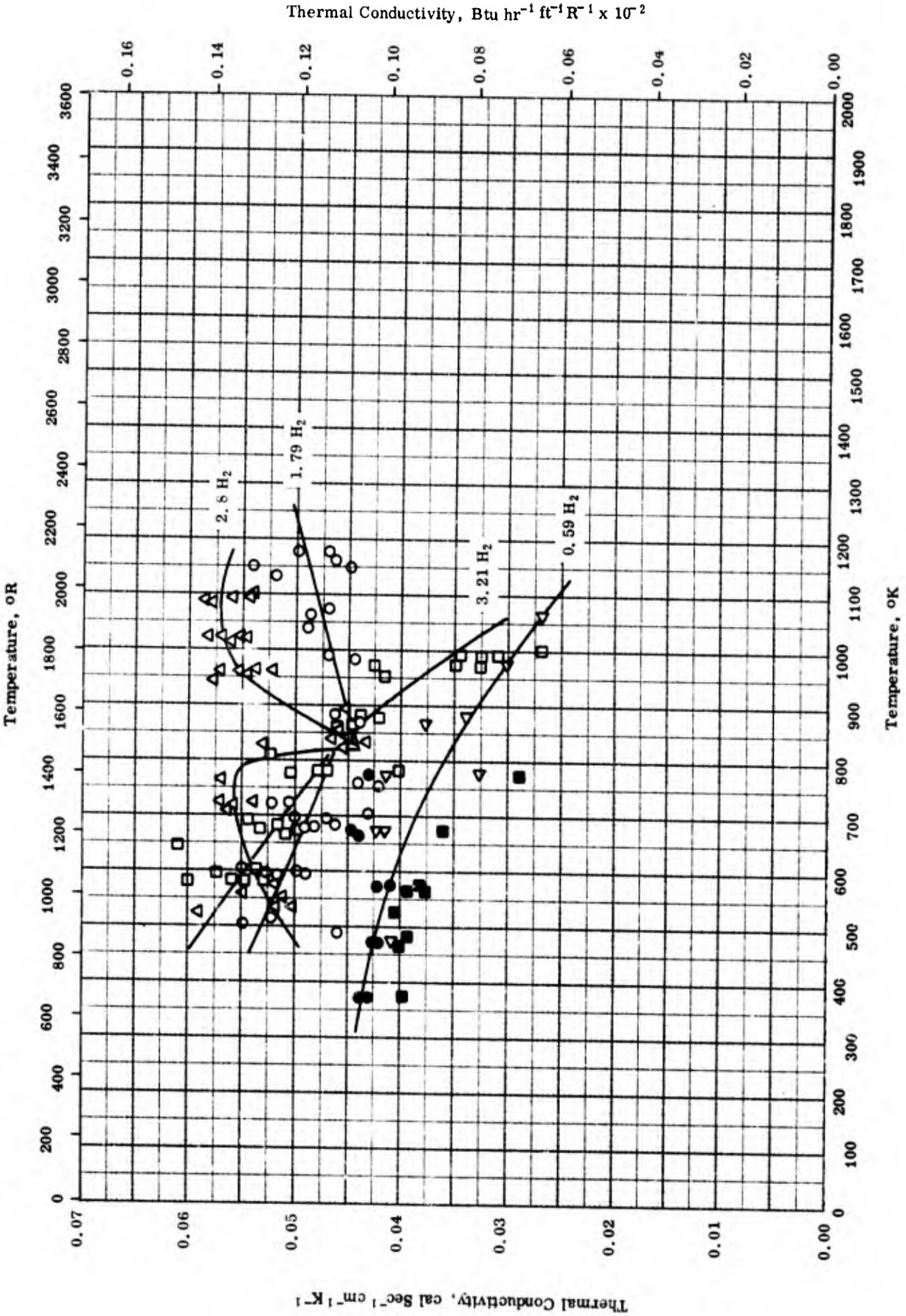


SPECIFIC HEAT -- ZIRCONIUM HYDRIDE

SPECIFIC HEAT -- ZIRCONIUM HYDRIDE

REFERENCE INFORMATION

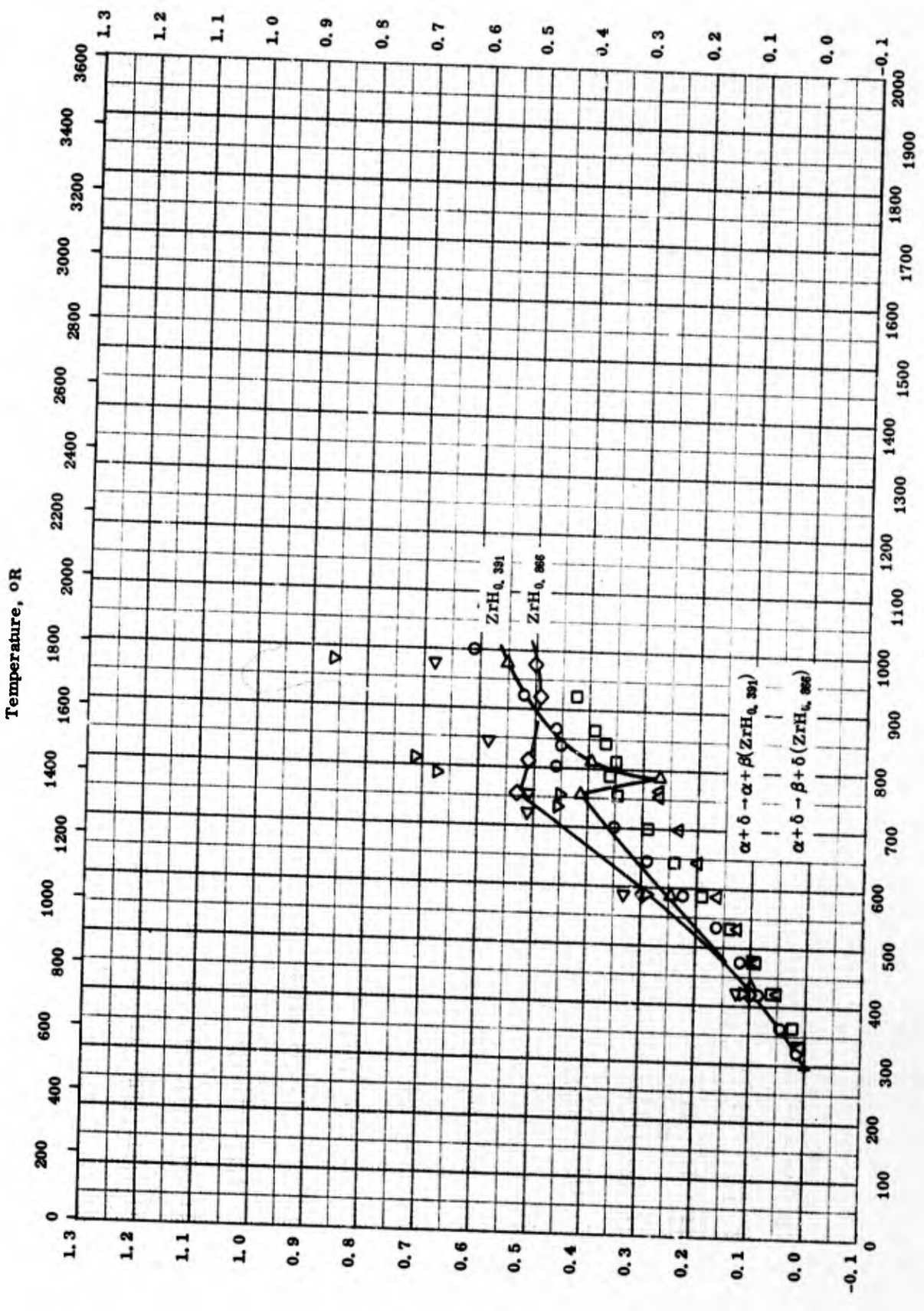
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-3	533-1063		$ZrH_{1.005}$; 99.1 Zr and 1.90 H_2.	
□	62-3	543-1038		$ZrH_{1.22}$; 98.55 Zr and 1.45 H_2.	
△	62-3	528-887		$ZrH_{1.78}$; 98.08 Zr and 1.92 H_2.	
◇	57-17	323-1148		$ZrH_{0.999}$; 1.092 H_2, 0.48 Hf, 0.41 Fe, 0.34 Si, 0.32 C, and 0.17 Al.	
▽	57-17	323-1123		$ZrH_{0.324}$; 0.356 H_2, 0.1 Fe, 0.06 C, 0.01 O_2, 0.01 Al, Cr, Hf, Mn, and N_2.	
●	57-17	323-1123		$ZrH_{0.556}$; 0.88 Fe, 0.611 H_2, 0.60 Hf, 0.48 Si, 0.32 C, 0.12 Al, and 0.10 Cr.	
■	57-17	323-1123		$ZrH_{0.701}$; 0.769 H_2, 0.53 Fe, 0.44 Hf, 0.35 Si, 0.32 C, 0.12 Al, 0.08 Ni, and 0.06 Cr.	
▲	57-17	323-1148		$ZrH_{1.071}$; 1.170 H_2, 0.1 Fe, 0.06 C, 0.017 O_2, 0.01 Al, Cr, Hf, Mn, and N_2.	
◒	56-4	323-1123		$ZrH_{0.556}$; 0.62 H_2.	
⊖	56-4	323-848		$ZrH_{0.701}$.	


Thermal Conductivity, Btu hr⁻¹ ft⁻¹ R⁻¹ x 10⁻²
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Temperature, °R
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
2.8 H2
1.79 H2
3.21 H2
0.59 H2
Temperature, °K
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Thermal Conductivity, cal Sec⁻¹ cm⁻¹ K⁻¹
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00

THERMAL CONDUCTIVITY -- ZIRCONIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
●	56-4	373-773		ZrH_2; 0.59 H_2; density 6.29 g cm^{-3}.	Heated to 700 C and cooled at undetermined rate.
■	56-4	373-773		Same as above.	
◁	56-4	473-1066		Same as above.	
○	62-3	490-1181		ZrH_2; 1.79 H_2; sample in delta structure.	Corresponding to 45.3 atomic % of H_2; prepared in furnace at 900 C by flowing 1 atm hydrogen at a controlled rate over cleaned Zr at 950-1000 C in vacuum; homogenized for 30-60 min and cooled slowly overnight.
△	62-3	526-1101		Same as above except containing 2.80 H_2.	Corresponding to 56.6 atomic % of H_2; same as above.
□	62-3	581-1001		Same as above except containing 3.21 H_2.	Corresponding to 60 atomic % of H_2; same as above.



THERMAL LINEAR EXPANSION -- ZIRCONIUM HYDRIDE

THERMAL LINEAR EXPANSION -- ZIRCONIUM HYDRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-24	322-1000		$ZrH_{0.845}$: 3.62×10^{22} atoms H_2 per cc Zr.	
□	57-24	339-922		$ZrH_{0.576}$: 2.46×10^{22} atoms H_2 per cc Zr.	
△	57-24	339-772		$ZrH_{0.421}$: 1.80×10^{22} atoms H_2 per cc Zr.	
◇	58-11	298-978	6.3	$ZrH_{0.866}$: 3.70×10^{22} atoms H_2 per cc Zr.	
▽	58-11	298-978	6.3	$ZrH_{0.548}$: 2.34×10^{22} atoms H_2 per cc Zr.	
◁	58-11	298-978	6.3	$ZrH_{0.787}$: 3.36×10^{22} atoms H_2 per cc Zr.	
▷	58-11	298-978	6.3	$ZrH_{0.391}$: 1.67×10^{22} atoms H_2 per cc Zr.	

PROPERTIES OF OTHER METAL HYDRIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	CeH_2	5.43	338.8
	PrH_2	5.65	352.6
	NdH_2	5.94	370.6
	GdH_2	7.08	441.8
	GdH_3	6.57	410.0
	SmH_2	6.52	406.8
	SmH_3	6.07	378.8
	DyH_3	7.14	445.5
	TbH_3	6.88	429.3
	ErH_3	7.57	472.3
□	MgH_2	1.419*	88.59*
△	MgH_2	1.45 ± 0.03	90.5 ± 1.9

*Most probable value for this compound.

PROPERTIES OF OTHER METAL HYDRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Hydrides of rare earth metal.	
□	54-11	298		MgH_2.	Computed from x-ray measurements of lattice.
△	54-11	298		MgH_2.	"Directly measured".

IODIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple iodine compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is > 2.0 percent.

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PROPERTIES OF PLUTONIUM TRIIODIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.92*	432*
Melting Point	1050	1890
Heat of Fusion	19.3	34.7
Heat of Vaporization . . .	$63.8_{1650\ K(B.P)}$	$115_{2970\ R\ (B.P.)}$
Heat of Sublimation . . .	111_{0K}	201_{0R}

*Handbook of Chemistry and Physics, (Ref. 64-18)

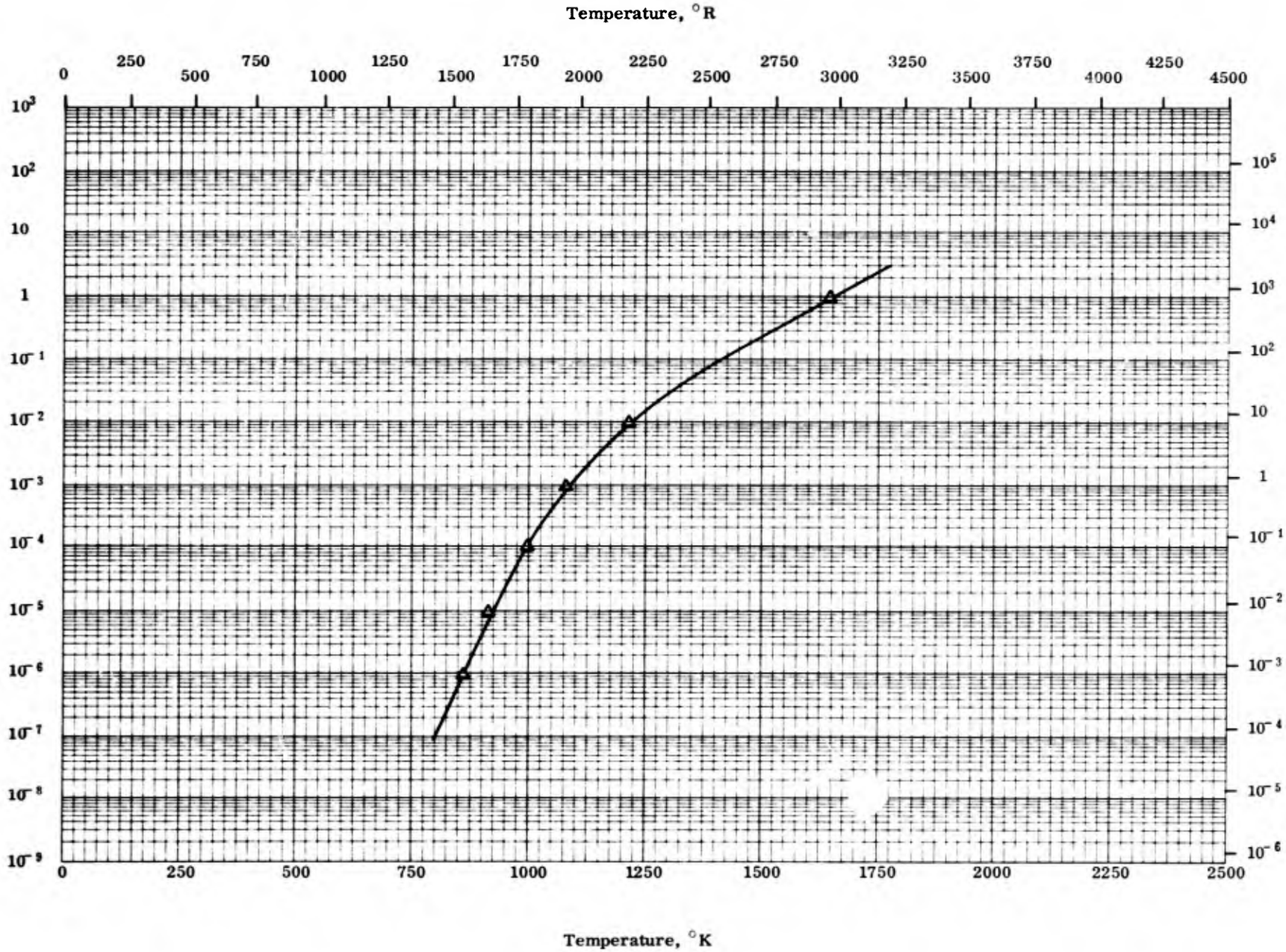
REPORTED VALUES

Melting Point	K	R
○	1050	1890
Heat of Fusion	**cal g^{-1}**	**Btu lb^{-1}**
□	$193_{1050\ K}$	$34.7_{1890\ R}$
Heat of Vaporization	**cal g^{-1}**	**Btu lb^{-1}**
△	95.5_{0K}	170.0_{0R}
▽	$63.8_{1650\ K}$	$114.8_{2970\ R}$
Heat of Sublimation	**cal g^{-1}**	**Btu lb^{-1}**
◇	111_{0K}	200.6_{0R}

PROPERTIES OF PLUTONIUM TRIIODIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-1	1050		PuI_3.	
□	49-1	1050		PuI_3.	
△	49-1	0		PuI_3.	
▽	49-1	1650		PuI_3.	
◇	49-1	0		PuI_3.	

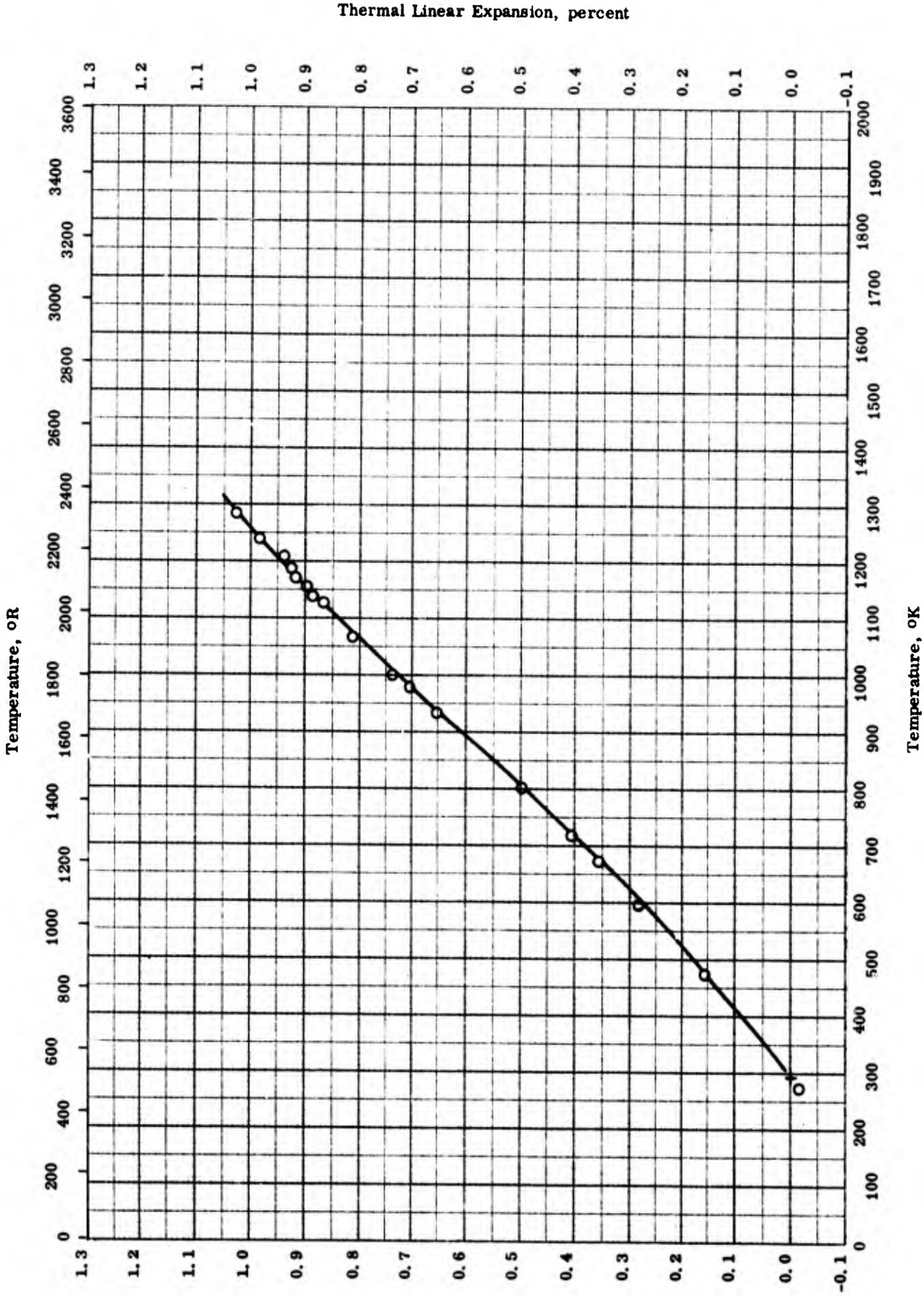


VAPOR PRESSURE -- PLUTONIUM TRIIODIDE

VAPOR PRESSURE -- PLUTONIUM TRIIODIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
Δ	49-1	865-1650		PuI_3.	Estimated from corresponding uranium compound.



THERMAL LINEAR EXPANSION -- TITANIUM IODIDE

THERMAL LINEAR EXPANSION -- TITANIUM IODIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-19	273-1281		99. 94 titanium iodide.	Measured in vacuum of 1×10^{-5} mm Hg with heating rate of 1 C per min.

PROPERTIES OF OTHER METAL IODIDES

REPORTED VALUES

Melting Point		K	R
○	CeI_3	1039	1870
□	UI_3	1030	1854
△	UI_4	773	1391

PROPERTIES OF OTHER METAL IODIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-23	1039		CeI_3	
□	45-3	1030		UI_3	
△	45-3	773		UI_4	

NITRIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple nitrogen compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is < 95.0 percent, or any other constituent is > 2.0 percent.

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PROPERTIES OF ALUMINUM NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	3.26*	203*
Melting Point	2673	4811

*Handbook of Chemistry and Physics. (Ref. 64-18)

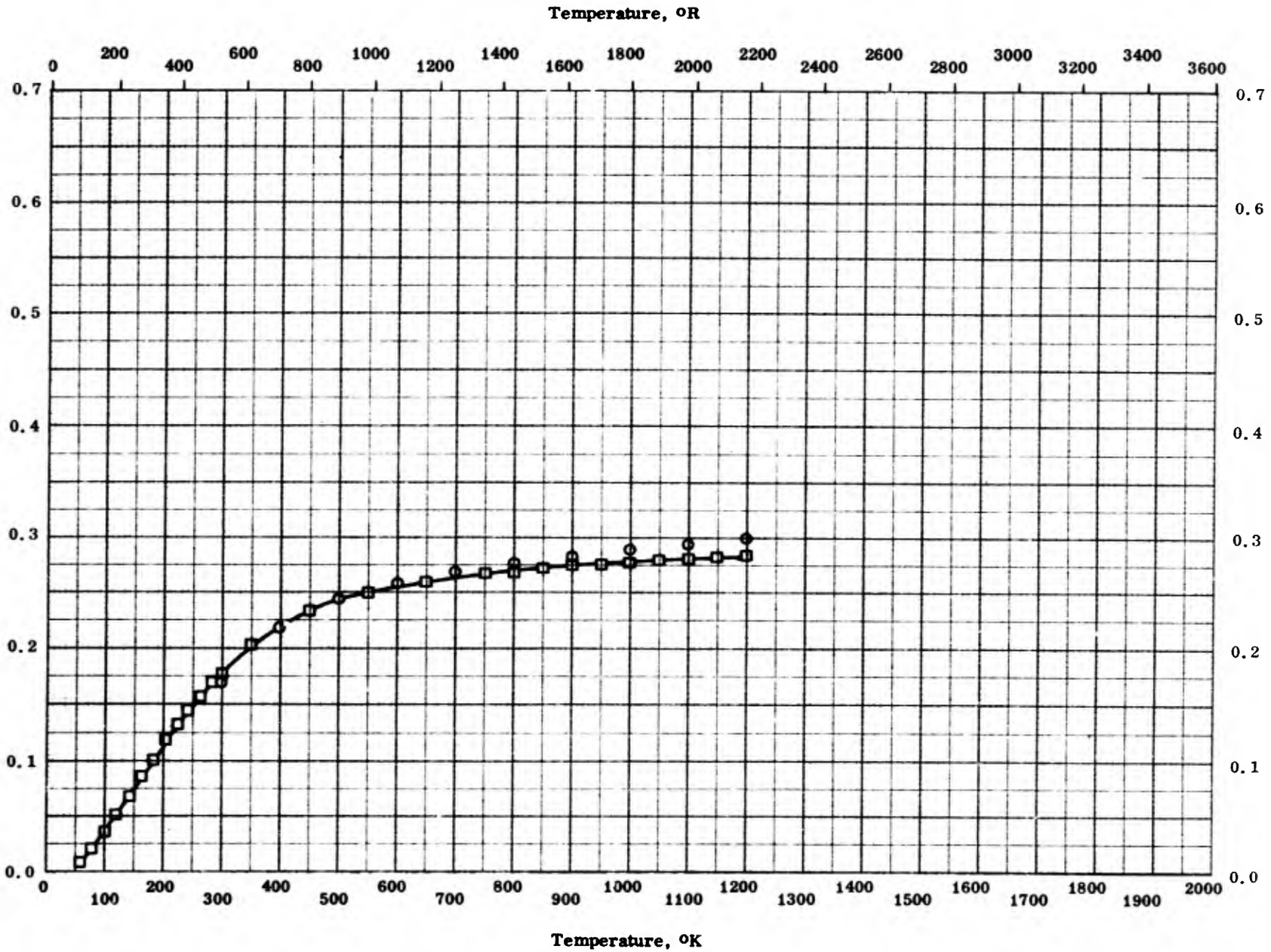
REPORTED VALUES

Melting Point:	K	R
o	> 2673	4811

PROPERTIES OF ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	59-17	2673		Al N.	

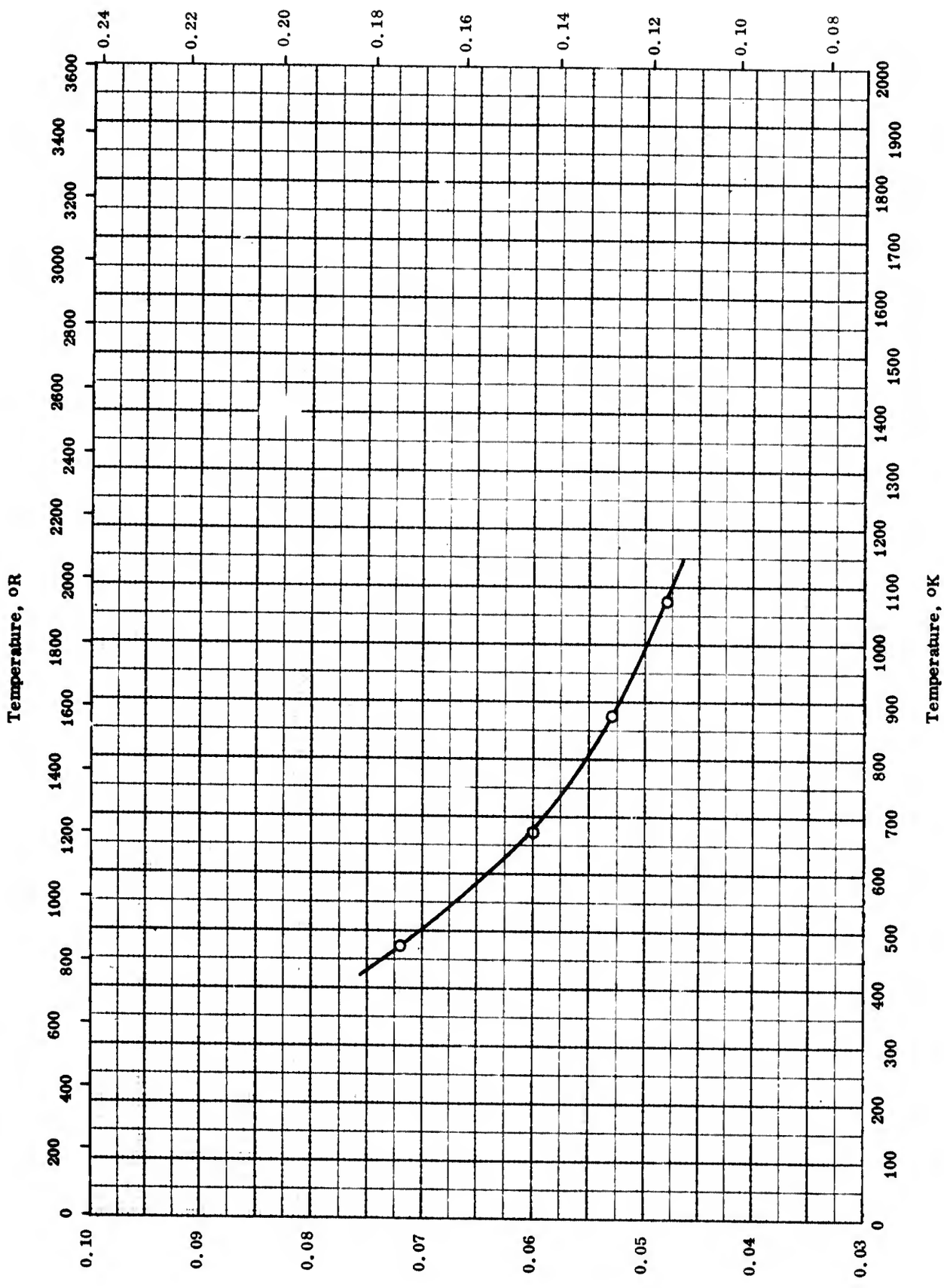


SPECIFIC HEAT -- ALUMINUM NITRIDE

SPECIFIC HEAT -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-1	479-1113	0.5	AlN; traces Cu, Mg, and Si.	
□	61-11	53-1200	0.3-0.9	98.92 AlN, 1.08 Al_2O_3, 0.01-0.05 Fe, 0.01 Si, 0.001> Ca, Cu, and Mg, and 0.0001> Cr.	

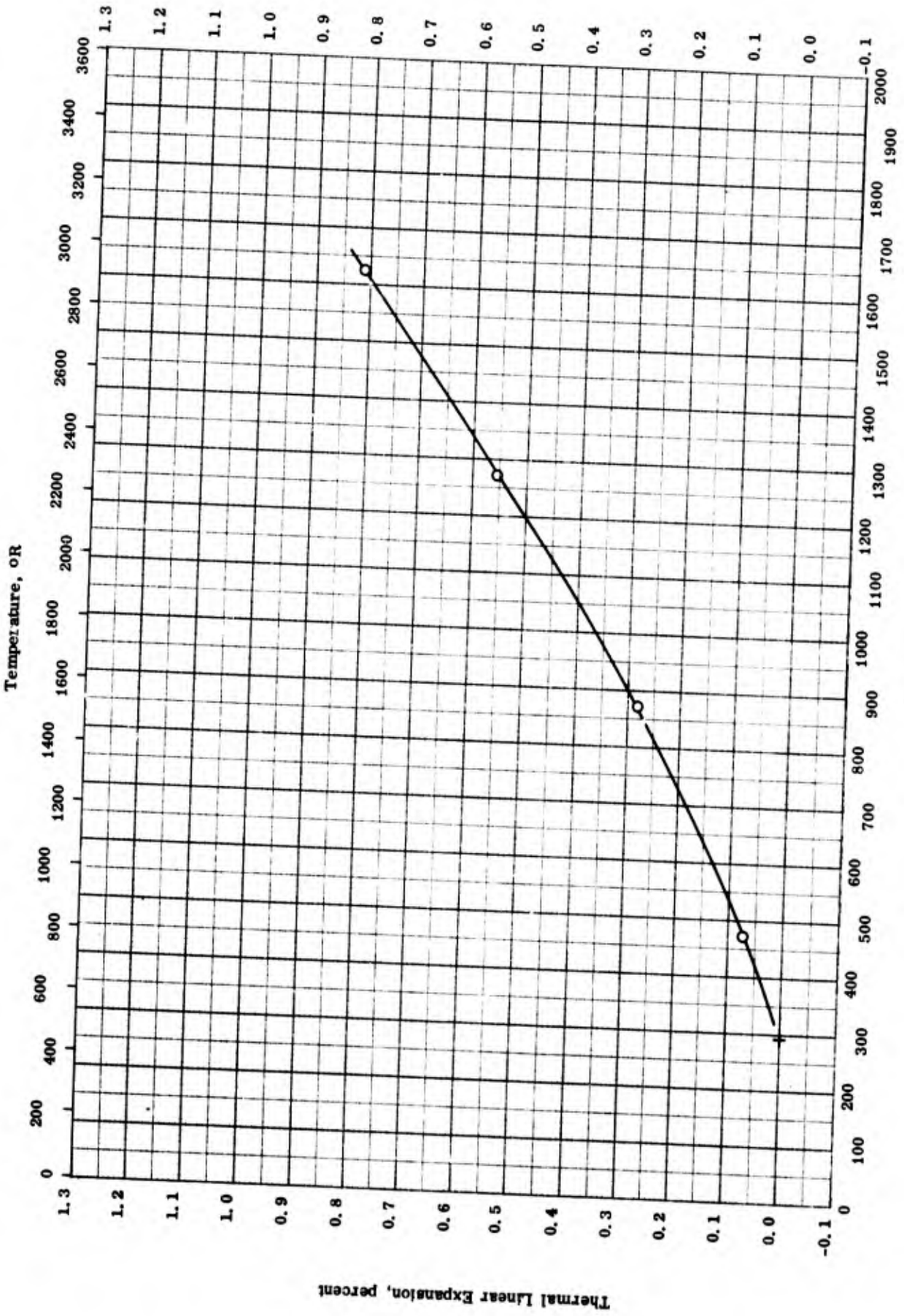


THERMAL CONDUCTIVITY -- ALUMINUM NITRIDE

THERMAL CONDUCTIVITY -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-5	473-1073		AlN; 64.8 Al, 32.8 N, 1.0 O, 0.4 Si, 0.2 C, and 0.1 Fe; particle size 0.5 to 25 μ; density 3.23 g cm^{-3} (approx. 100% theoretical value); chief impurity alumina.	Prepared by heating 1% sodium fluoride-mixed Al powder in purified nitrogen while temperature was raised rapidly to 650 C and then increased slowly over a period of 40 hrs to a max. of 1800 C; dry ball milled to a light gray powder.

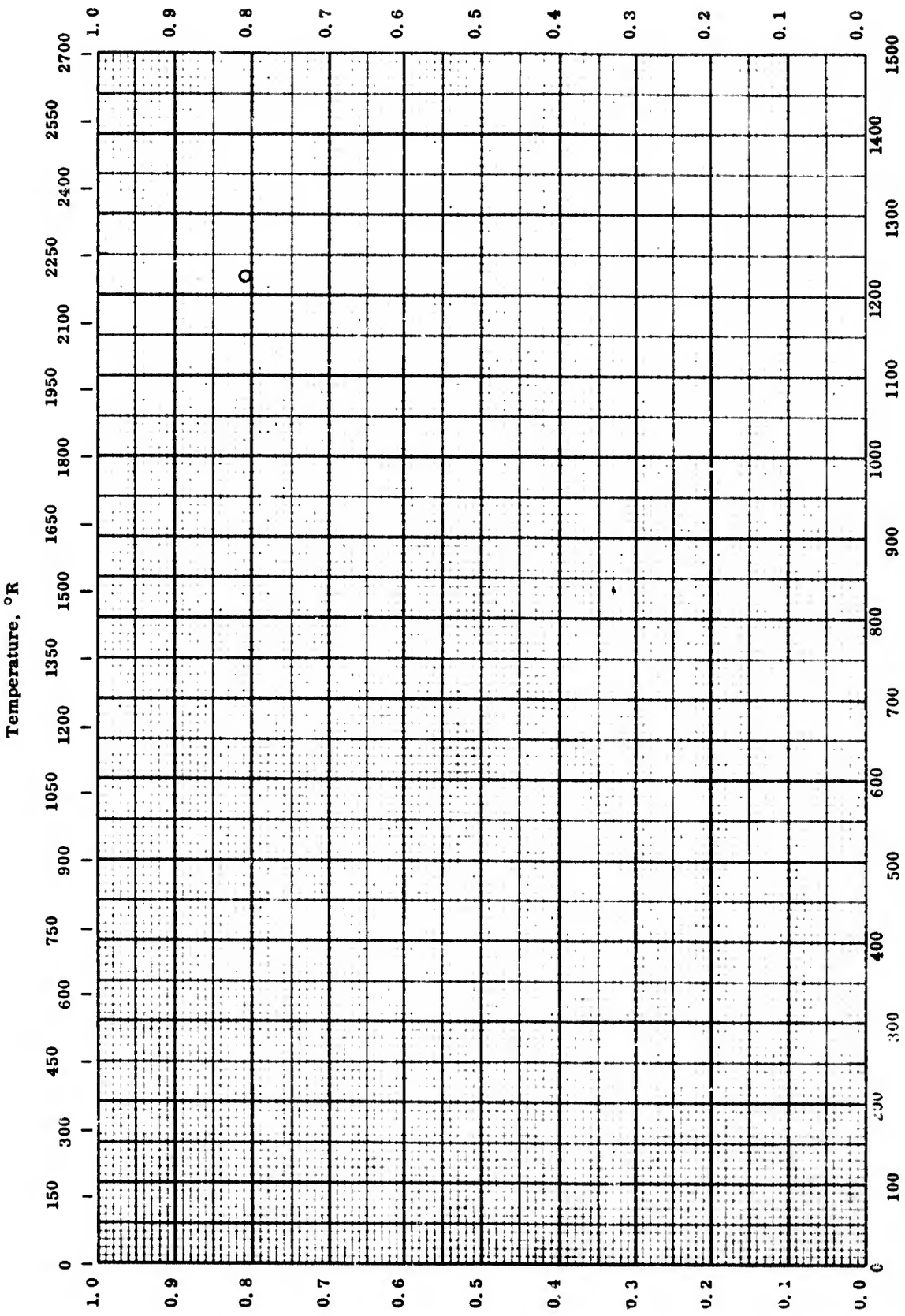


THERMAL LINEAR EXPANSION -- ALUMINUM NITRIDE

THERMAL LINEAR EXPANSION -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-5	298-1623		AlN; 64.8 Al, 32.8 N, 1.0 O, 0.4 Si, 0.2 C, and 0.1 Fe; calculated composition 96.0 AlN, 2.1 Al_2O_3, and 1.9 others; prepared from Alcoa's No. 101 atomized aluminum powder; bulk density 3.20 g cm^{-3}.	Prepared by direct combination of aluminum powder with 1% sodium fluoride, heated rapidly in purified nitrogen to 650 C, heated to max. of 1800 C over 40 hr period, dry ball milled to average particle size of approx. 5 μ, pressed into 3 in. diameter by 3 in. long rods at 5000 psi and 2000 C, cut into 0.5 in. diameter by 3 in. long rod, and ground; measured parallel to pressing direction.

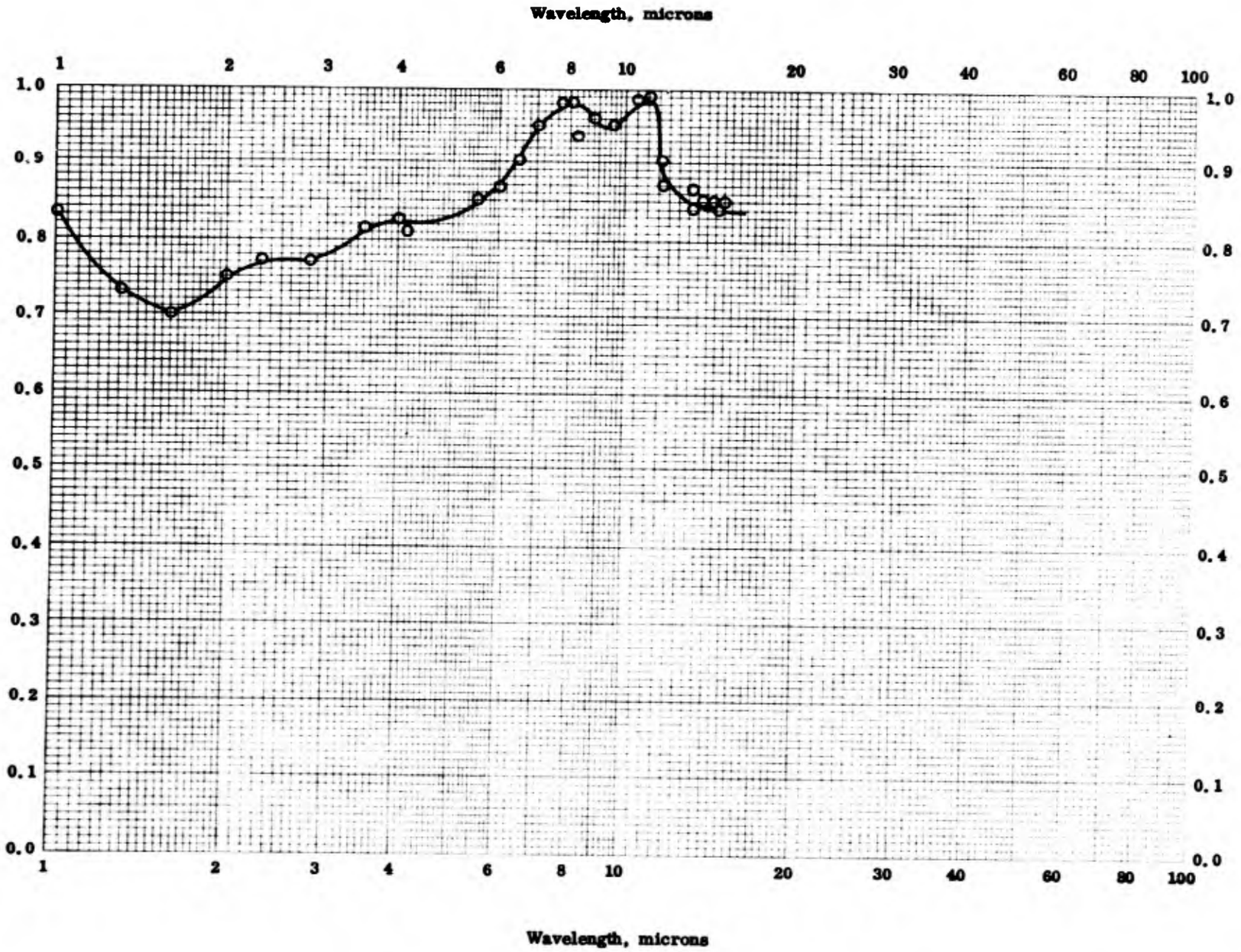


NORMAL TOTAL EMITTANCE -- ALUMINUM NITRIDE

NORMAL TOTAL EMITTANCE -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223		AlN from Carborundum Co.; density 2.04 g cm^{-3}, 0.07 in. thickness.	Measured in argon atmosphere; computed from spectral data.

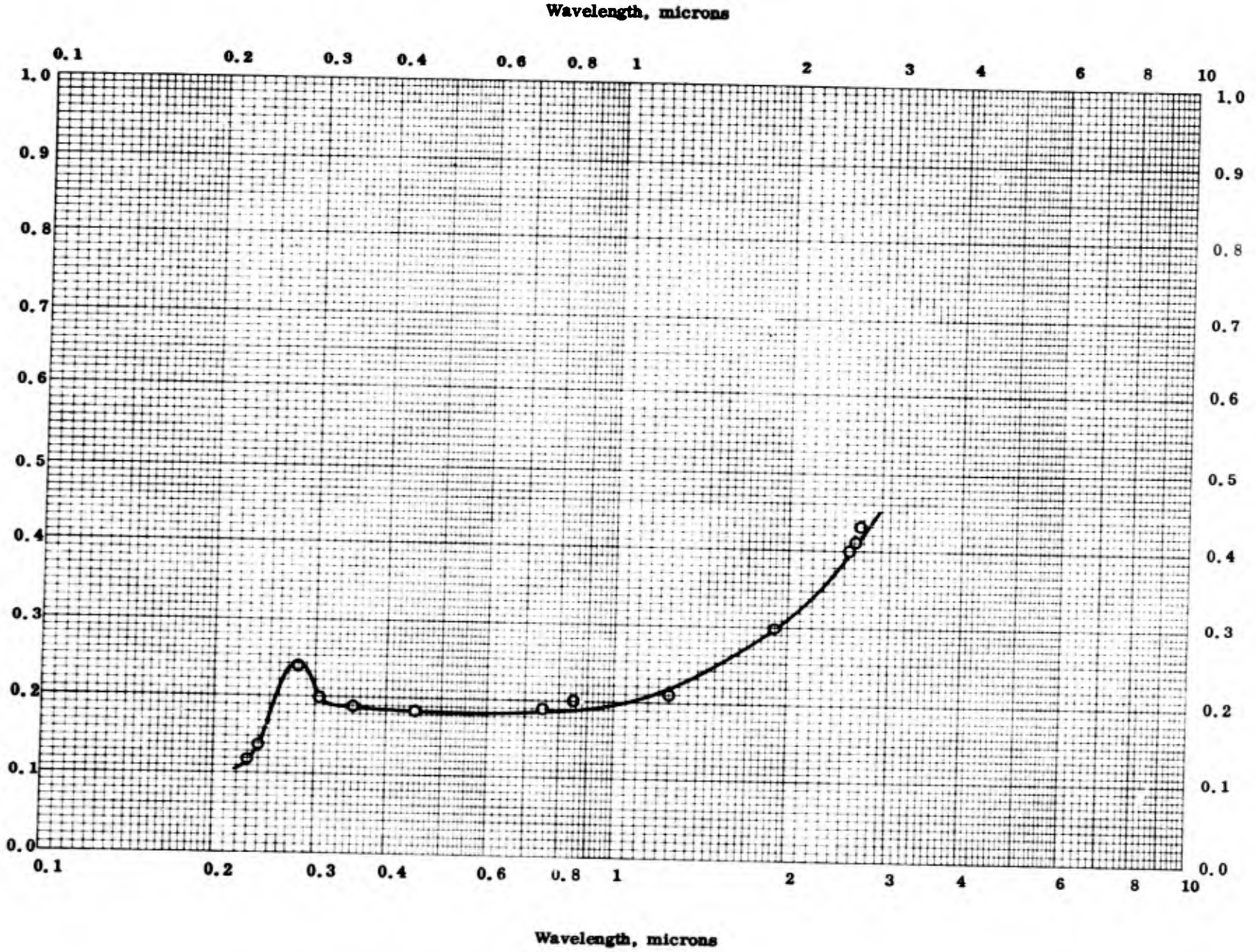


NORMAL SPECTRAL EMITTANCE -- ALUMINUM NITRIDE

NORMAL SPECTRAL EMITTANCE -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	1223	1-15		AlN from Carborundum Co.; density 2.04 g cm^{-3}; 0.07 in. thickness.	Measured in argon atmosphere; data taken from a curve.



NORMAL SPECTRAL REFLECTANCE -- ALUMINUM NITRIDE

NORMAL SPECTRAL REFLECTANCE -- ALUMINUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	AlN from Carborundum Co.; density 2.04 g cm^{-3}. 0.07 in. thickness.	Data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.

PROPERTIES OF BERYLLIUM NITRIDES

REPORTED VALUES

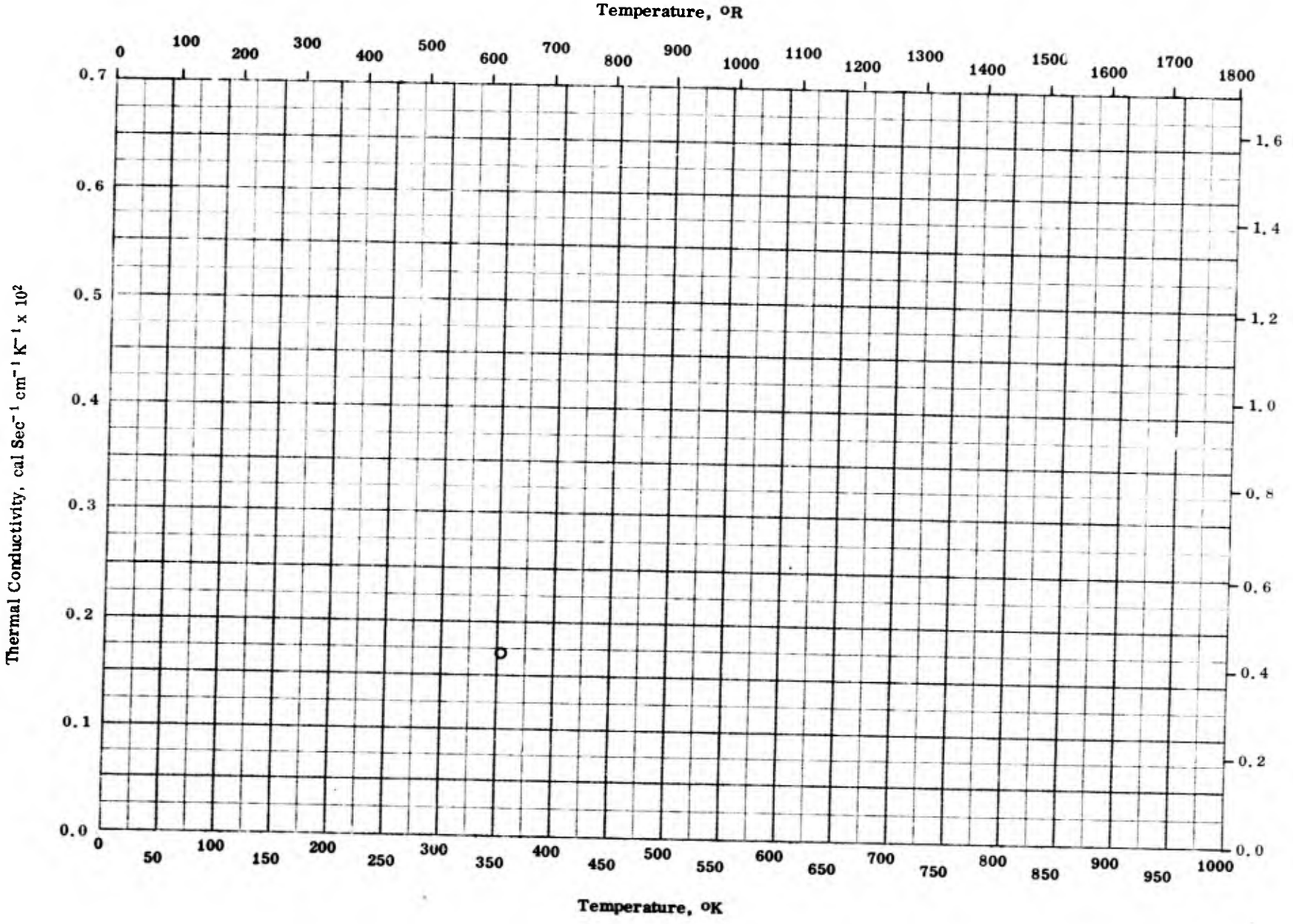
		K	R
Melting Point			
△	Be_3N_2	2473	4451
▽	Be_3N_4	2478*	4460*
◇	Be_3N_4	2473	4451
Heat of Fusion		cal g^{-1}	Btu lb^{-1}
○	Be_3N_2	561	991.8
Heat of Vaporization		cal g^{-1}	Btu lb^{-1}
□	Be_3N_2	5613	10103

*Most probable value for this compound.

PROPERTIES OF BERYLLIUM NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	298		Be_3N_2.	
□	61-21	298		Be_3N_2.	
△	58-10	2473		Be_3N_2.	
▽	58-10	2478		Be_3N_4.	
◇	60-28	2473		Be_3N_4.	



THERMAL CONDUCTIVITY -- BERYLLIUM NITRIDE

THERMAL CONDUCTIVITY -- BERYLLIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-4	353		Be_3N_2; density 106 lb ft^{-3}.	Pressed at 50, 000 psi.

PROPERTIES OF BORON NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.25*	140*
Melting Point	3273	5892
Heat of Vaporization . . .	2603	4685

*Handbook of Chemistry and Physics (Ref. 64-18)

REPORTED VALUES

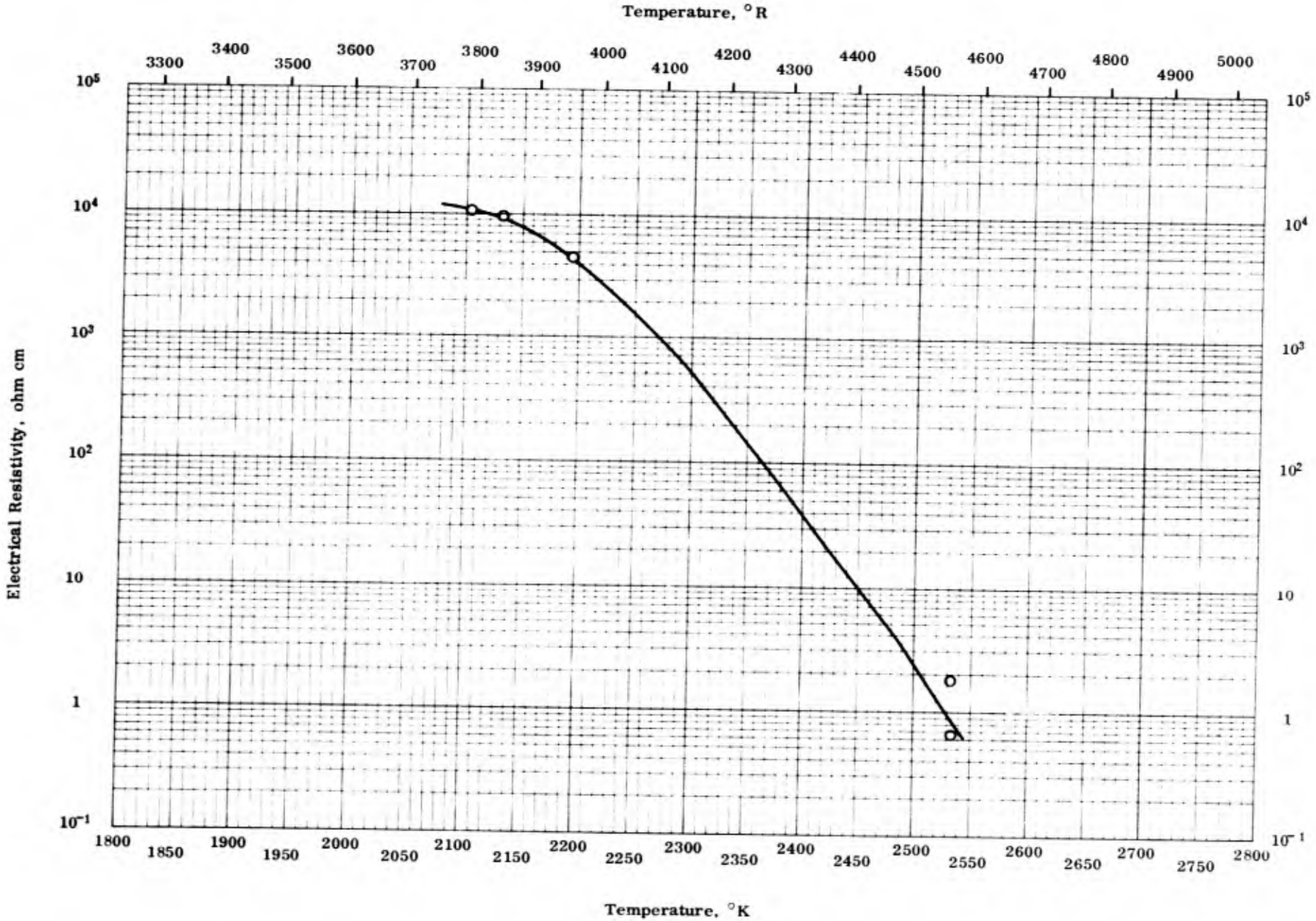
Melting Point		K	R
	□	3273	5892
	◇	3003	5405

Heat of Vaporization		cal g^{-1}	Btu lb^{-1}
	○	2603	4685

PROPERTIES OF BORON NITRIE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	298		BN	
□	62-46	3273		BN	
◇	57-22	3003		BN	



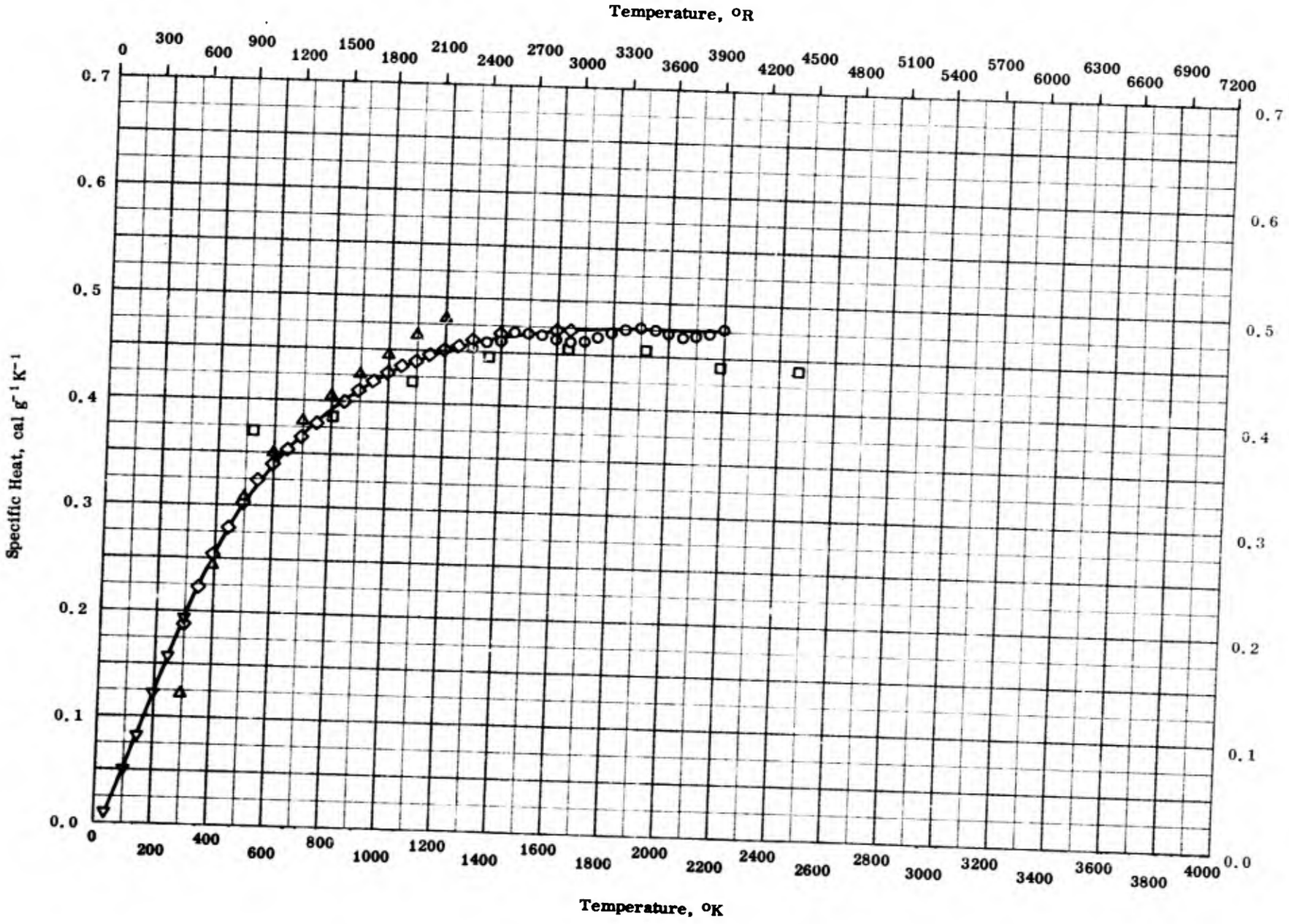
ELECTRICAL RESISTIVITY -- BORON NITRIDE

Electrical Resistivity, ohm cm

ELECTRICAL RESISTIVITY -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	2105-2533	2.4	BN; 43.9 B and 52.4 N.	Hot pressed; maximum exposure temperature 4100 F.

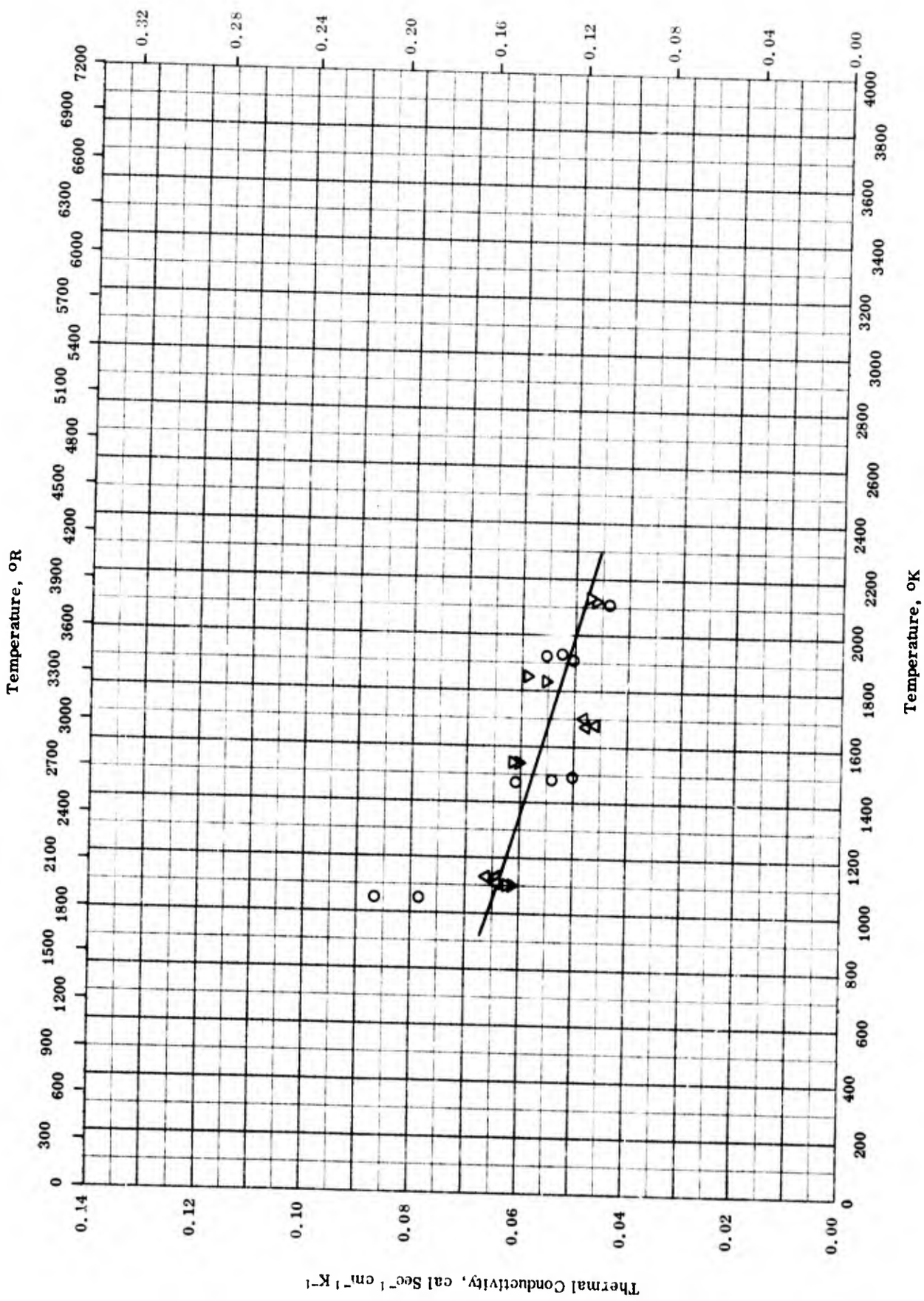


SPECIFIC HEAT -- BORON NITRIDE

SPECIFIC HEAT -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-20	1300-2200	≤5	98.0 BN and 1.7 BO.	Under argon atmosphere.
□	62-6	533-2477	≤5	BN; before test: 52.4 N_2, 42.9 B, 0.2 Ca, 0.2 Ti, and 0.1 Si; density 135 lb ft^{-3}; after test: 55.0 N_2, 41.5 B, and 0.13 C; density 135.5 lb ft^{-3}.	Hot pressed; crushed in hardened steel mortar to pass 100-mesh screen.
△	62-27	400-1200	0.5	BN; traces of impurities.	
◇	61-12	298-1689		BN; 56.85 N_2 and 42.81 B.	
▽	54-8	41-300		BN; 1.5 Fe as Fe_3O_4.	

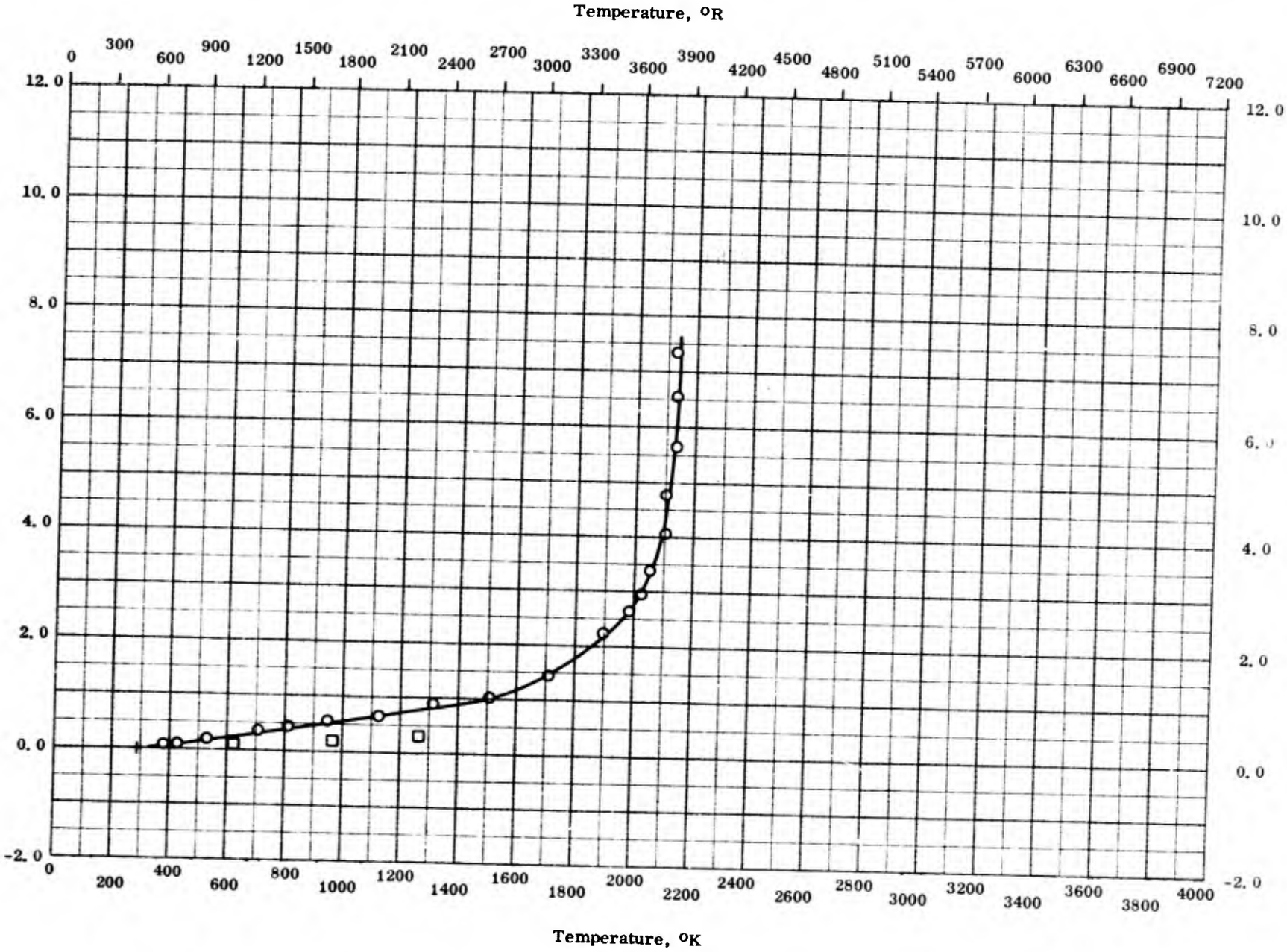


THERMAL CONDUCTIVITY -- BORON NITRIDE

THERMAL CONDUCTIVITY -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	62-6	1112-1697	5-7	BN.	Ground and polished thoroughly.
○	62-6	1047-2114	5-7	BN.	Second run of the above sample.
▽	62-6	1103-2129	5-7	BN.	Third run of the above sample.

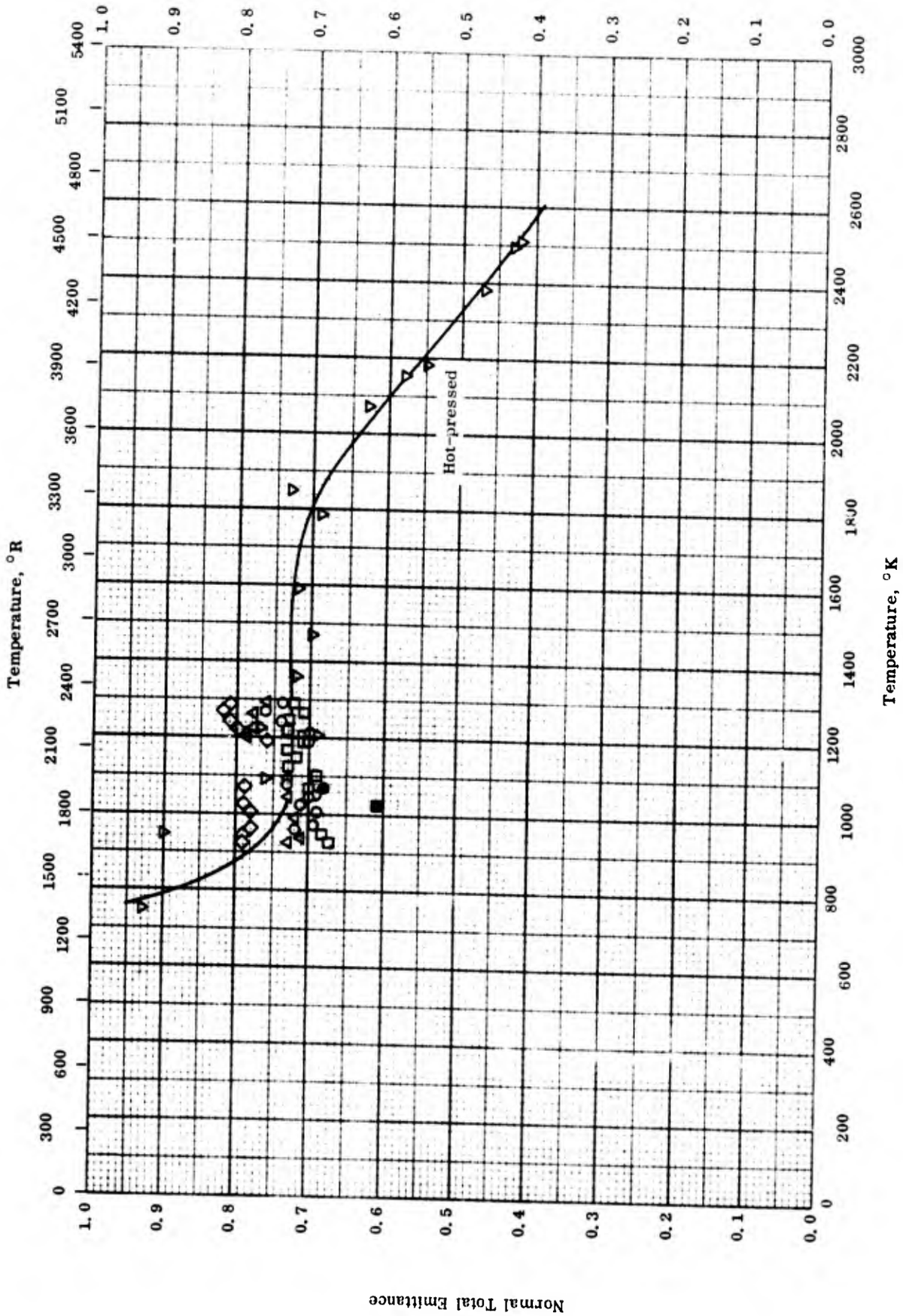


THERMAL LINEAR EXPANSION -- BORON NITRIDE

THERMAL LINEAR EXPANSION -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	294-2130	5	BN from Carborandum Co.; 42.9 B and 52.4 N; elements found by semi-quantitative emission spectrography before exposure 0.2 Ca, 0.2 Ti, and 0.1 Si; after exposure 41.5 B, 55.0 N, and 0.13 C; density in g cm^{-3} at 25 C by ASTM method B311-58 before exposure 2.14, after exposure 1.96; initial length 3.029 in., final length 3.251 in. [Author's design.: Run No. E11].	Hot pressed; sample cracked and distorted on post inspection; measured in helium atm.; photo micrographs taken after exposure revealed that the structures macrocracked and phases changed in size and distribution.
□	55-6	293-1273		BN; density 107 lb ft^{-3}.	

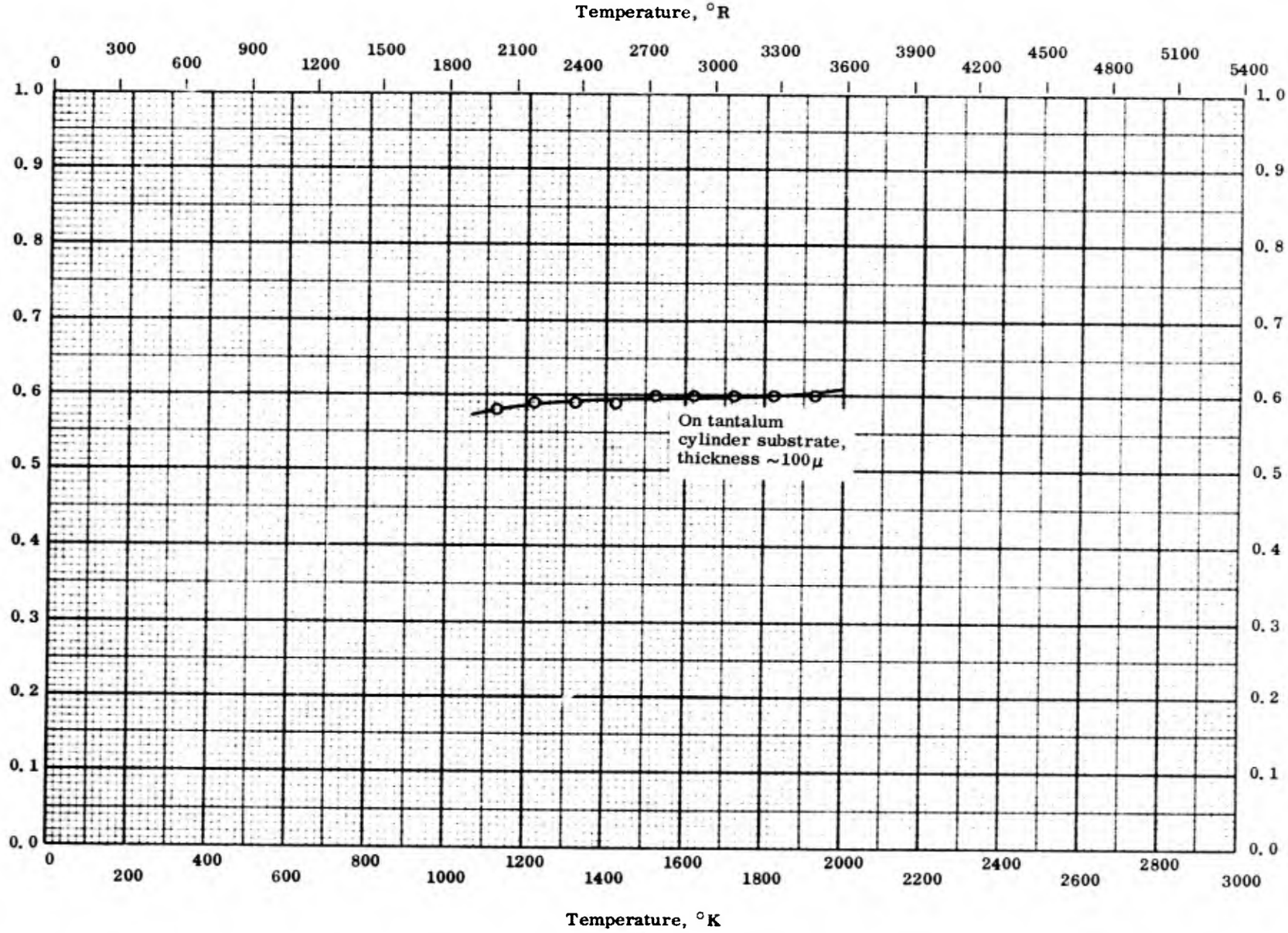


NORMAL TOTAL EMITTANCE -- BORON NITRIDE

NORMAL TOTAL EMITTANCE -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-29	961-1297		BN; 0.023 in. thickness.	Pressed; polished by emery paper to a uniform surface and dried at 373 K.
□	62-29	936-1299		BN; 0.029 in. thickness.	Same as above.
△	62-29	928-1297		BN; 0.072 in. thickness.	Same as above.
◇	62-29	929-1289		BN; 0.253 in. thickness.	Same as above.
▽	62-6	752-2500		BN; density 2.16 g cm^{-3}.	Hot-pressed; measured in dry argon atmosphere.
●	63-18	1273	±8	97 pure BN from Carborundum Co.; density 2.09 g cm^{-3}, 0.05 in. thickness.	Measured in argon atmosphere; computed from spectral data.
■	63-18	1223	±8	99.5 pure BN; density 2.0 g cm^{-3}, 0.065 in. thickness.	Sintered at 2123 K for 2 hrs; same as above.

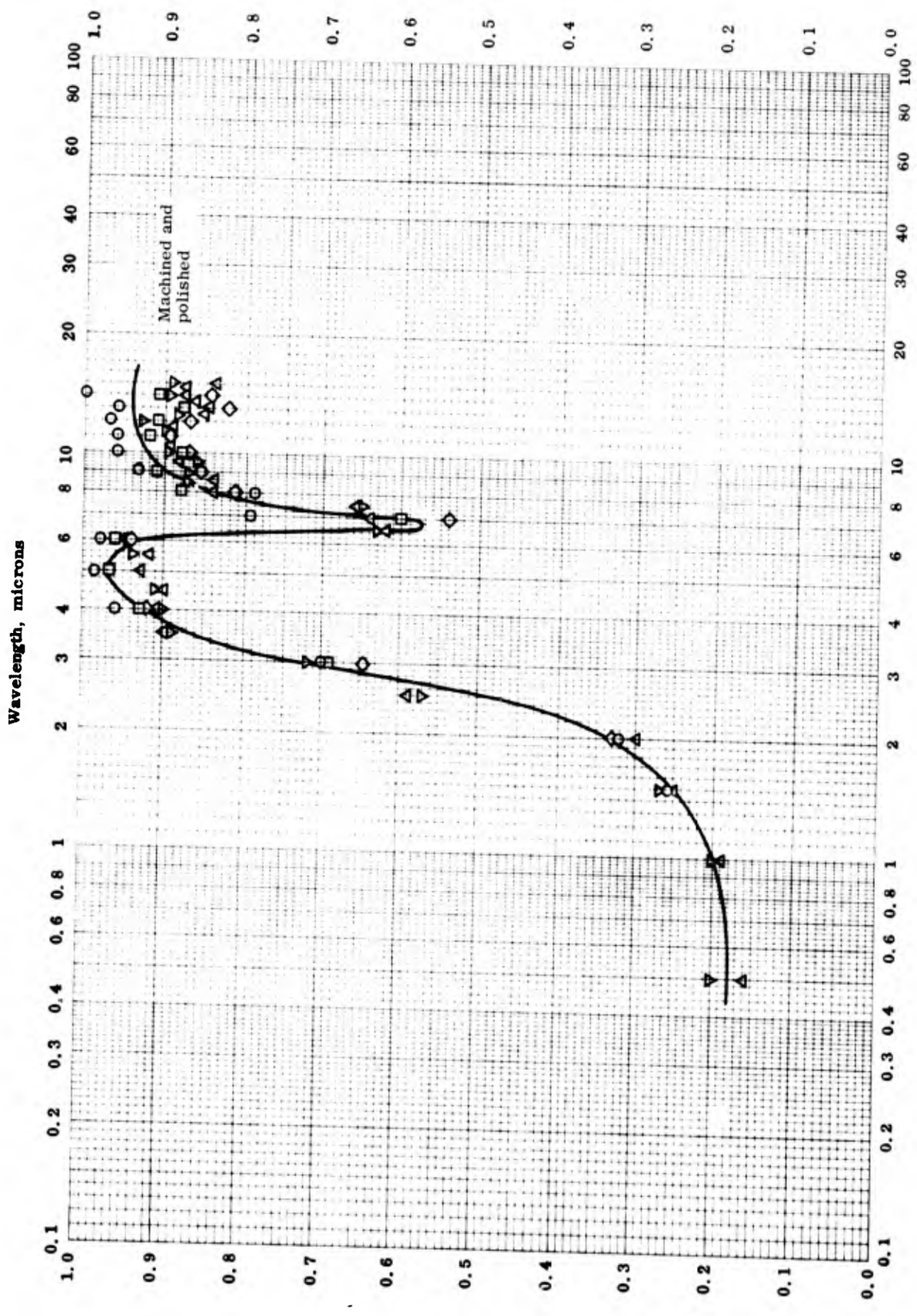


NORMAL SPECTRAL EMITTANCE -- BORON NITRIDE

NORMAL SPECTRAL EMITTANCE -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Wavelength μ	Temp. Range °K	Rept. Error%	Sample Specifications	Remarks
O	60-12	0.65	1123-1923		BN layer of paste on tantalum cylinder.	Prepared from powder suspended in nitrate binder, approximately 100μ thickness and dried at 320 K.

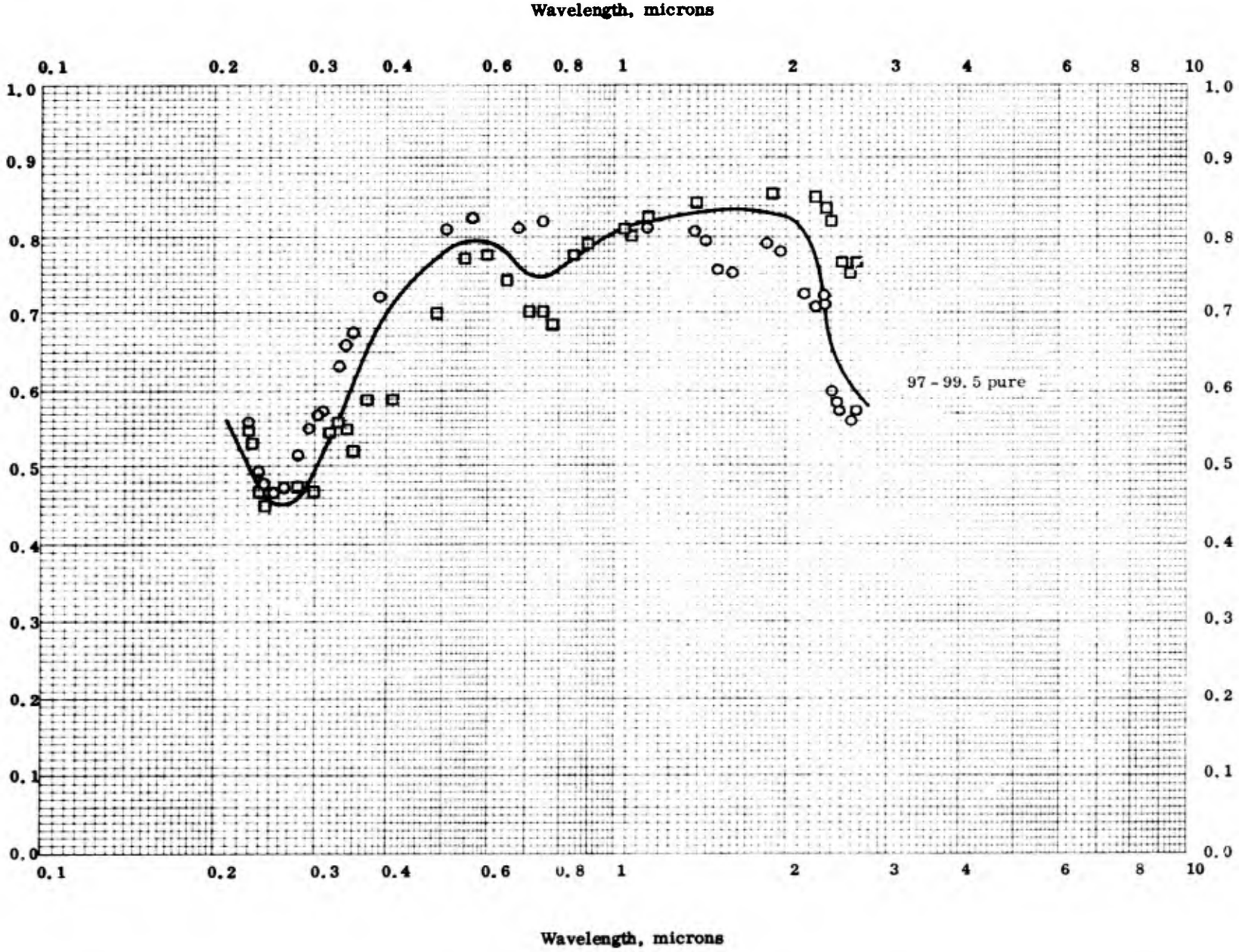


NORMAL SPECTRAL EMITTANCE -- BORON NITRIDE

NORMAL SPECTRAL EMITTANCE -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	60-15	1353	1.5-14	±4	BN.	Ultrasonically machined, diamond wheel finish; measured in air.
□	60-15	1083	2-14	±4	Same as above.	Same as above.
◇	60-15	873	2-14	±4	Same as above.	Same as above.
△	62-29	1033	0.5-15		BN, first cycle.	Polished.
▽	62-29	1033	0.5-15		Same as above, second cycle.	Same as above.



NORMAL SPECTRAL REFLECTANCE -- BORON NITRIDE

NORMAL SPECTRAL REFLECTANCE -- BORON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	97 pure BN from Carborundum Co.; density 2.09 g cm^{-3}; 0.05 in. thickness.	Data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
□	63-18	298	0.23-2.65	5	99.5 pure BN; density 2.0 g cm^{-3}; 0.065 in. thickness.	Sintered at 2123 K for 2 hrs; same as above.

PROPERTIES OF HAFNIUM NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	10.85	677
Melting Point	3583	6450

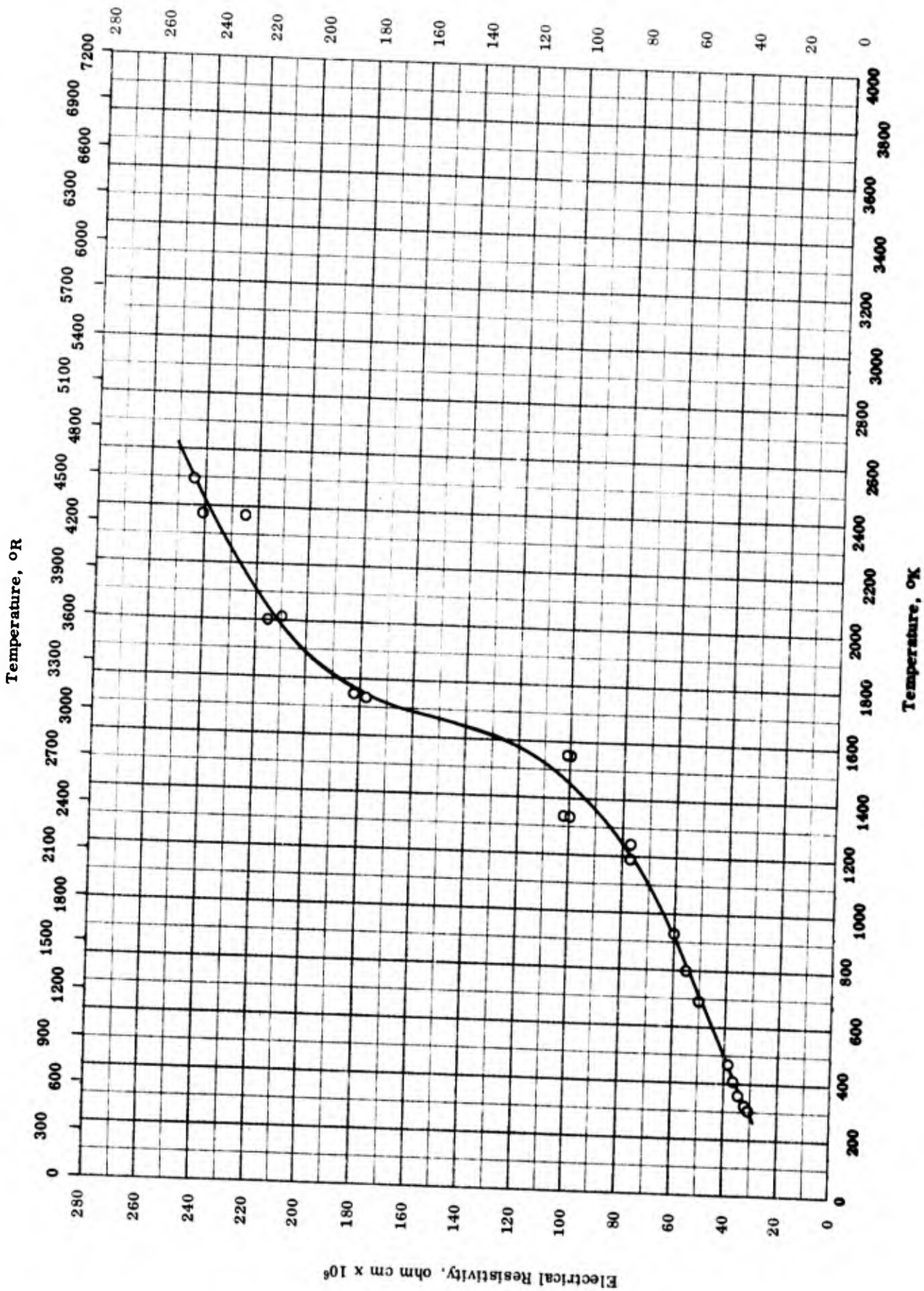
REPORTED VALUES

		g cm^{-3}	lb ft^{-3}
Density			
	○	10.85	677
		K	R
Melting Point			
	□	3255	5859
	△	3583	6450

PROPERTIES OF HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-5	298		Wet analysis: 95.4 Hf, 6.61 N, 0.9 O.	Hot pressed (firing temp. near 6500 F); max. exposure temp. 4750 F.
□	51-8	3255		HfN.	
△	60-8	3583		HfN.	

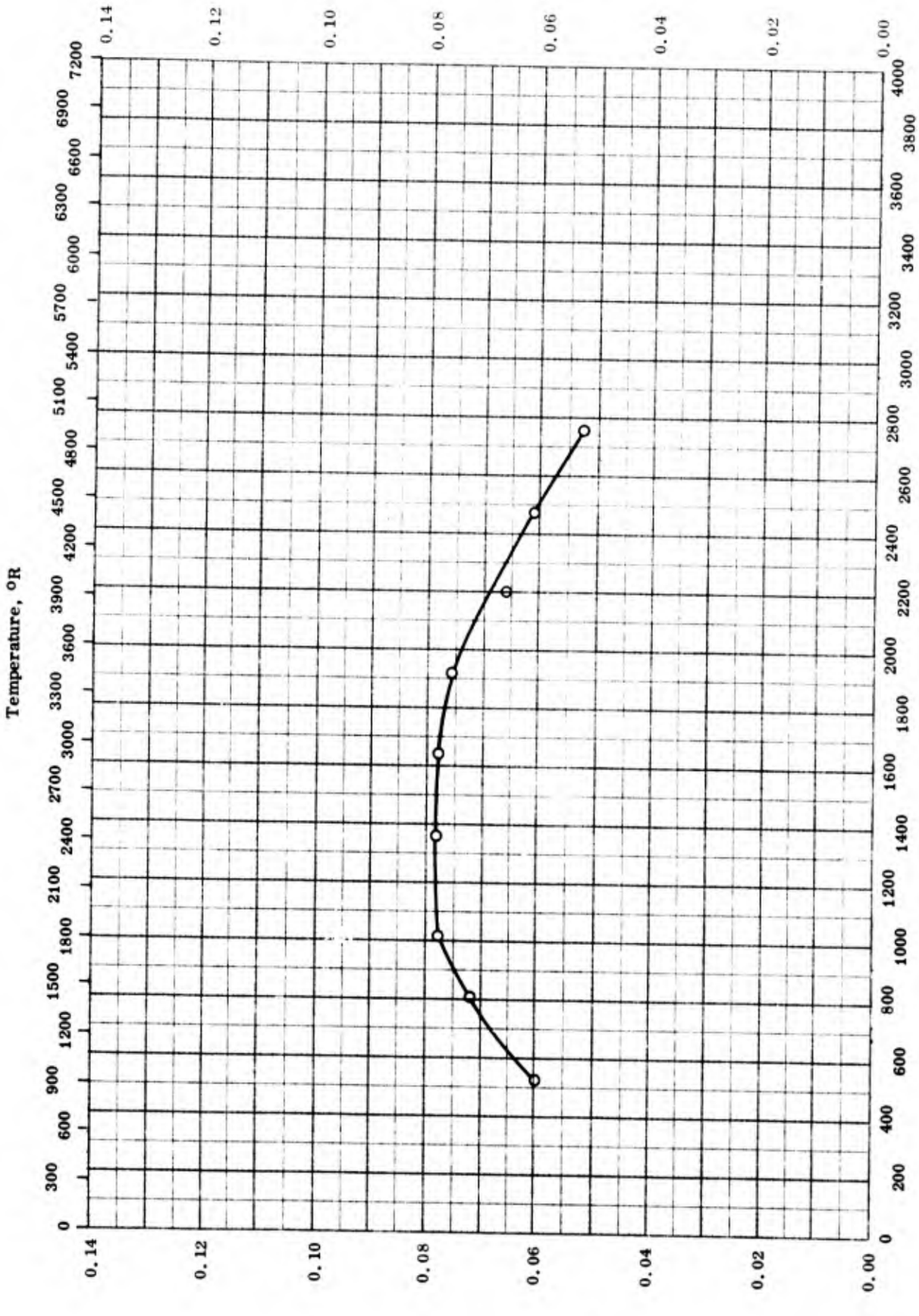


ELECTRICAL RESISTIVITY -- HAFNIUM NITRIDE

ELECTRICAL RESISTIVITY -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	305-2489	2.4	Hf N; 93.6 Hf and 7.5 N	Hot pressed; maximum exposure temperature 4750 F

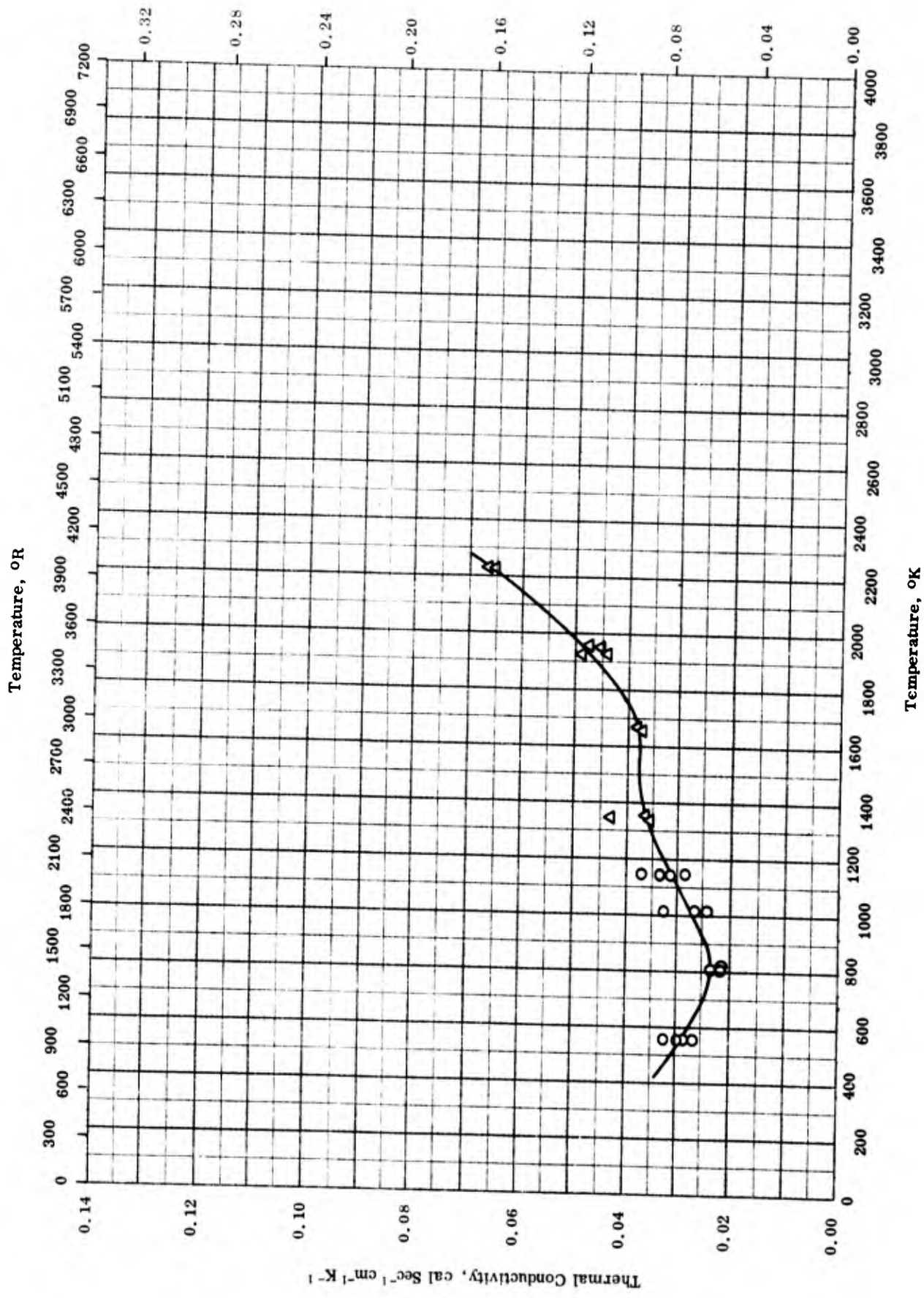


SPECIFIC HEAT -- HAFNIUM NITRIDE

SPECIFIC HEAT -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-5	533-2755	≤5	HfN; 95.4 Hf, 6.61 N_2 and 0.9 O_2; density 677 lb ft^{-3}.	Hot pressed.

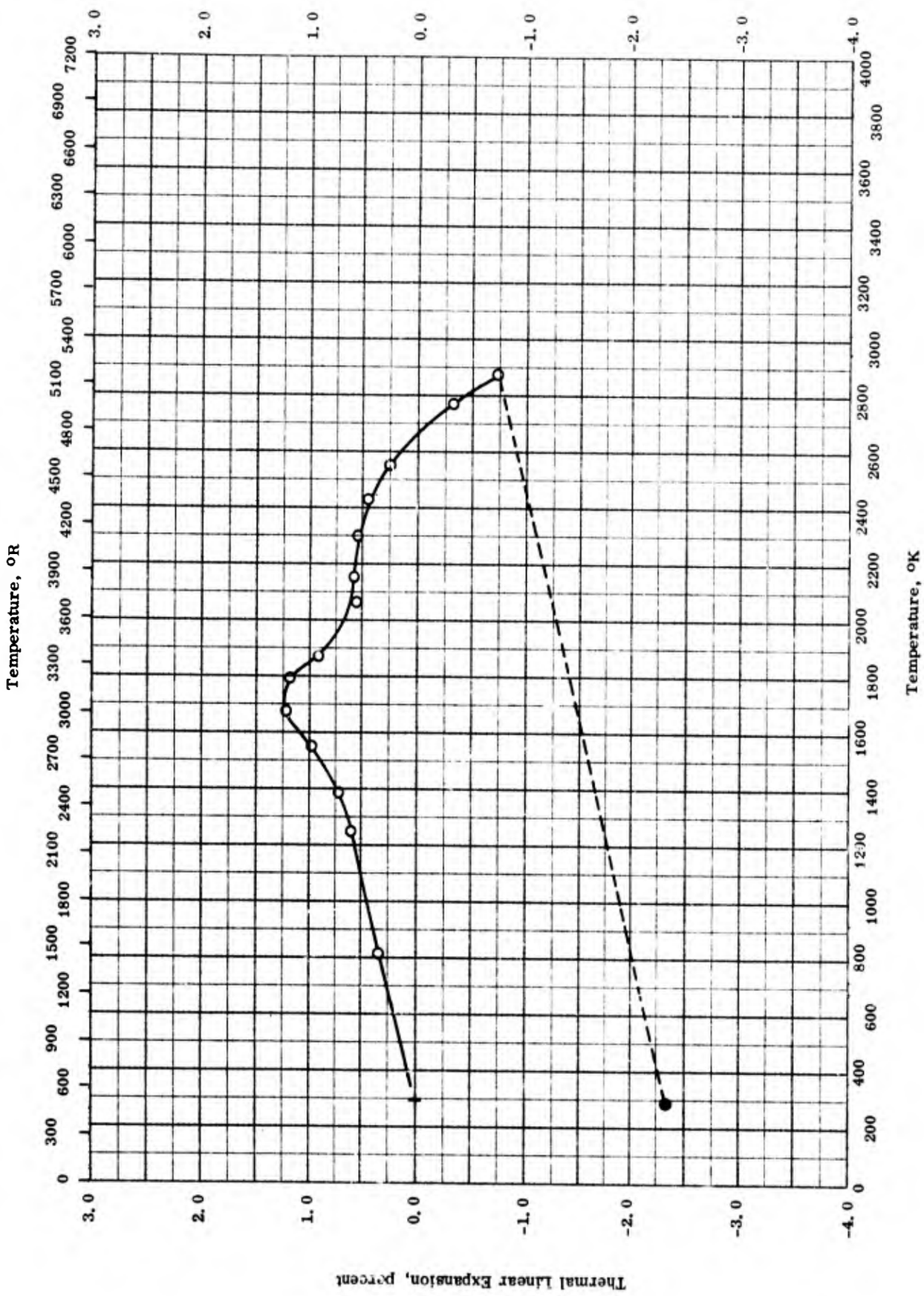


THERMAL CONDUCTIVITY -- HAFNIUM NITRIDE

THERMAL CONDUCTIVITY -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-5	557-1149	2-4	HfN; 95.4 Hf, 6.61 N_2, and 0.9 O_2; composition by wet analysis; density 677 lb ft^{-3}.	Hot-pressed and fired at near 6500 F.
Δ	62-5	1336-2232	2-4	Same as above.	Same as above; sample found fractured after measurements.

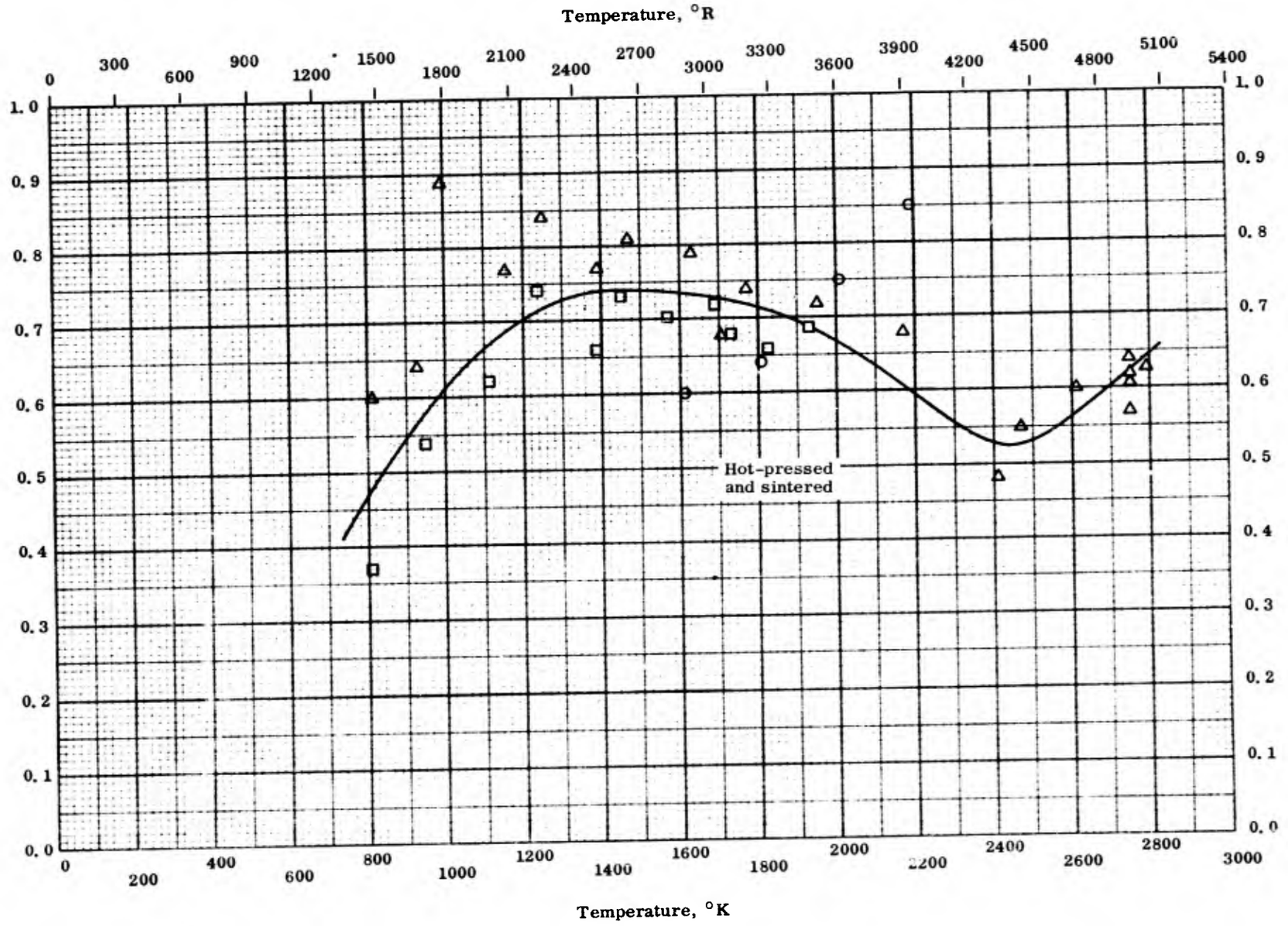


THERMAL LINEAR EXPANSION -- HAFNIUM NITRIDE

THERMAL LINEAR EXPANSION -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	294-2872	2	HfN, Carborundum Co.; before exposure 93.6 Hf, 7.5 N, elements found by semi-quantitative emission spectrography 0.2 Mg, 0.3 Ca, and 3.4 Zr; after exposure 93.6 Hf, 7.5 N, and 0.07 C; density in g cm^{-3} at 25 C by ASTM method B311-58 before exposure 12.7, after exposure 12.4; initial length 3.0015 in. [Author's design.: Run SRI-E29].	Hot pressed and fired near 6500 F; measured in helium atmosphere; photomicrographs taken after exposure revealed that the structures macrocracked and phases changed in size and distribution.
●	62-5	294-2872	2	Same as above; final length 2.9400 in.	Cooling cycle for above sample; sample broken on post inspection.

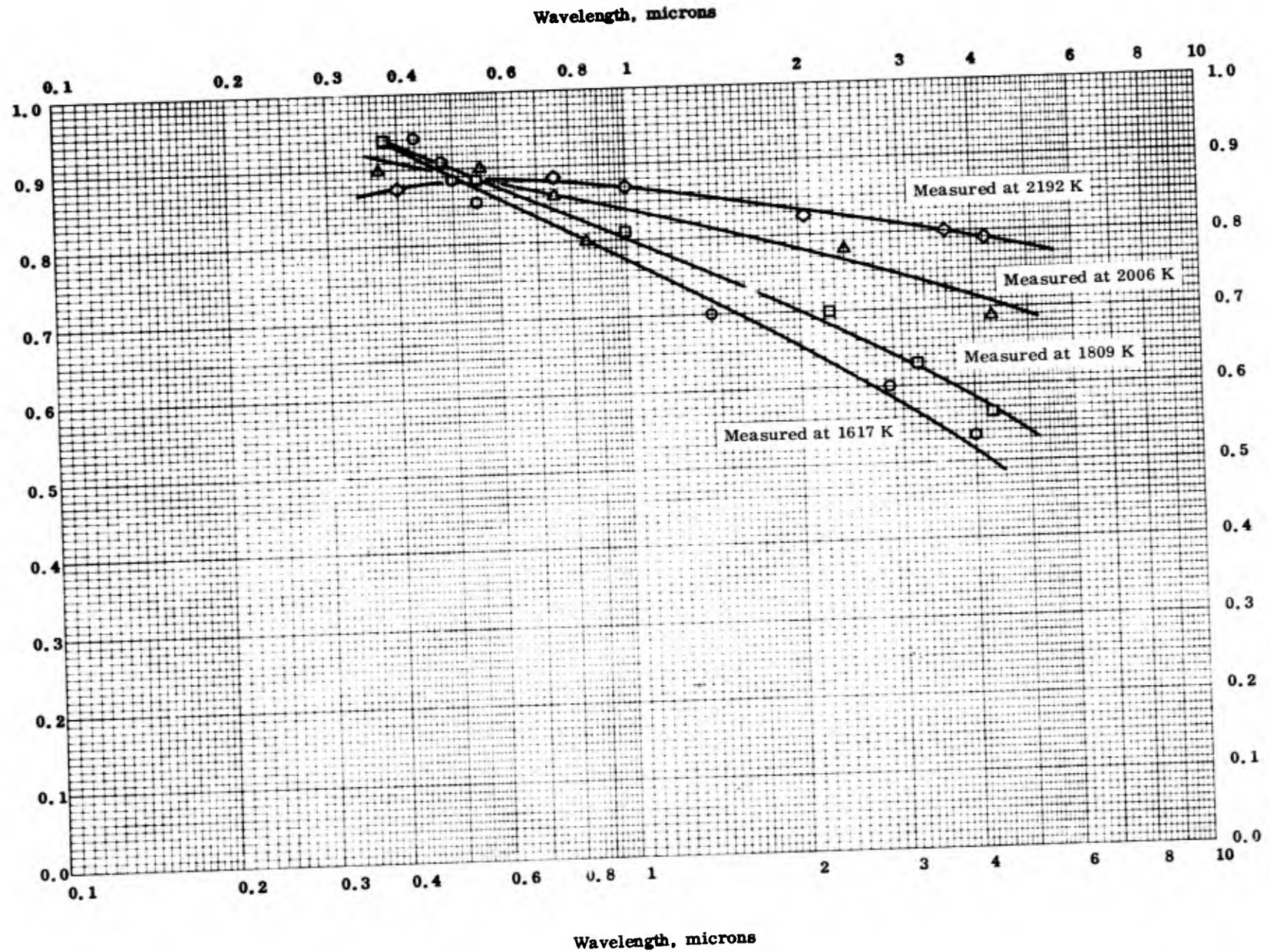


NORMAL TOTAL EMITTANCE -- HAFNIUM NITRIDE

NORMAL TOTAL EMITTANCE -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-1	1617-2192		HfN; from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in argon atmosphere (2.0 atm); computed from spectral data.
□	62-6	808-1933	10	HfN; density 12.8 g cm^{-3}.	Hot-pressed; measured in argon atmosphere.
△	62-6	819-2744	10	Same as above.	Run No. 2 of the above sample.

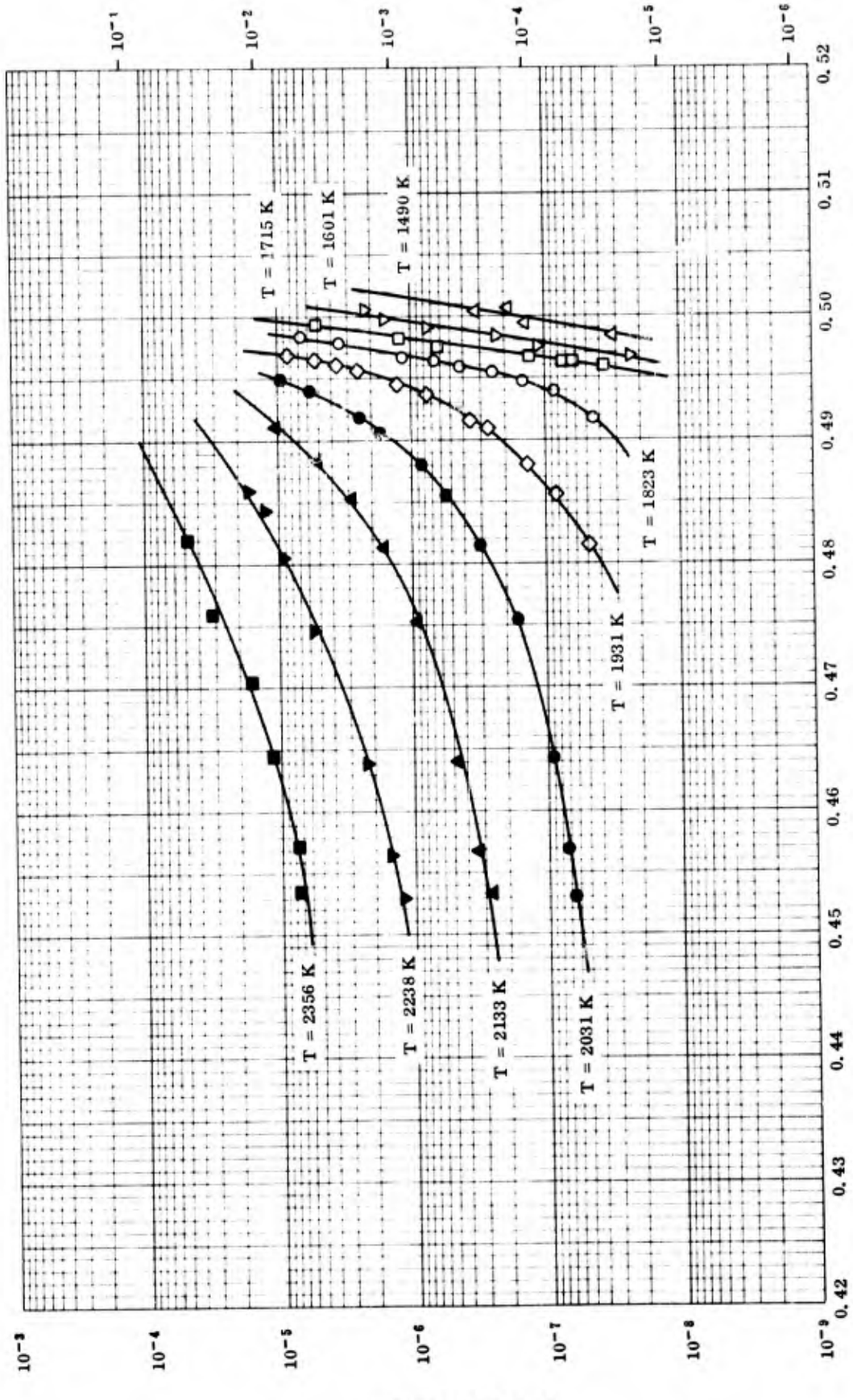


NORMAL SPECTRAL EMITTANCE -- HAFNIUM NITRIDE

NORMAL SPECTRAL EMITTANCE -- HAFNIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	64-1	1617	0.43-4.0		HfN; from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in argon atmosphere (1.5 - 2.0 atm).
□	64-1	1809	0.38-4.3		Same as above.	Same as above.
△	64-1	2006	0.37-4.3		Same as above.	Same as above.
◇	64-1	2192	0.40-4.2		Same as above.	Same as above.

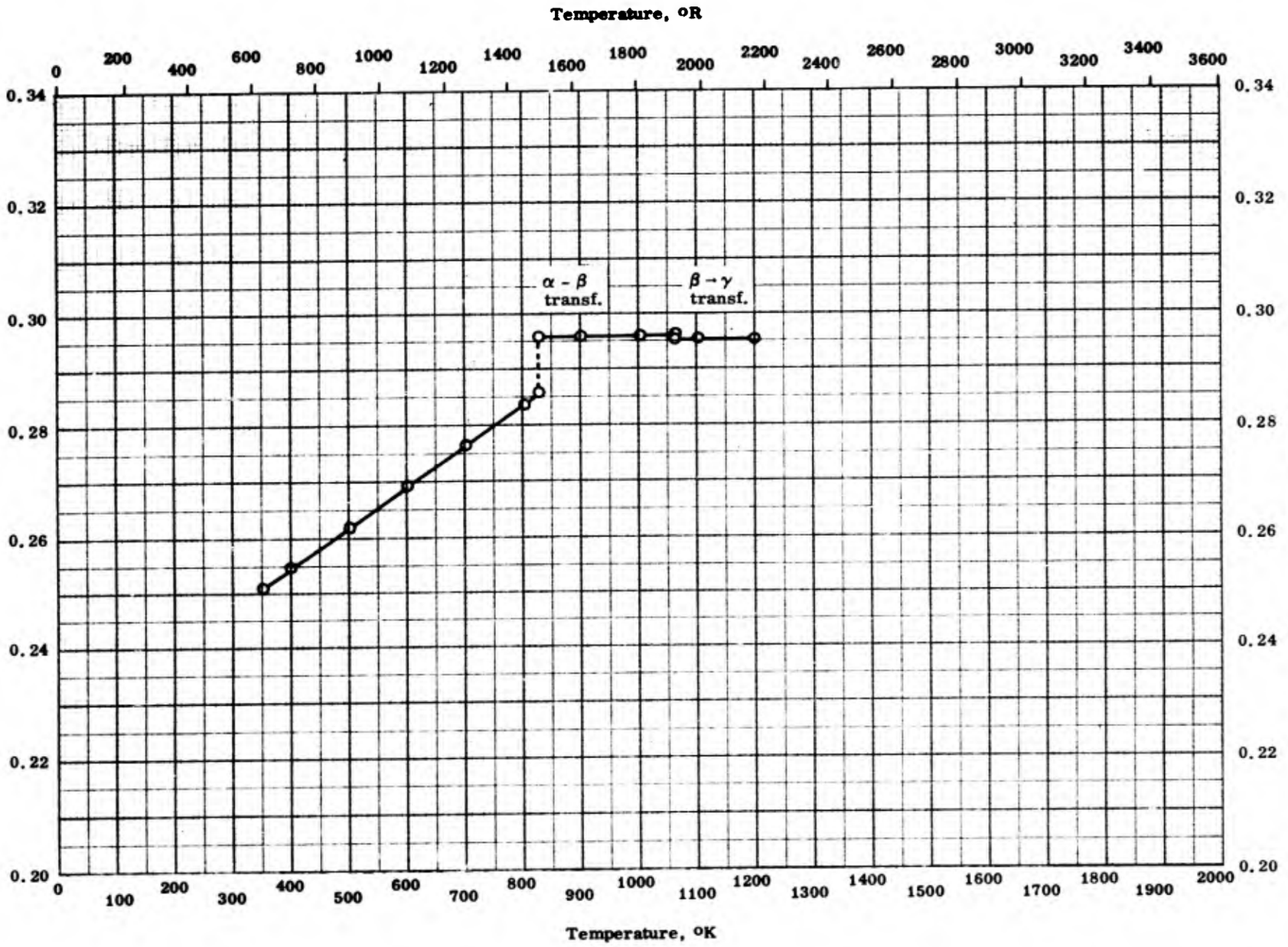


VAPOR PRESSURE -- HAFNIUM NITRIDE
(As a function of N in HfN)

VAPOR PRESSURE -- HAFNIUM NITRIDE
(As a function of N in HfN)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	64-1	1490		7.37 N, 1.05 Zr, 0.031 O, 0.0024 H, and trace of Fe, Mg, Ti; prepared by USAEC reactor grade HfN.	Heated under purified nitrogen for 6-1/2 hrs at 1500 C; gas phase nitrogen.
▽	64-1	1601		Same as above.	Same as above.
□	64-1	1715		Same as above.	Same as above.
○	64-1	1823		Same as above.	Same as above.
◇	64-1	1931		Same as above.	Same as above.
●	64-1	2031		Same as above.	Same as above.
▲	64-1	2133		Same as above.	Same as above.
▼	64-1	2238		Same as above.	Same as above.
■	64-1	2356		Same as above.	Same as above.



SPECIFIC HEAT -- MAGNESIUM NITRIDE

SPECIFIC HEAT -- MAGNESIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	49-5	350-1200		99.1 Mg_3N_2 and 0.90 MgO.	

PROPERTIES OF NIOBIUM NITRIDES

REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
	NbN	8.4*	524*
Melting Point:		K	R
○	NbN	2323	4182
□	NbN	2573**	4631**
△	Nb_2N	2693	4847

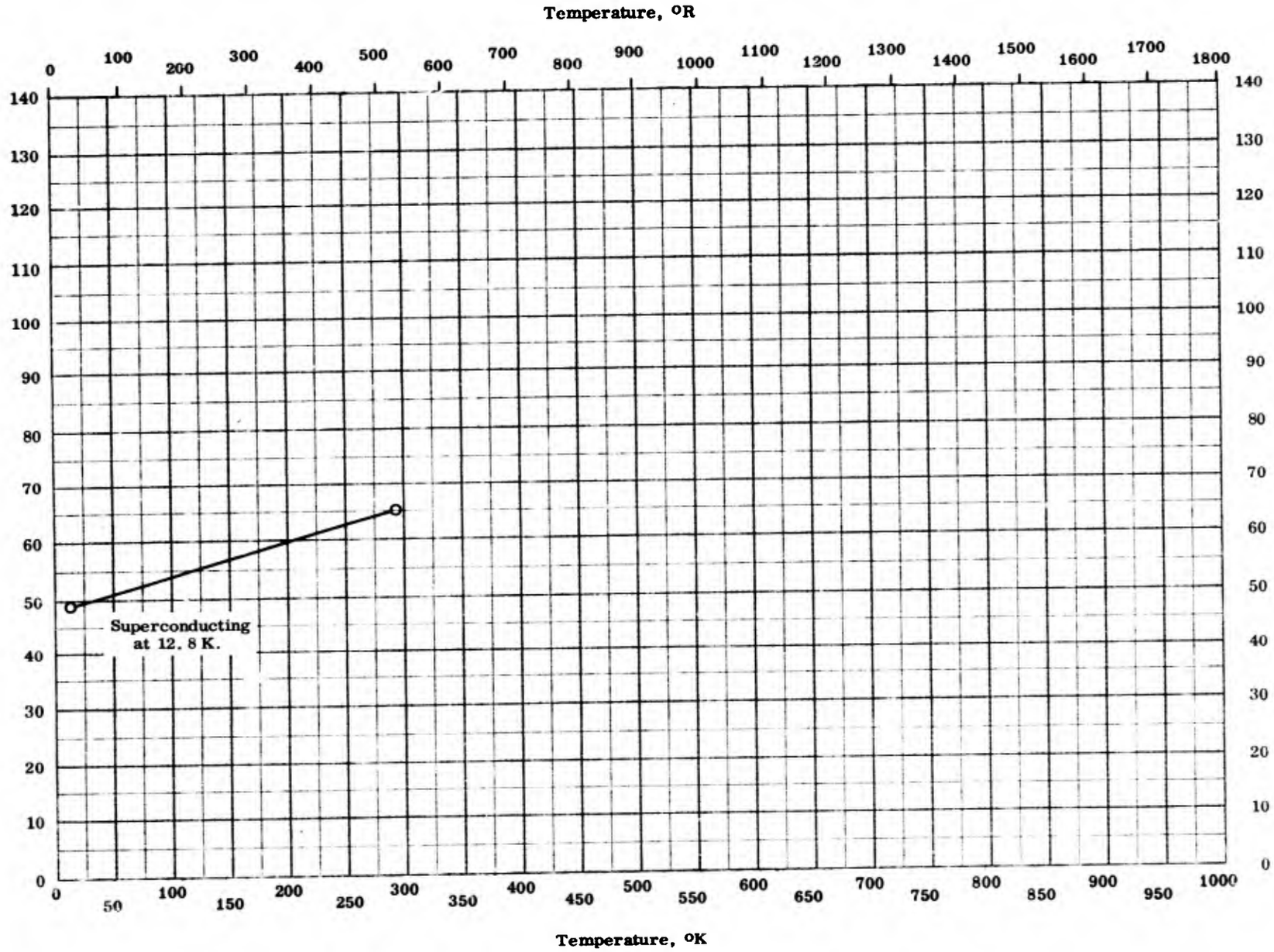
*Handbook of Chemistry and Physics (Ref. 64-18)

**Most probable value for this compound.

PROPERTIES OF NIOBIUM NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	2323		NbN.	
□	50-9	2573		NbN.	
△	62-48	2693		Nb_2N.	

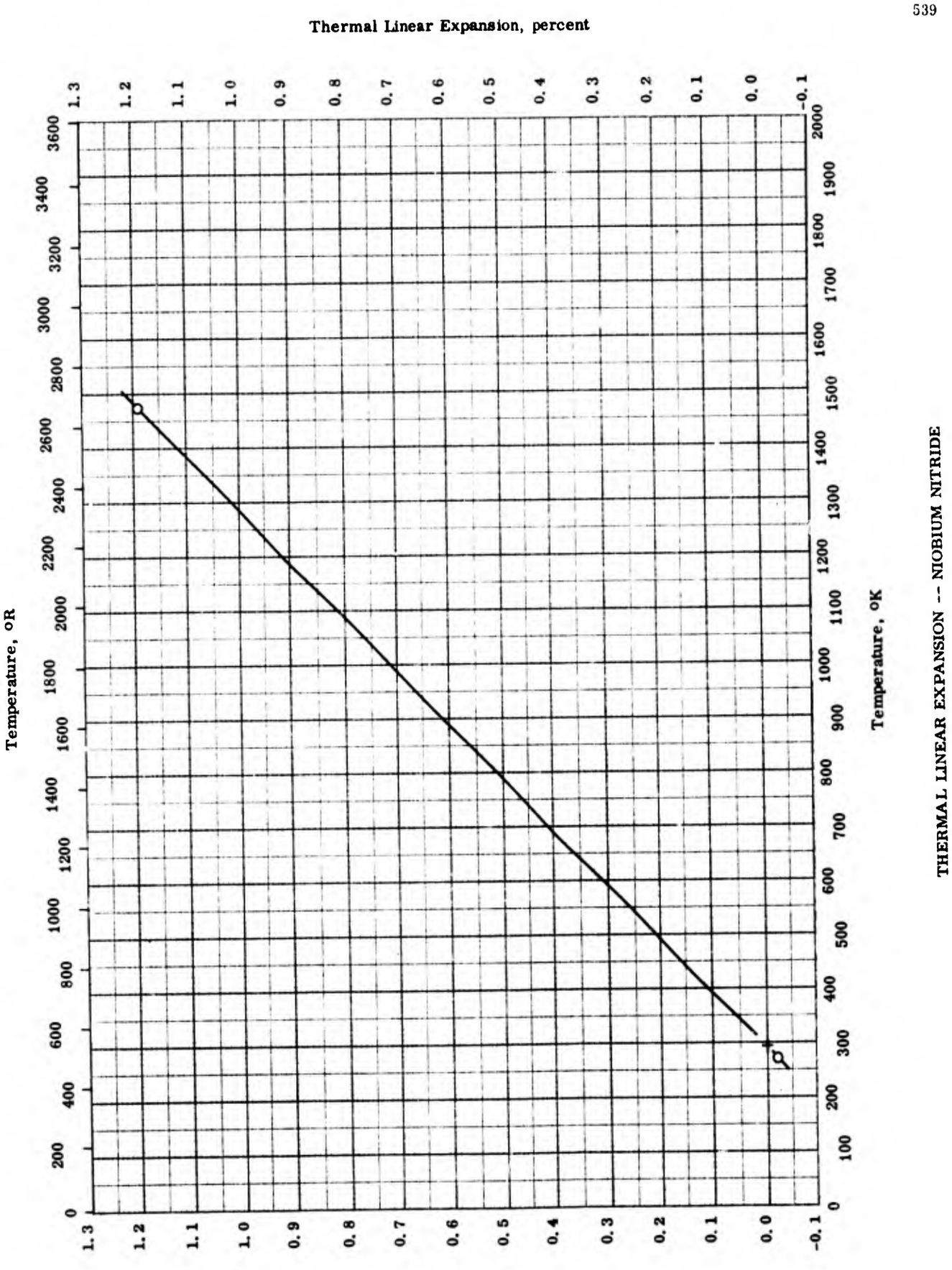


ELECTRICAL RESISTIVITY -- NIOBIUM NITRIDE

ELECTRICAL RESISTIVITY -- NIOBIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	52-3	13-293		NbN; 44.6 N; prepared from 99.9 Nb with 0.01 C traces of Fe, Sn, Ti, Zr, and Ta; wire of 0.25 mm dia.	Held at red heat in N_2.

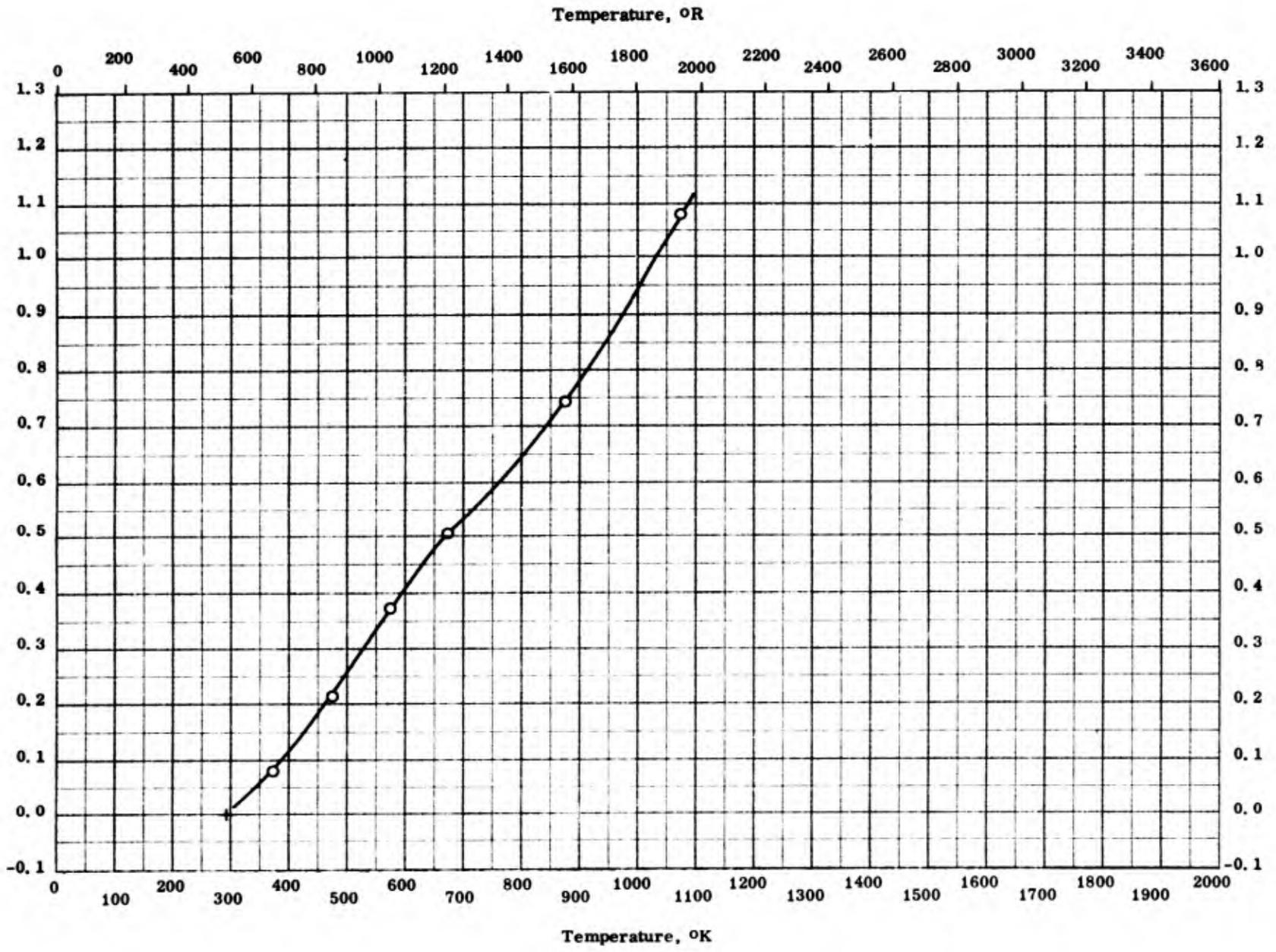


THERMAL LINEAR EXPANSION -- NIOBIUM NITRIDE

THERMAL LINEAR EXPANSION -- NIOBIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-36	273-1473		NbN; zero porosity.	



THERMAL LINEAR EXPANSION -- PLUTONIUM NITRIDE

THERMAL LINEAR EXPANSION -- PLUTONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-40	299-1073		X-ray diffraction analysis showed a single-phase PuN.	Synthesized by decomposing -325 mesh plutonium hydride in vacuum at 600 C and immediately passing gettered nitrogen at 1 atm over the highly active plutonium; error in lattice parameter measurement ±0.0010 Å, author assumed temperature error to be ±5 C; measured in vacuum with x-ray diffractometer.

PROPERTIES OF SILICON NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.37	148
Melting Point	2228	4010

REPORTED VALUES

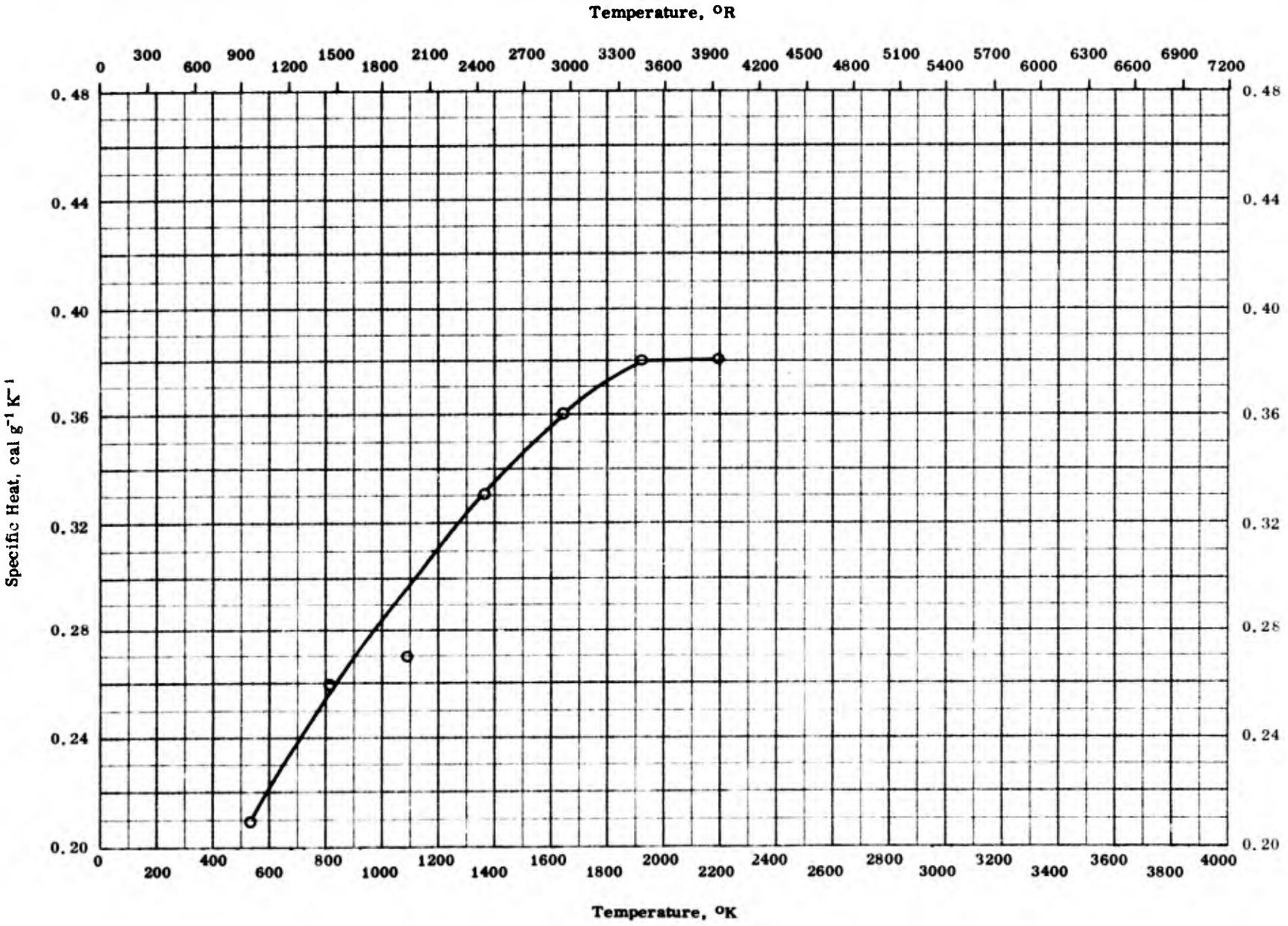
		Density: $g\ cm^{-3}$	Density: $lb\ ft^{-3}$
	○	2.37	148

		Melting Point: K	Melting Point: R
	□	2228	4010
	△	2173	3911

PROPERTIES OF SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	298		Si_3N_4; 0.05 Ca, 0.01 Cu, 0.01 Mg, 0.3 Al, 1.5 Fe, 0.01 Ti, and trace of Ba, Na, and Mn.	"A Casting Method";max. exposure temp. 3420 F
□	62-46	2228		Si_3N_4.	
△	58-10	2173		Si_3N_4.	

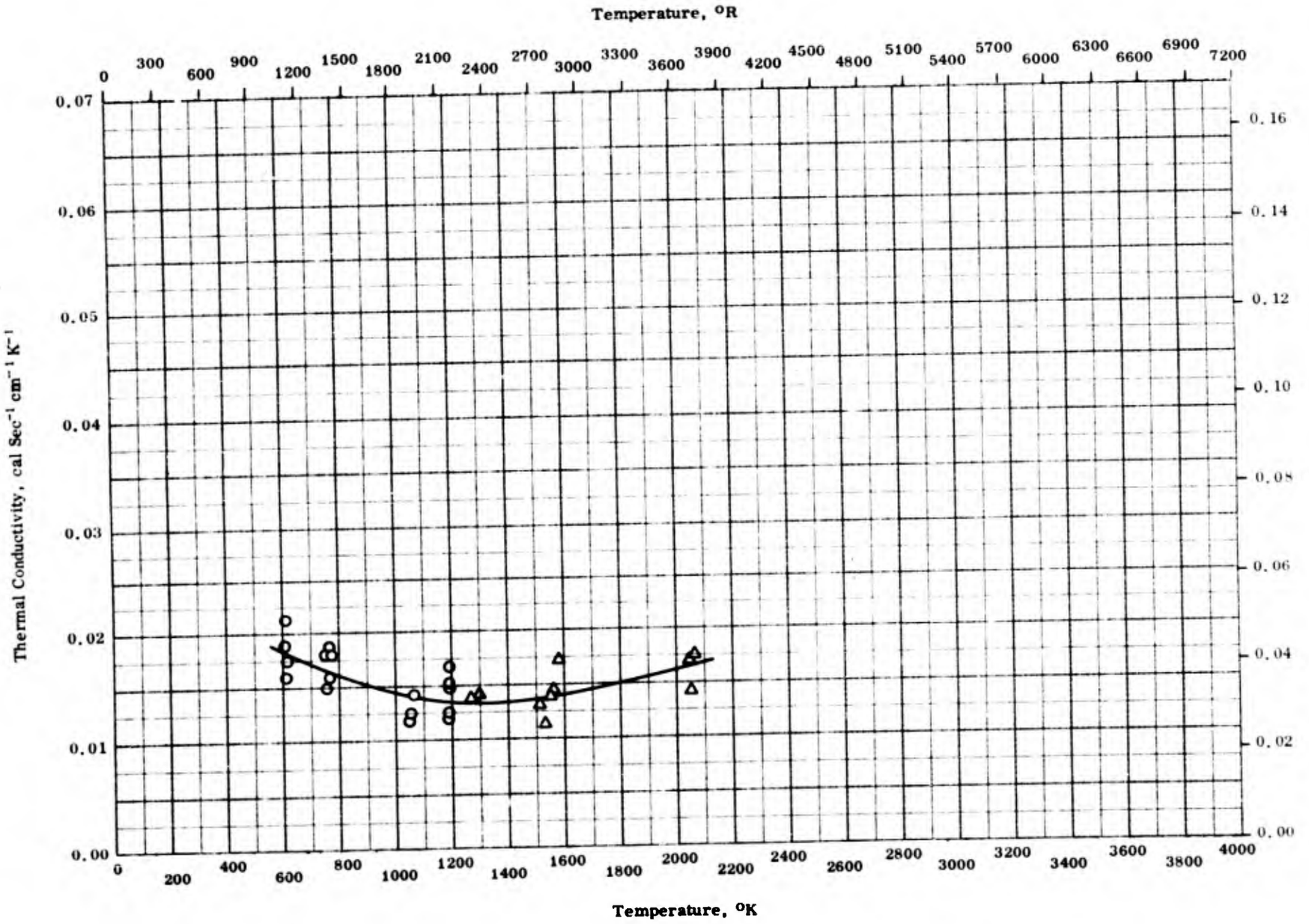


SPECIFIC HEAT -- SILICON NITRIDE

SPECIFIC HEAT -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-5	533-2200	≤50	98.17 Si_3N_4, 1.5 Fe, 0.3 Al, 0.05 Ca, 0.01 Cu, 0.01 Mg, 0.01 Ti, and traces Ba, Mn and Na; density 148 lb ft^{-3}.	

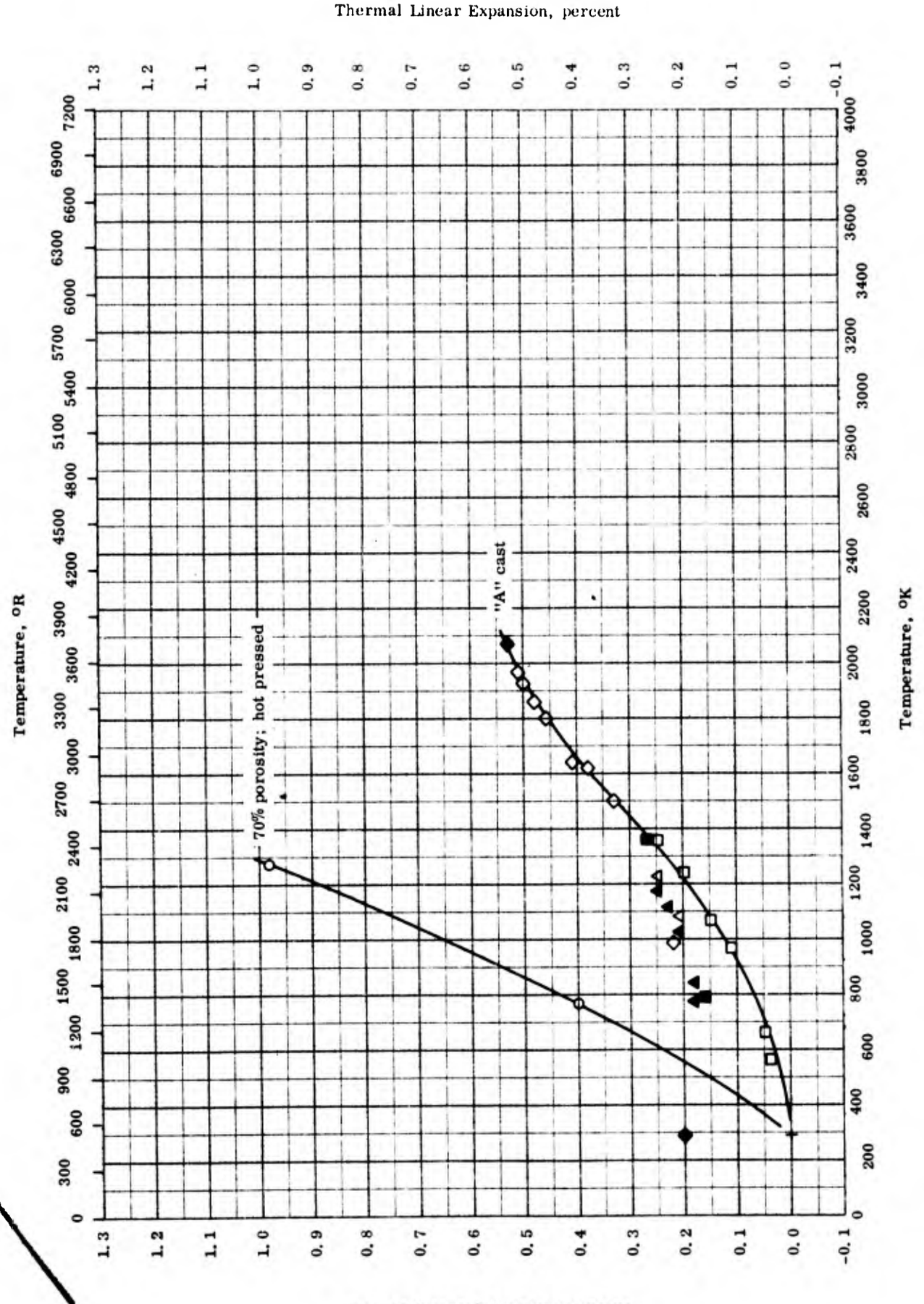


THERMAL CONDUCTIVITY -- SILICON NITRIDE

THERMAL CONDUCTIVITY -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-5	630-1195	2.5	Si_3N_4; 1.5 Fe, 0.3 Al, 0.05 Ca, 0.01 Cu, 0.01 Mg, 0.01 Ti, and traces of Ba, Na, and Mn; density 148 lb ft^{-3}.	Formed by using "A Casting Method"; maximum exposure temperature 3420 F.
Δ	62-5	1267-2061	2.5	Same as above.	Same as above; sample found melting after test.

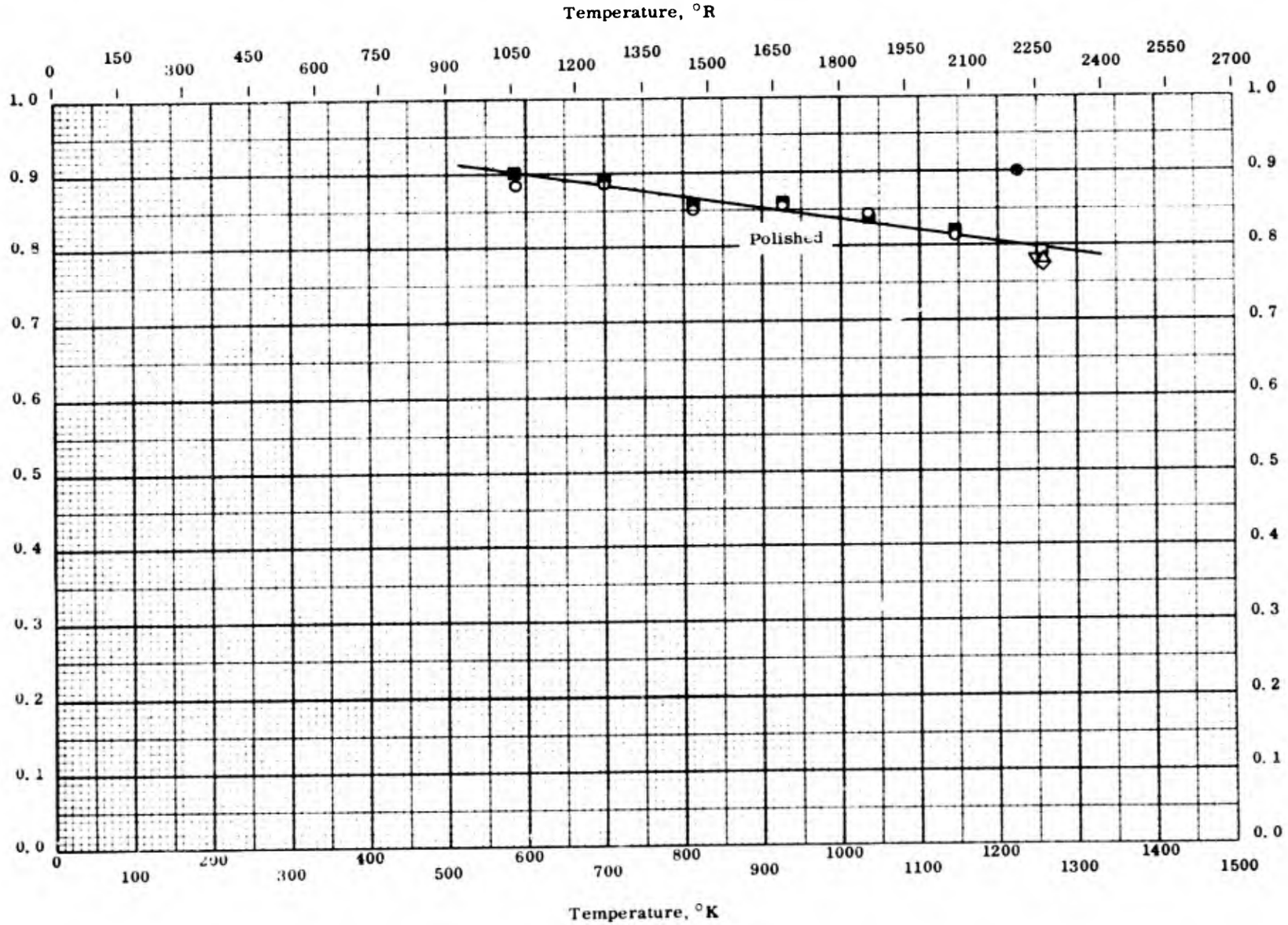


THERMAL LINEAR EXPANSION -- SILICON NITRIDE

THERMAL LINEAR EXPANSION -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	62-5	294-1365		Si_3N_4 from Carborundum Co.; calculated composition before exposure 60.08 Si and 39.91 N, elements found by semi-quantitative emission spectrography 0.7 Fe, 0.6 Ca, 0.3 Al, 0.1 Mn, Mg, Zr, Cr, and trace Ti; after exposure 0.49 C; density in g cm^{-3} at 25 C by ASTM method B311-58 before exposure 2.5 and after exposure 2.8; initial length 2.9835 in. [Author's design : Run SRI-E1].	Formed by A casting; measured in helium atm.
■	62-5	796-1365		Same as above.	Cooling of above sample to 974 F.
△	62-5	796-1375		Same as above.	Reheating of above sample to 2015 F.
▲	62-5	780-1375		Same as above.	Recooling of above sample to 945 F.
◇	62-5	780-2078		Same as above.	Final heating cycle for above sample.
◆	62-5	294-2078		Same as above.	Final cooling cycle for above sample; sample broken on post inspection.
○	51-7	293-1273		Si_3N_4; 70% porosity.	Hot pressed.

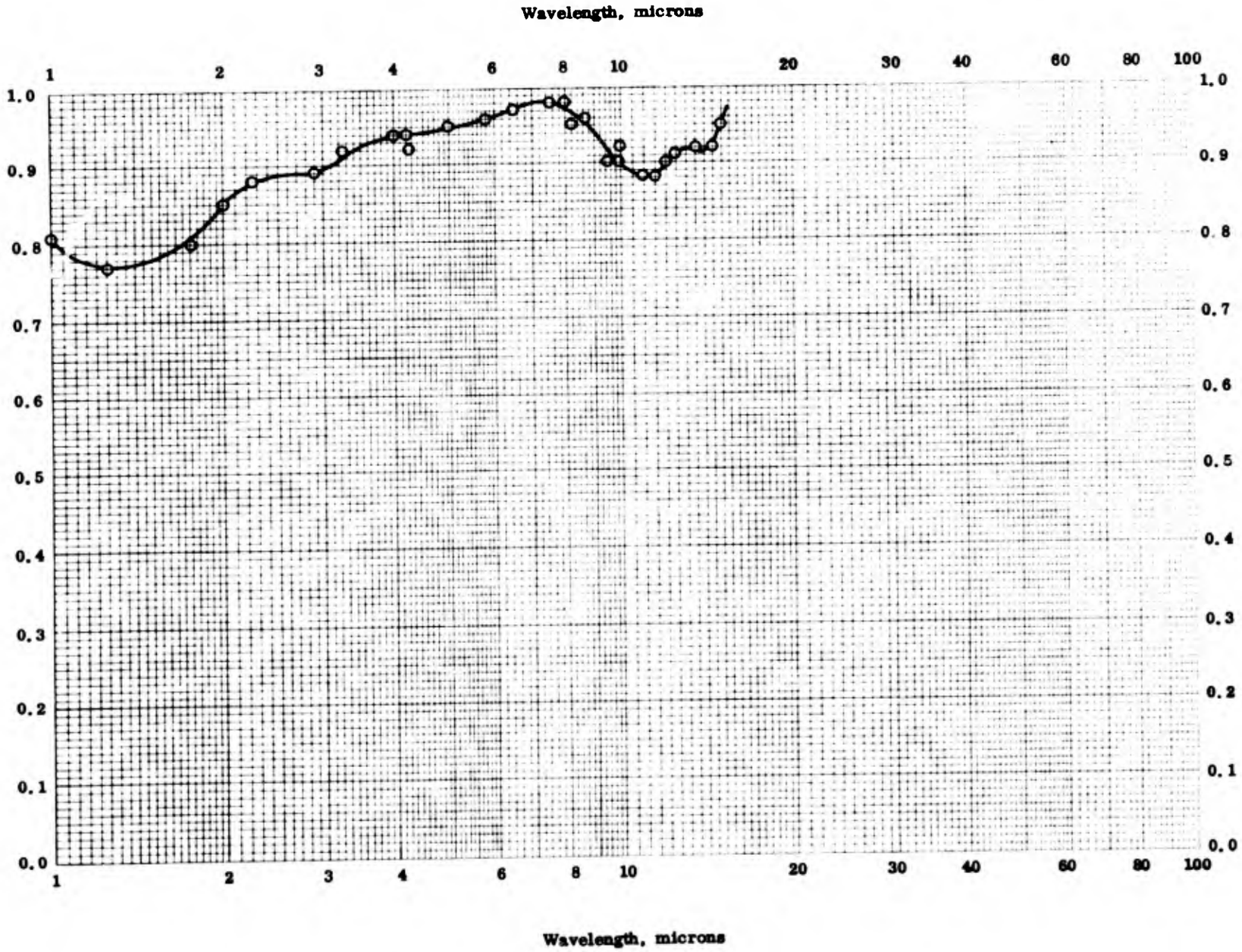


NORMAL TOTAL EMITTANCE -- SILICON NITRIDE

NORMAL TOTAL EMITTANCE -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
●	63-18	1223	±8	Si_3N_4; density 1.82 g cm^{-3}; 0.058 in. thickness.	Sintered at 1673 K for 2 hrs; measured in argon atmosphere; computed from spectral data.
□	62-25	1255		Si_3N_4 from Carborundum (Mix 2817-C).	Ground and polished; cleansing with alcohol and distilled water.
△	62-25	1255		Same as above.	Same as above; after heating at 1255 K in air for 3 min.
◇	62-25	1255		Same as above.	Same as above; after heating at 1255 K in air for 10 min.
▽	62-25	1255		Same as above.	Same as above; after heating at 1255 K in air for 20 min.
○	62-25	589-1255		Same as above.	Same as above.
■	62-25	589-1255		Same as above.	Same as above; sample No. 2.

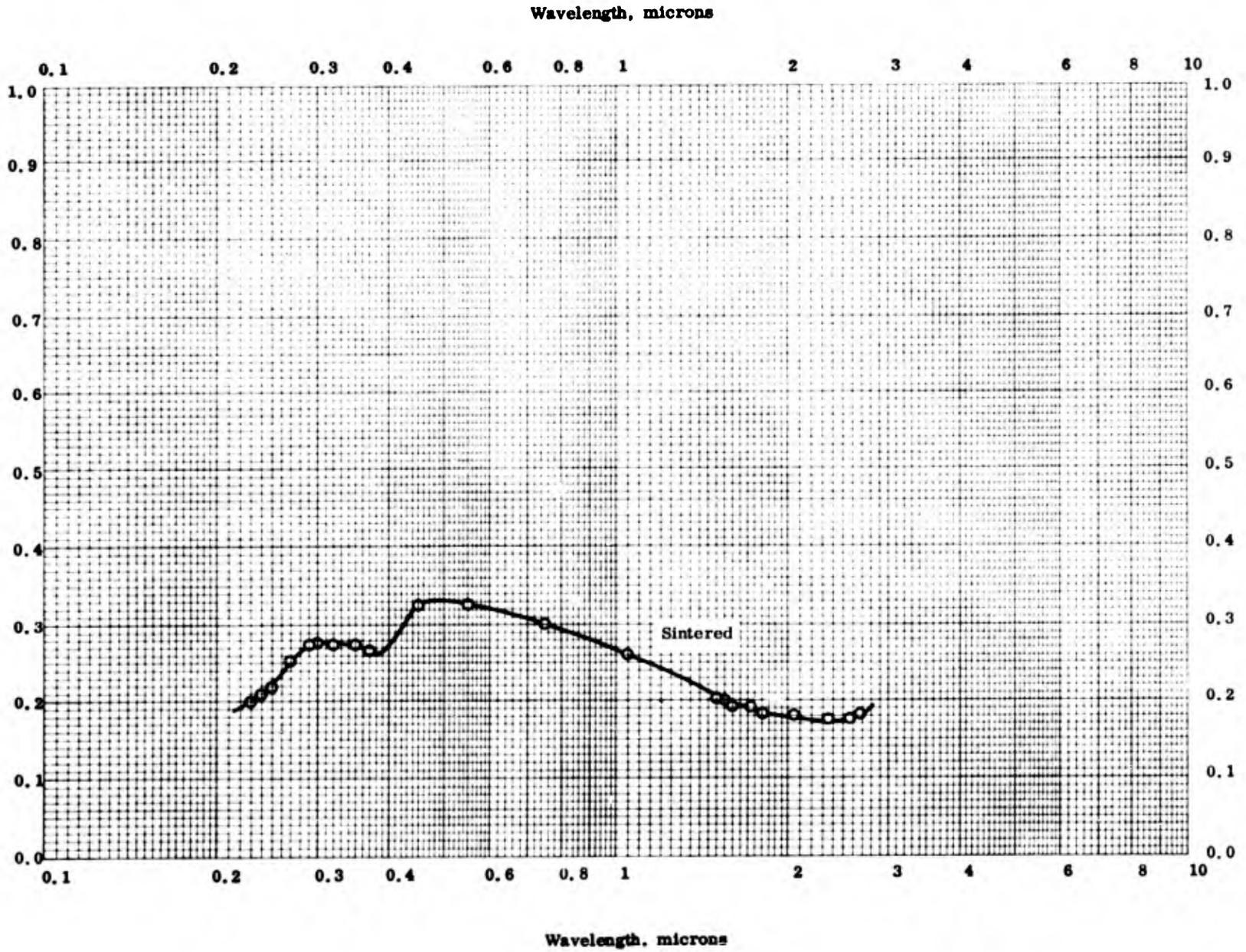


NORMAL SPECTRAL EMITTANCE -- SILICON NITRIDE

NORMAL SPECTRAL EMITTANCE -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	1223	1-15		Si_3N_4; density 1.82 g cm^{-3}; 0.058 in. thickness.	Sintered at 1673 K for 2 hrs; measured in argon atmosphere; data taken from a curve.



NORMAL SPECTRAL REFLECTANCE -- SILICON NITRIDE

NORMAL SPECTRAL REFLECTANCE -- SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	Si_3N_4; density 1.82 g cm^{-3} ; 0.058 in. thickness.	Sintered at 1673 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing, MgO as reference standard.

PROPERTIES OF TANTALUM NITRIDES

REPORTED VALUES

Density	g cm^{-3}	lb ft^{-3}
TaN	16.30*	1017*
Melting Point	**K**	**R**
○ TaN	3363**	6054**
□ Ta_2N	2323	4181
△ TaN	3360±50	6048±90
▽ TaN	3361	6050

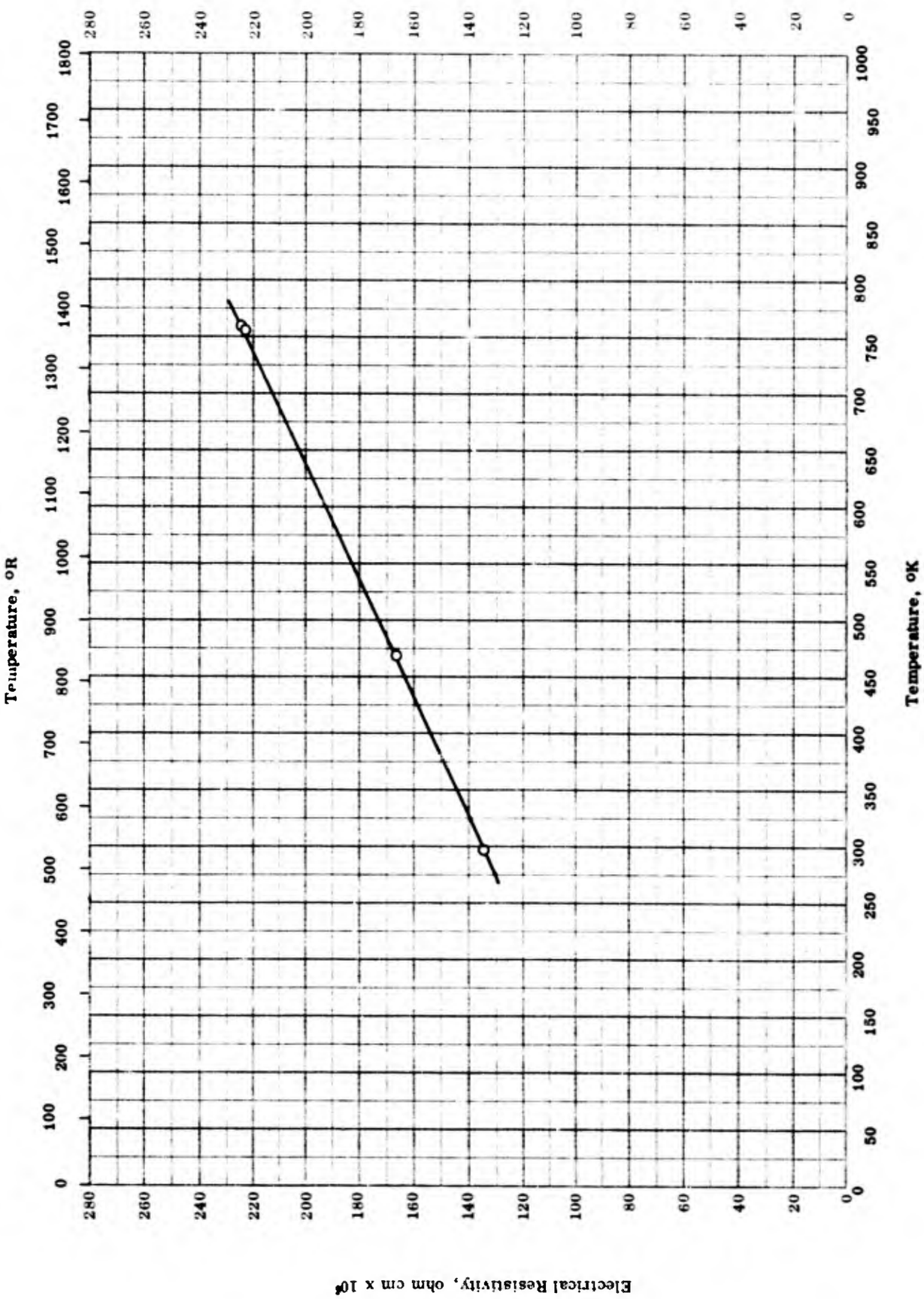
*Handbook of Chemistry and Physics (Ref. 64-18)

**Most probable value for this compound.

PROPERTIES OF TANTALUM NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	3363		TaN.	
□	62-48	2323		Ta_2N.	
△	54-3	3310-3410		TaN.	
▽	60-8	3361		TaN.	

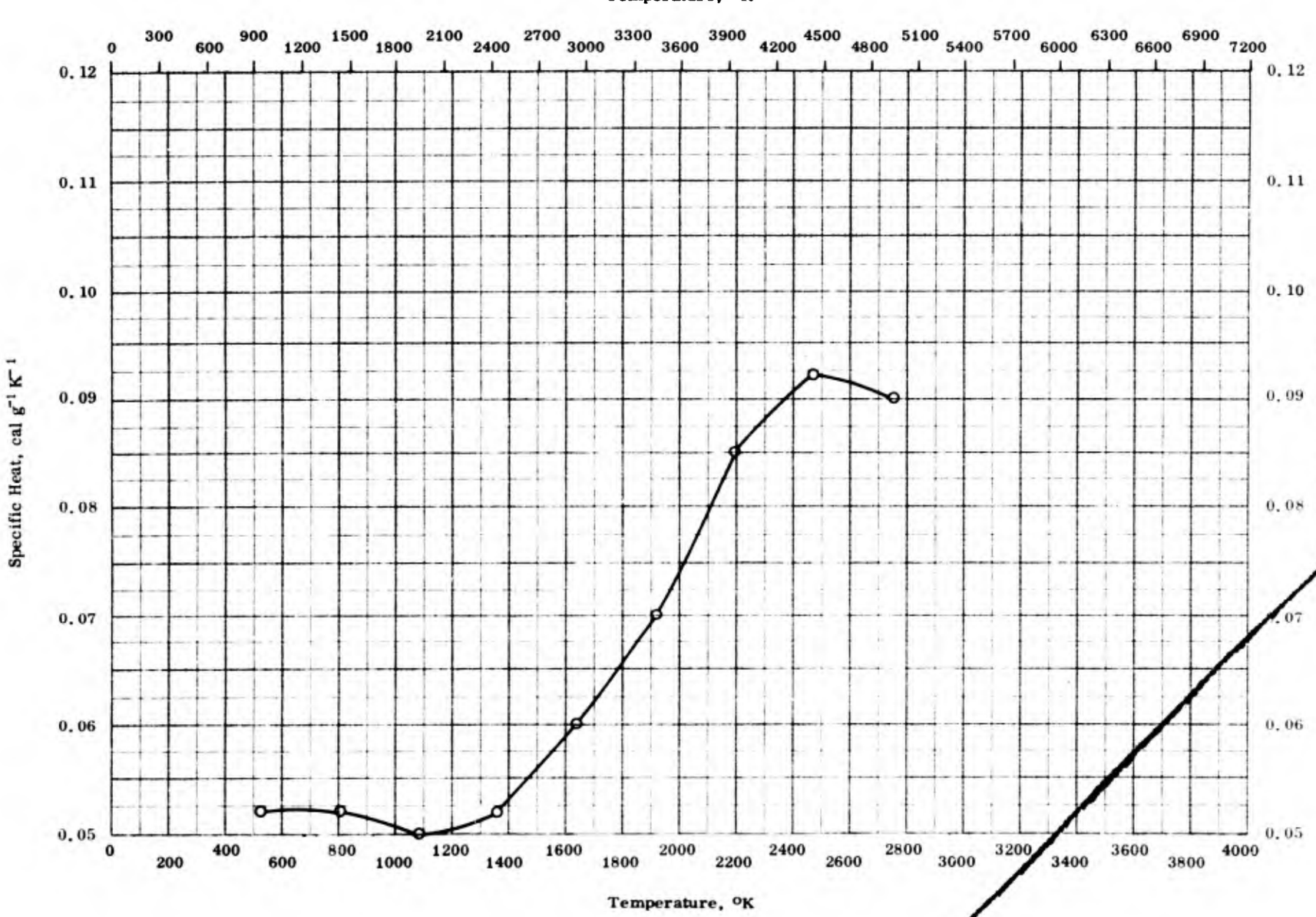


ELECTRICAL RESISTIVITY -- TANTALUM NITRIDE

ELECTRICAL RESISTIVITY -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	297-758	2.4	TaN; 95.7 Ta, 3.5 N, and 0.13 C.	Hot pressed; max exposure temperature 4900 F

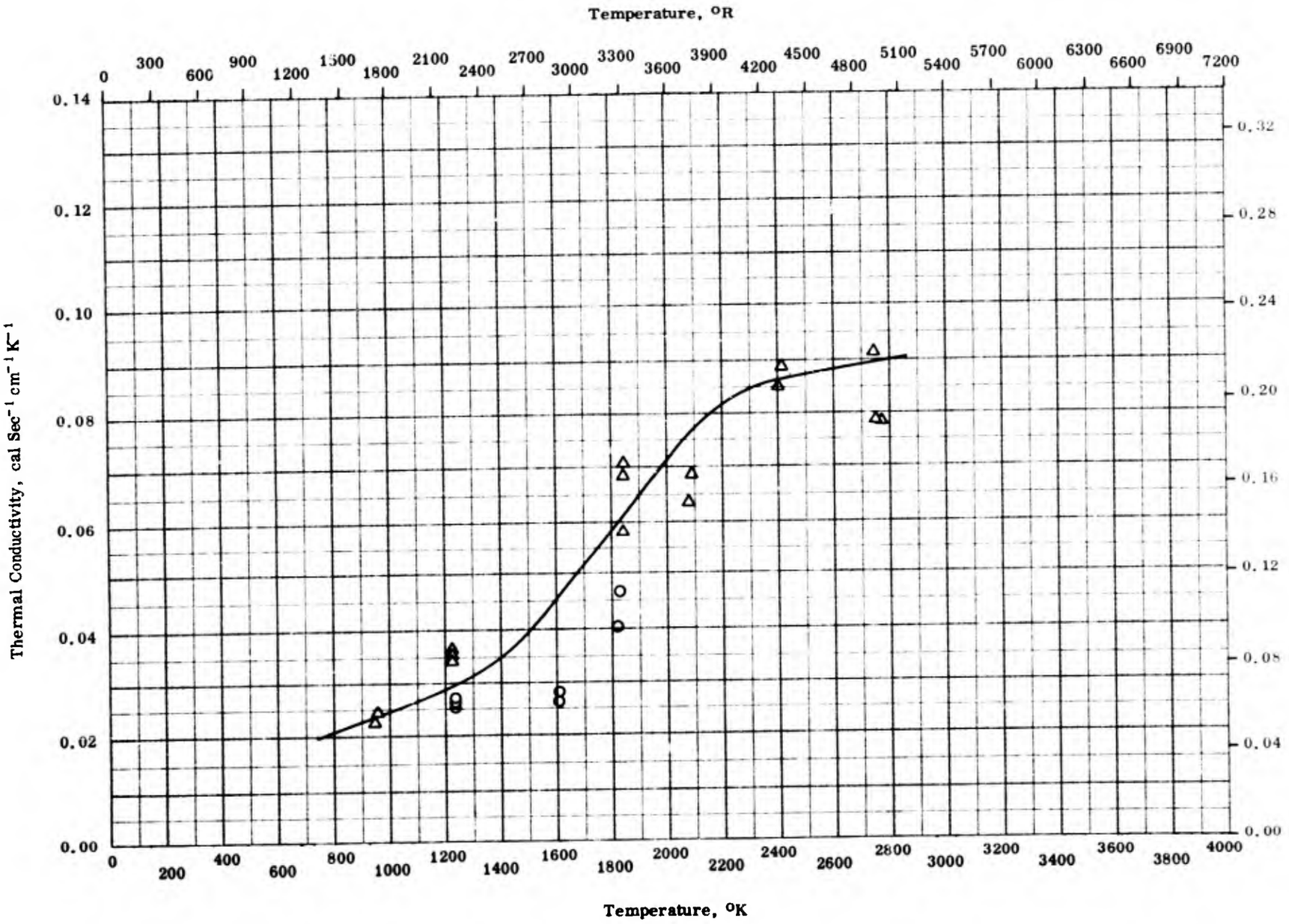


SPECIFIC HEAT -- TANTALUM NITRIDE

SPECIFIC HEAT -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	533-2755	≤5	TaN; before test: 95.7 Ta, 3.5 N, 0.3 Fe, 0.2 Si, 0.13 Ca, and 0.1 Mg; density 855 lb ft^{-3}; after test: 95.5 Ta, 3.1 N, and 0.95 C; density 910 lb ft^{-3}.	

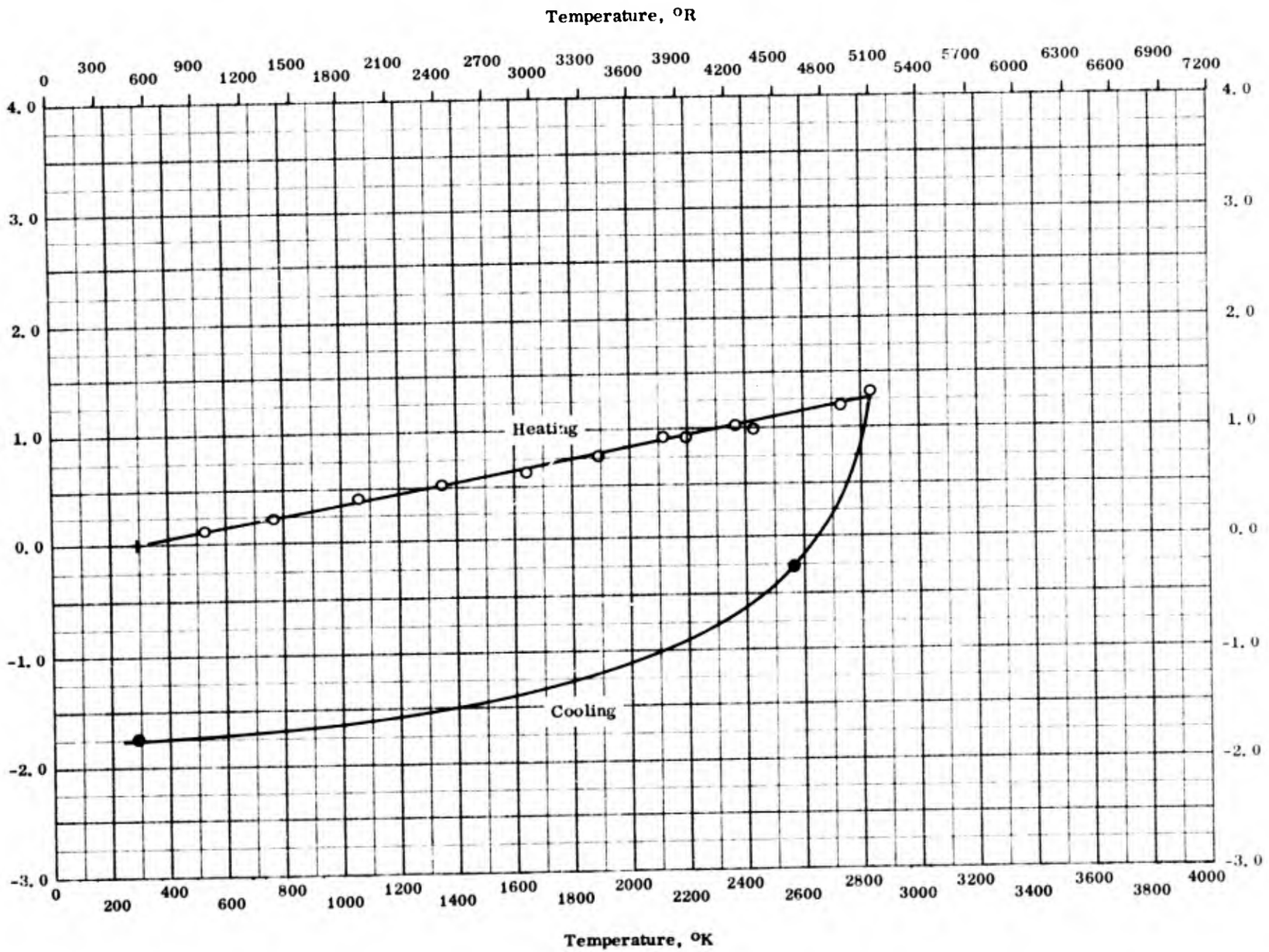


THERMAL CONDUCTIVITY -- TANTALUM NITRIDE

THERMAL CONDUCTIVITY -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-6	1237-1836		TaN.	Ground and polished thoroughly; heat-soaked at 3000 F; sample found broken on post inspection.
Δ	62-6	948-2765		TaN.	Same as the above sample except having not been heat-soaked; sample found broken on post inspection.

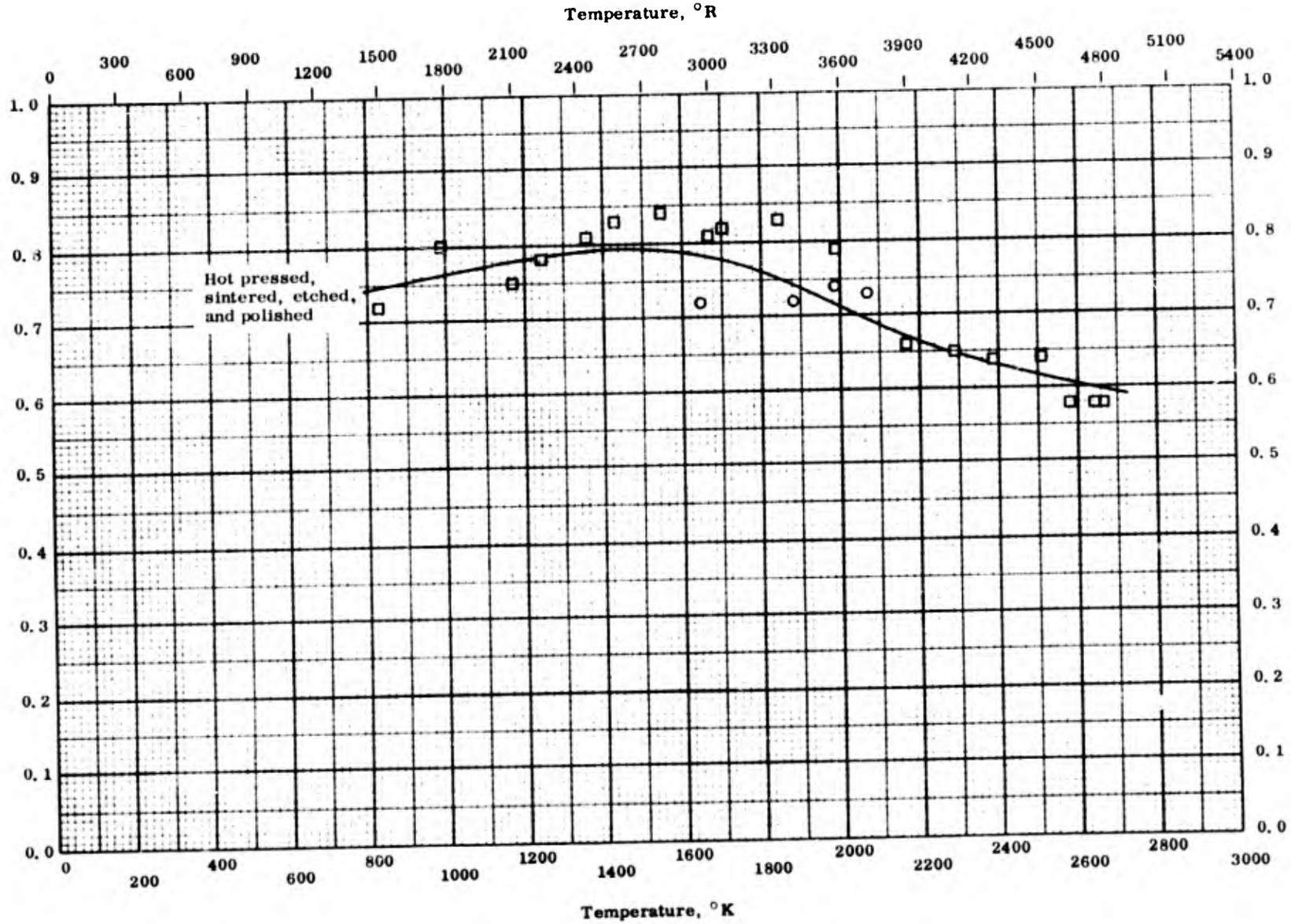


THERMAL LINEAR EXPANSION -- TANTALUM NITRIDE

THERMAL LINEAR EXPANSION -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	294-2839	5	TaN from Carborundum Co.; 95.7 Ta, 3.5 N, and 0.13 C; elements found by semi-quantitative emission spectrography before exposure 0.3 Fe, 0.2 Si, and 0.1 Mg; after exposure 95.5 Ta, 3.1 N, and 0.95 C; density at 25 C before and after exposure by ASTM method B311-58 13.4 g cm^{-3}; initial length 2.243 in. [Author's design : Run No. E2].	Hot pressed; measured in helium atm.
●	62-6	294-2839	5	Same as above; final length 2.229 in.	Cooling data for above sample; sample cracked on post inspection.



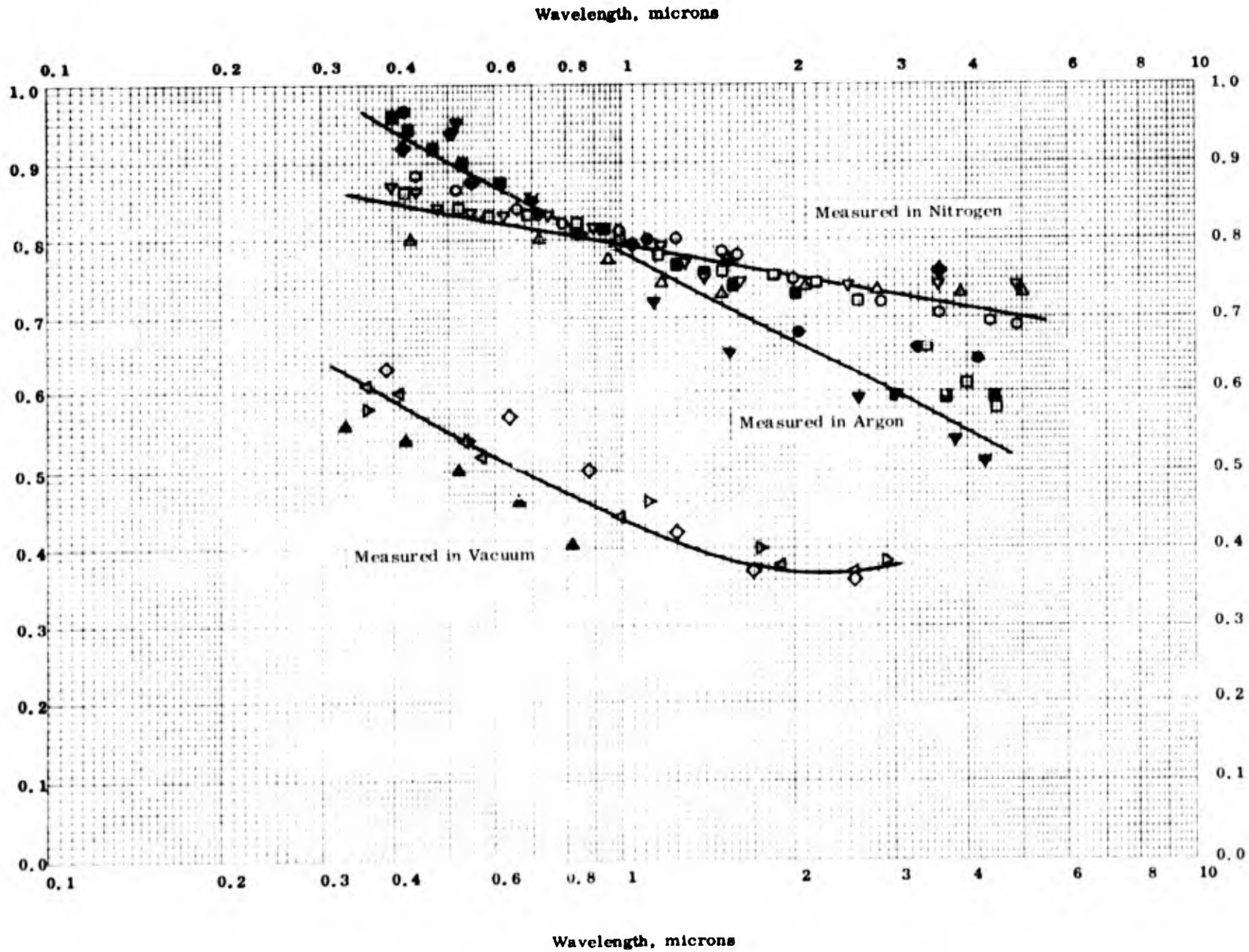
NORMAL TOTAL EMITTANCE -- TANTALUM NITRIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-1	1648-2070		TaN, from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in nitrogen at 2 atm; computed from spectral data.
□	62-6	830-2588	10	TaN; density 13.7 g cm^{-3}.	Hot-pressed; measured in argon atmosphere.



NORMAL SPECTRAL EMITTANCE -- TANTALUM NITRIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- TANTALUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	64-1	1648	0.44-4.90		TaN, from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in nitrogen at 2 atm.
□	64-1	1882	0.42-4.50		Same as above.	Same as above.
△	64-1	1990	0.43-5.00		Same as above.	Same as above.
▽	64-1	2070	0.40-4.90		Same as above.	Same as above.
◇	64-1	2047	0.33-2.55		Same as above.	Same as above except measured in vacuum of 10^{-5} mm Hg.
◁	64-1	2363	0.36-2.55		Same as above.	Same as above.
▷	64-1	2575	0.36-2.90		Same as above.	Same as above.
▲	64-1	2860	0.33-0.82		Same as above.	Same as above.
▼	64-10	1851	0.52-4.30		TaN.	Polished; measured in argon (1.5 atm).
●	64-10	1956	0.4-4.45		Same as above.	Same as above.
■	64-10	1648	0.52-4.30		Same as above.	Same as above.
◆	64-10	2132	0.43-3.6		Same as above.	Same as above.

PROPERTIES OF TITANIUM NITRIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
□	$TiN_{0.1}$	4.576	285.7
△	$TiN_{0.2}$	4.677	292.0
◇	$TiN_{0.3}$	4.742	296.0
▽	$TiN_{0.4}$	4.879	304.5
■	$TiN_{0.7}$	5.102	318.5
▲	TiN	5.256 ±0.043*	328.1 ± 2.7*
▼	TiN	5.24	327
●	TiN	4.09	255

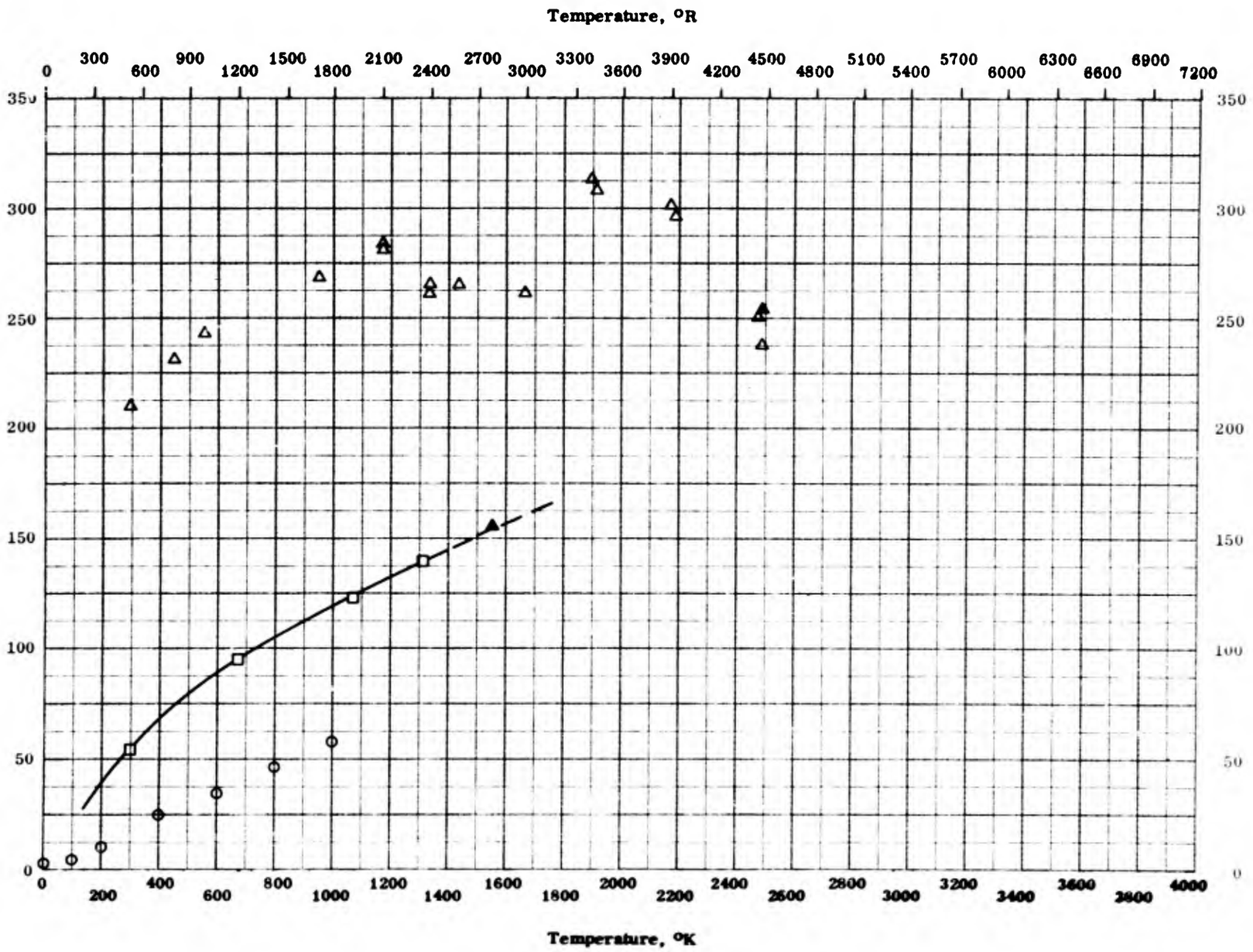
Melting Point		K	R
○	TiN	3223*	5802*
▷	TiN	3478	6260
◁	TiN	3205	5769

* Most probable value for this compound.

PROPERTIES OF TITANIUM NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	3223		TiN	
□	49-6	298	± 0.5	$TiN_{0.1}$; prepared by 99.9 Ti.	Synthetically prepared by sintering process: Ti acted upon by N_2 at 1200 C; density by micro-pyenometer.
△	49-6	298	± 0.5	$TiN_{0.2}$; same as above.	Same as above.
◇	49-6	298	± 0.5	$TiN_{0.3}$; same as above.	Same as above.
▽	49-6	298	± 0.5	$TiN_{0.4}$; same as above.	Same as above.
■	49-6	298	± 0.5	$TiN_{0.7}$; same as above.	Same as above.
▲	49-6	298	± 0.5	TiN; same as above.	Same as above.
▼	46-1	298		99.6 TiN with Si N as chief impurities; 77.4 Ti.	Powdered Ti heated in N_2 atm at 1000 C and at 1400 C for 10 hrs.
●	62-5	298		TiN.	Hot-pressed; max. exposure temperature 4700 F.
▷	58-10	3478		TiN.	
◁	60-8	3205		TiN.	



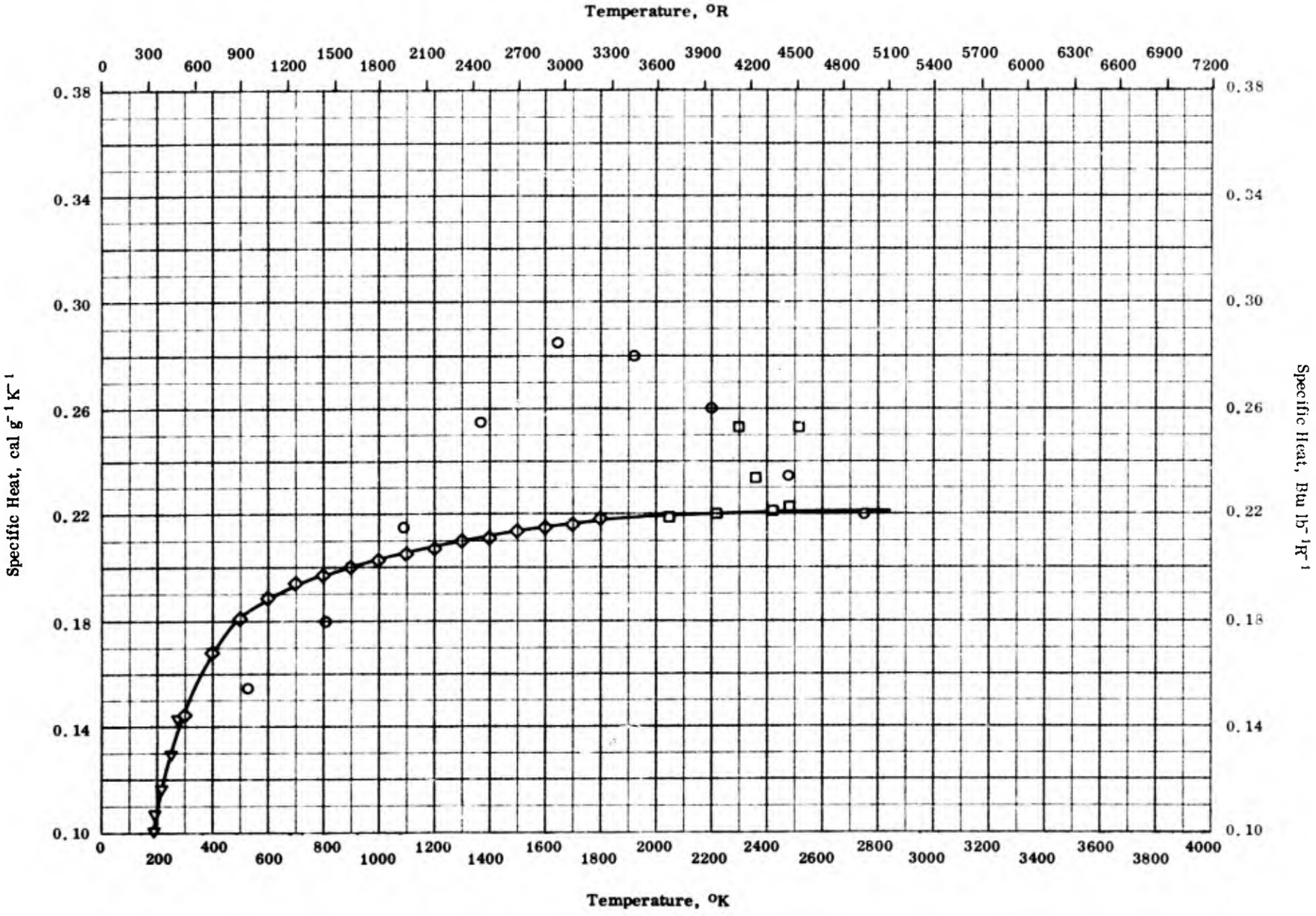
ELECTRICAL RESISTIVITY -- TITANIUM NITRIDE

Electrical Resistivity, ohm cm x 10⁶

ELECTRICAL RESISTIVITY -- TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-5	5.6-1000	± 10	TiN; 2 mm dia. wire.	Measured in vacuum or A or N_2.
△	62-6	297-2489	2.4	TiN; 81.3 Ti, 17.0 N, and 0.87 C; density 255 lb ft^{-3}.	Hot pressed; max. exposure temperature 4930 F.
▲	62-6	1544-2489		Same as above.	Cooling curve of the above sample.
□	64-3	298-1313		Single phase TiN; nitrogen deficient with 17.9 N_2, 77.9 Ti, and remainder oxygen formed as titanium oxides; porosity 10-20% with average grain size 11μ and density 4.78-4.91 g cm^{-3}.	Average of 2 samples.

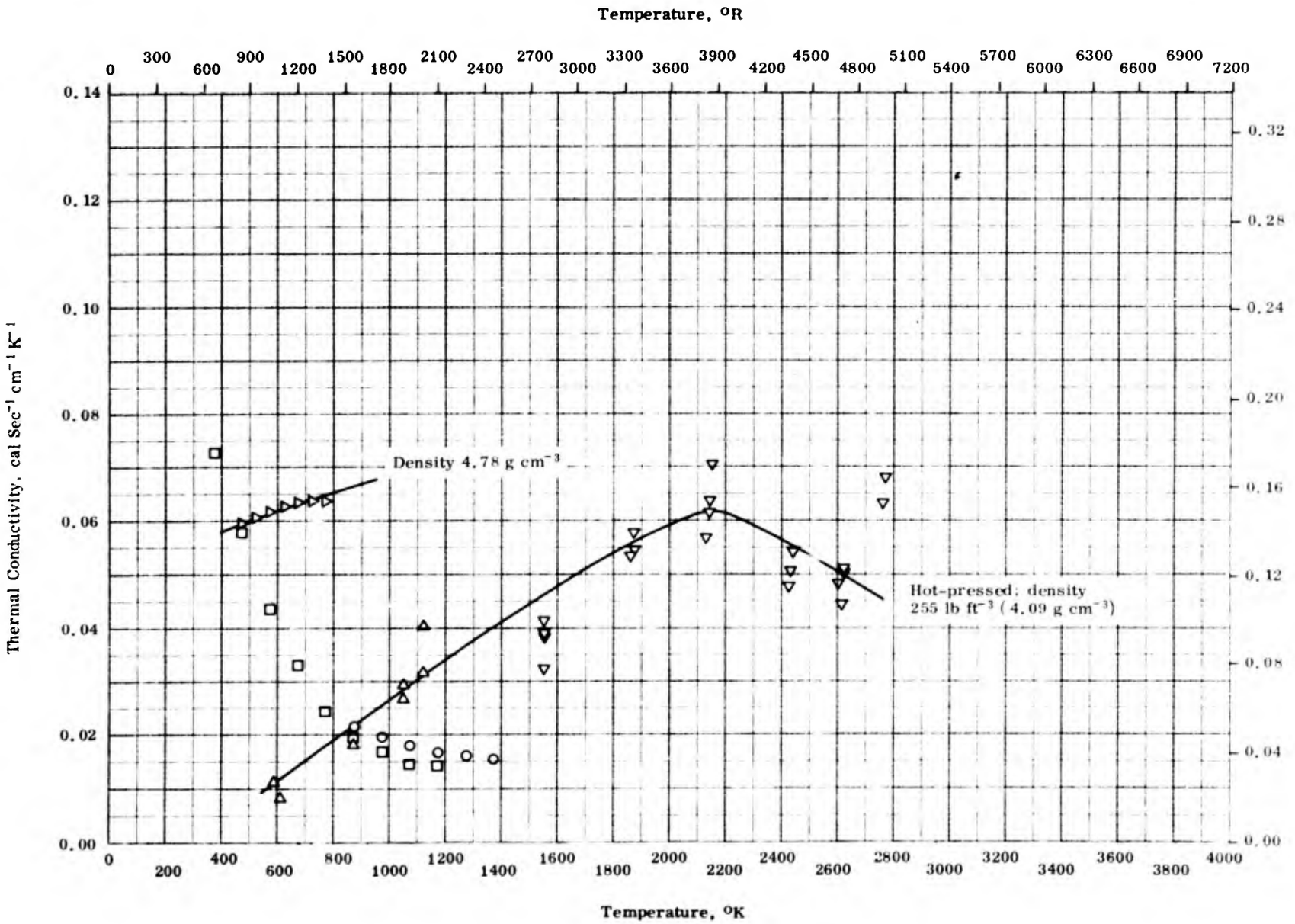


SPECIFIC HEAT -- TITANIUM NITRIDE

SPECIFIC HEAT -- TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	533-2755	≤5	TiN; before test: 81.3 Ti, 17.0 N, 0.87 C and 0.4 Fe; density 298 lb ft^{-3}; after test: 77.6 Ti, 18.9 N, and 1.2 C; density 321 lb ft^{-3}.	Hot pressed.
□	62-16	2052-2512	± 5	TiN.	
▽	46-2	53-298		99.5 TiN with major impurity SiN.	Prepared by heating powdered Ti in purified N_2 and H_2 gas at 1000 C and 10 hrs at 1400 C.
◇	46-1	298-1800		99.6 TiN with SiN major impurity; density 327 lb ft^{-3}.	Same as above.

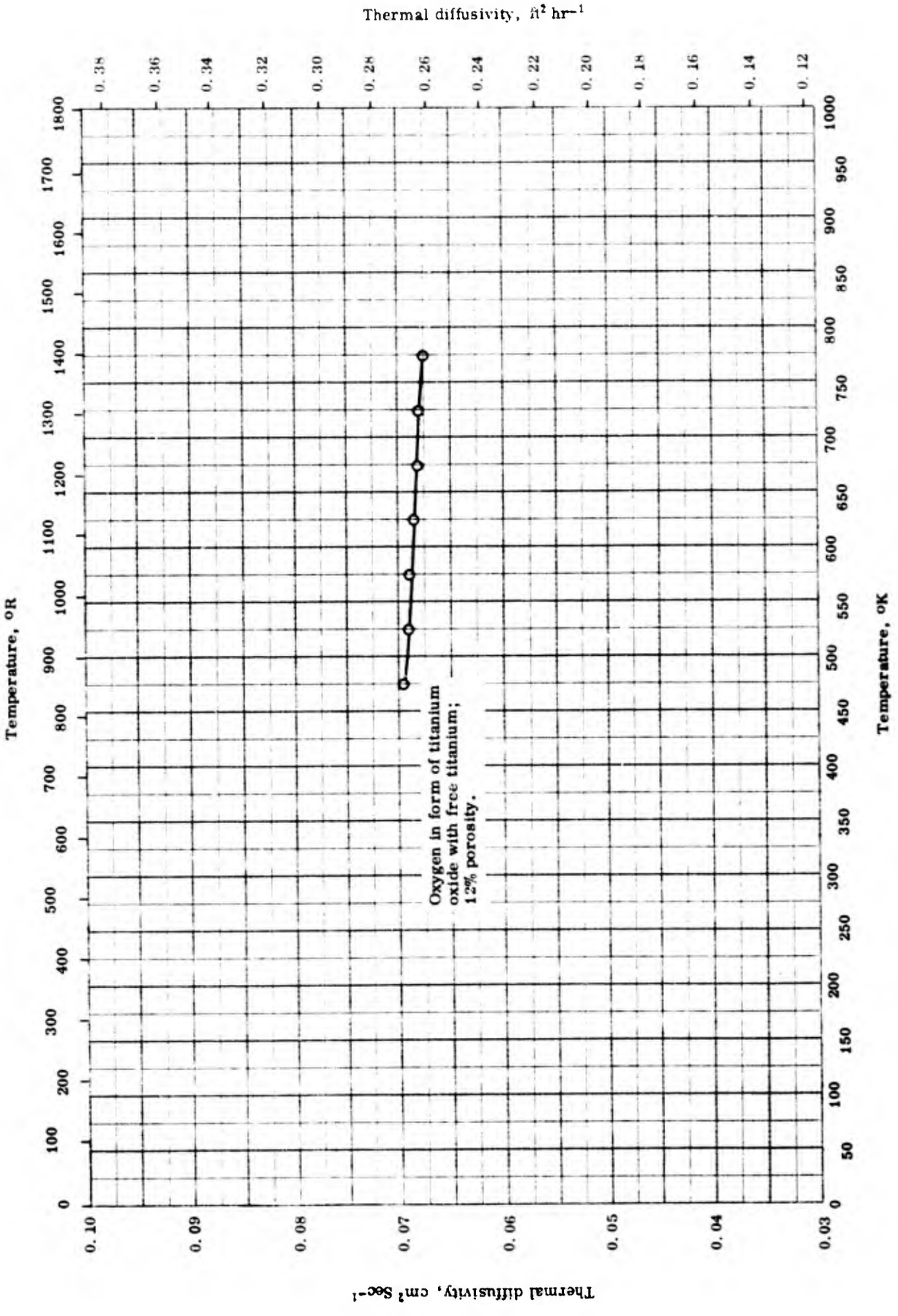


THERMAL CONDUCTIVITY -- TITANIUM NITRIDE

THERMAL CONDUCTIVITY -- TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	54-3	373-1173		77.8 Ti, 18.2 N (cf. theor. 77.5 Ti and 22.5 N), 2.6 O_2, and 1.4 others; porosity 19.0%.	Fired at 2100 C; dense sintered alumina used as standard.
○	54-3	773-1373		Same as above except porosity 19.8%.	Fired at 2100 C.
△	62-5	594-1119	2-4	TiN; density 255 lb ft^{-3}.	Hot-pressed; max. exposure temperature 4700 F.
▽	62-5	1553-2769	2-4	Same as above.	Same as above; sample found to be incipient melted after measurement.
▷	63-2	473-773		TiN; 77.9 Ti, 17.9 N_2, 0.9 > other metals, and the remainder being probably oxygen which may be tied up as titanium oxide; single phase with average grain size 11 μ; density 4.78 g cm^{-3}.	

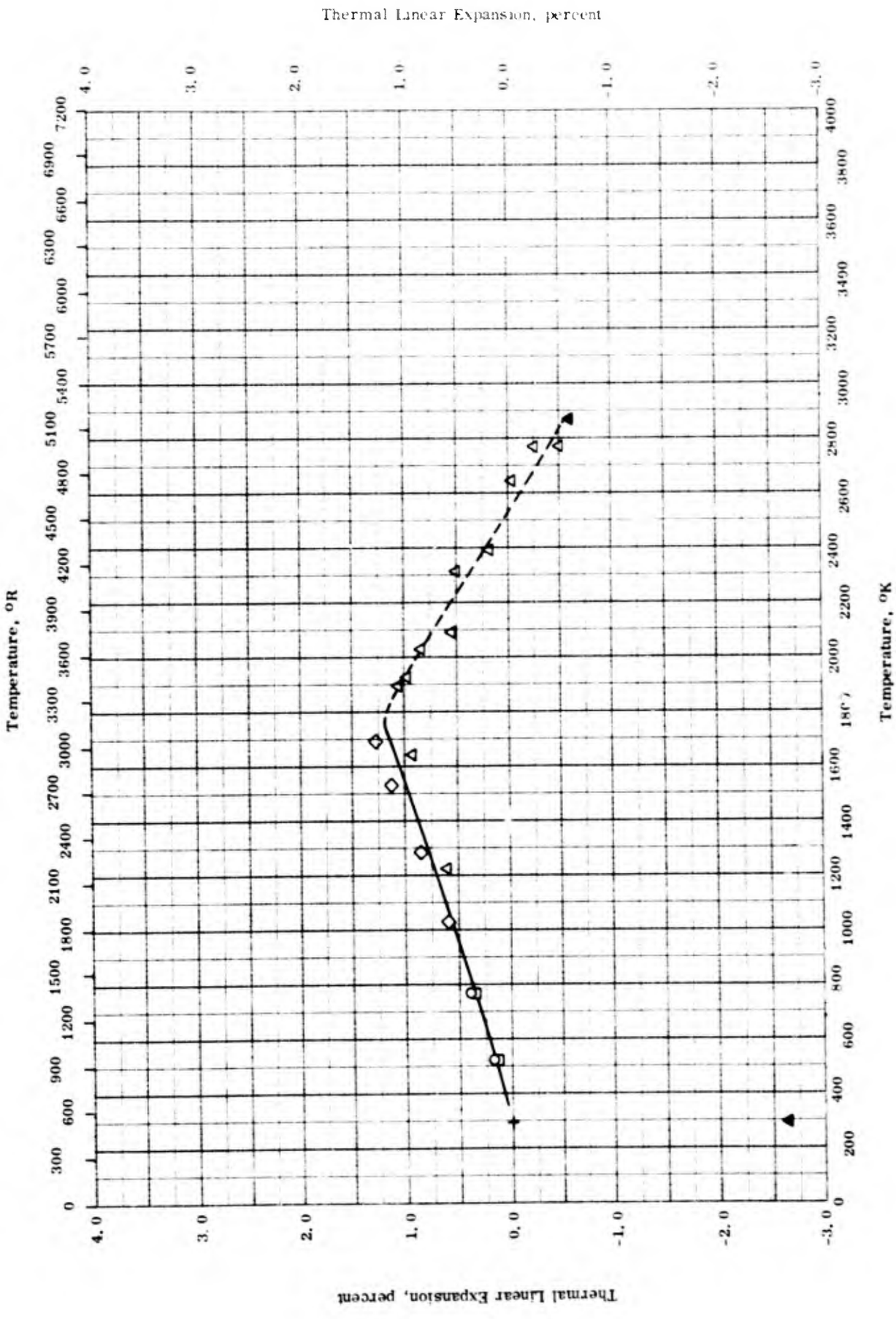


THERMAL DIFFUSIVITY -- TITANIUM NITRIDE

THERMAL DIFFUSIVITY -- TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Repr. Error %	Sample Specifications	Remarks
O	63-2	473-773		77.9 Ti, 17.9 N_2, and 0.9> other metals; chemical analysis after measurement; nitrogen deficient and oxygen in form of titanium oxide with free titanium; single phase with average grain size 11 μ; sample 0.250 in. dia and 0.100 in. long; density 4.78 g cm^{-3} and porosity 12%.	Machined from a sample of same purity.



THERMAL LINEAR EXPANSION -- TITANIUM NITRIDES

THERMAL LINEAR EXPANSION -- TITANIUM NITRIDES

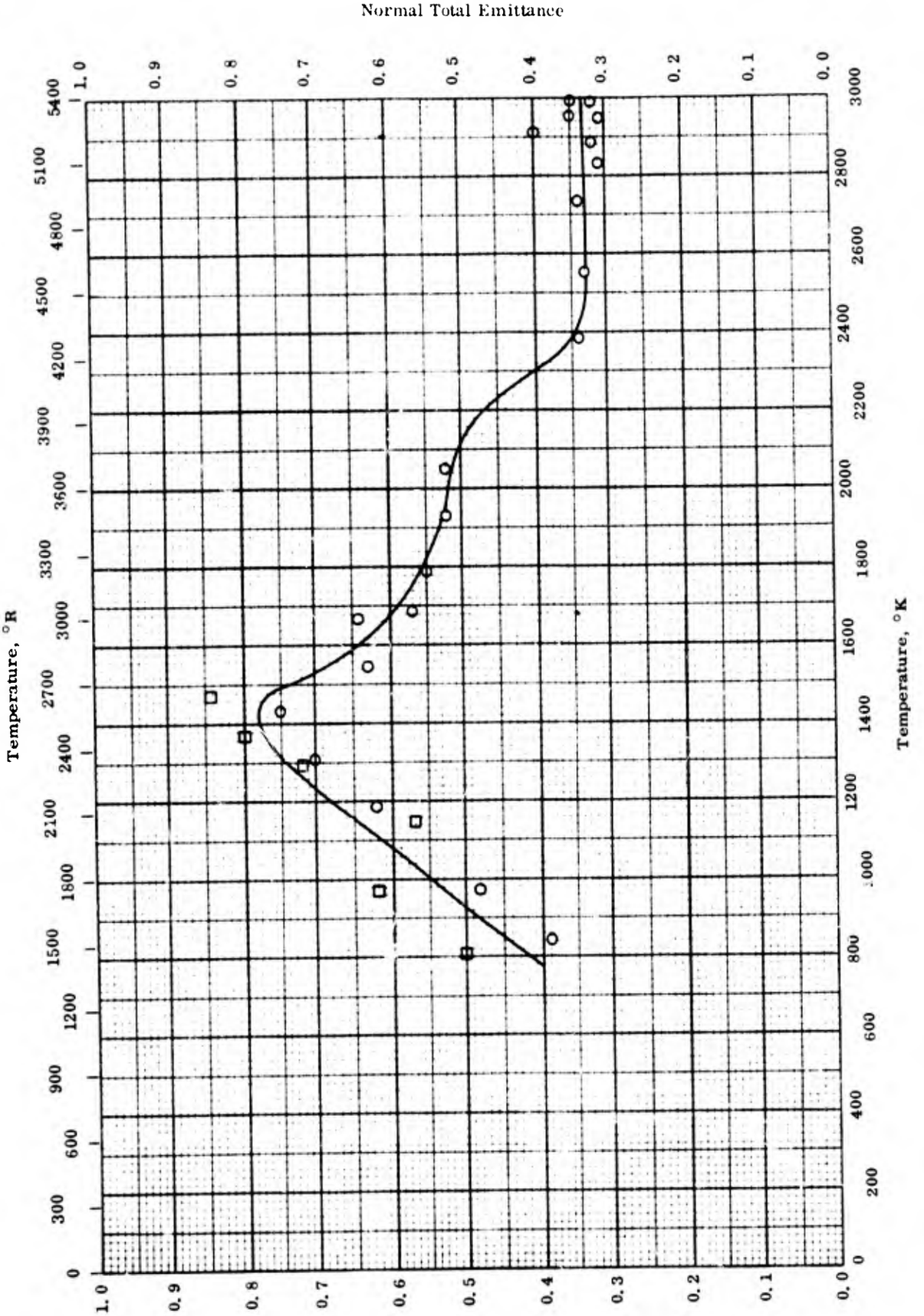
REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	64-16	298-773		$TiN_{0.59}$; 84.63 Ti, 14.67 N, 0.62 O, 0.11 C, 0.06 Al, 0.02 Sn, 0.01 Cr, 0.01 Cu, 0.01 Mn, 0.01 Ni, 0.01 Si, and 0.009 Fe; total impurity 0.95, total analysis 100.25; sample dimensions 1-1/8 x 1/2 x 3/16 in.	Prepared by passing NH_3 over TiH_2 in a recrystallized alumina boat with ZrH_2 getters at ends of tube at 1000 C for 1 hr, crushed by hand to less than 325 mesh in a steel mill, pressed at 88 psi with 1% camphor in ether and heated in a tungsten boat at 1220 C for 3 hrs in vacuum; measured under vacuum in the 10^{-6} mm Hg range; data measured with filtered CuK_α radiation.
□	64-16	298-773		$TiN_{0.78}$; 80.76 Ti, 18.26 N, 0.69 O, 0.11 C, 0.07 Fe, 0.04 Al, 0.04 Sn, 0.03 Ni, 0.02 Si, 0.01 Cr, 0.01 Cu, 0.01 Mn, and 0.01 Pd; total impurity 1.04; total analysis 100.06; sample dimensions 1-1/8 x 1/2 x 3/16 in.	Prepared by mixing 8.48 $TiN_{0.59}$ with 9.20 $TiN_{0.95}$, pressed at 14200 psi, heated in vacuum for 1 hr at 1300 C, 1-1/4 hrs at 1425 C, and 1-1/4 hrs at 1560 C; $TiN_{0.95}$ obtained by the same process used for $TiN_{0.95}$ except TiH was reacted for 3 hrs; data measured with filtered CuK_α radiation.
◇	63-32	298-1692		$TiN_{0.95}$; 76.91 Ti, 21.40 N, 0.73 O, 0.20 Fe, 0.12 C, 0.10 Al, 0.06 Si, 0.06 Zr, 0.03 Cr, and 0.02 Ni; total impurity 1.30; total analysis 99.61.	Prepared by pressing less than 325 mesh powder at 16000 psi and heating in flowing NH_3 atm to 1350 C for 2 hrs; data obtained from (420) and (422).

(Continued onto next page)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	62-5	294-2867	2	TiN from General Atrometals Corp.; before exposure 81.3 Ti, 17.0 N, 0.87 C, and 0.4 Fe; after exposure 77.6 Ti, 18.9 N, and 1.02 C; density at 25 C by ASTM method B311-58 before exposure 4.78 g cm^{-3}; after exposure 4.59 g cm^{-3}; initial length 1.8980 in. [Author's design.: Run SRI-E20].	Hot pressed; measured in helium atm.
▲	62-5	294-2867	2	Same as above; final length 1.8440 in.	Cooling data for above sample.



NORMAL TOTAL EMITTANCE -- TITANIUM NITRIDE

NORMAL TOTAL EMITTANCE -- TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-6	841-2994	10	TiN; density 4.90 g cm^{-3}.	Hot-pressed; measured in dry argon atmosphere.
□	62-6	810-1477	10	Same as above.	Same as above; another run.

PROPERTIES OF URANIUM NITRIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
□	UN	14.3	893
△	$UN_{1.712}$	4.9	306
◇	$UN_{1.712}$	11.3	705
◁	U_2N_3	11.24	701.7
▷	UN_2	11.73	732.3

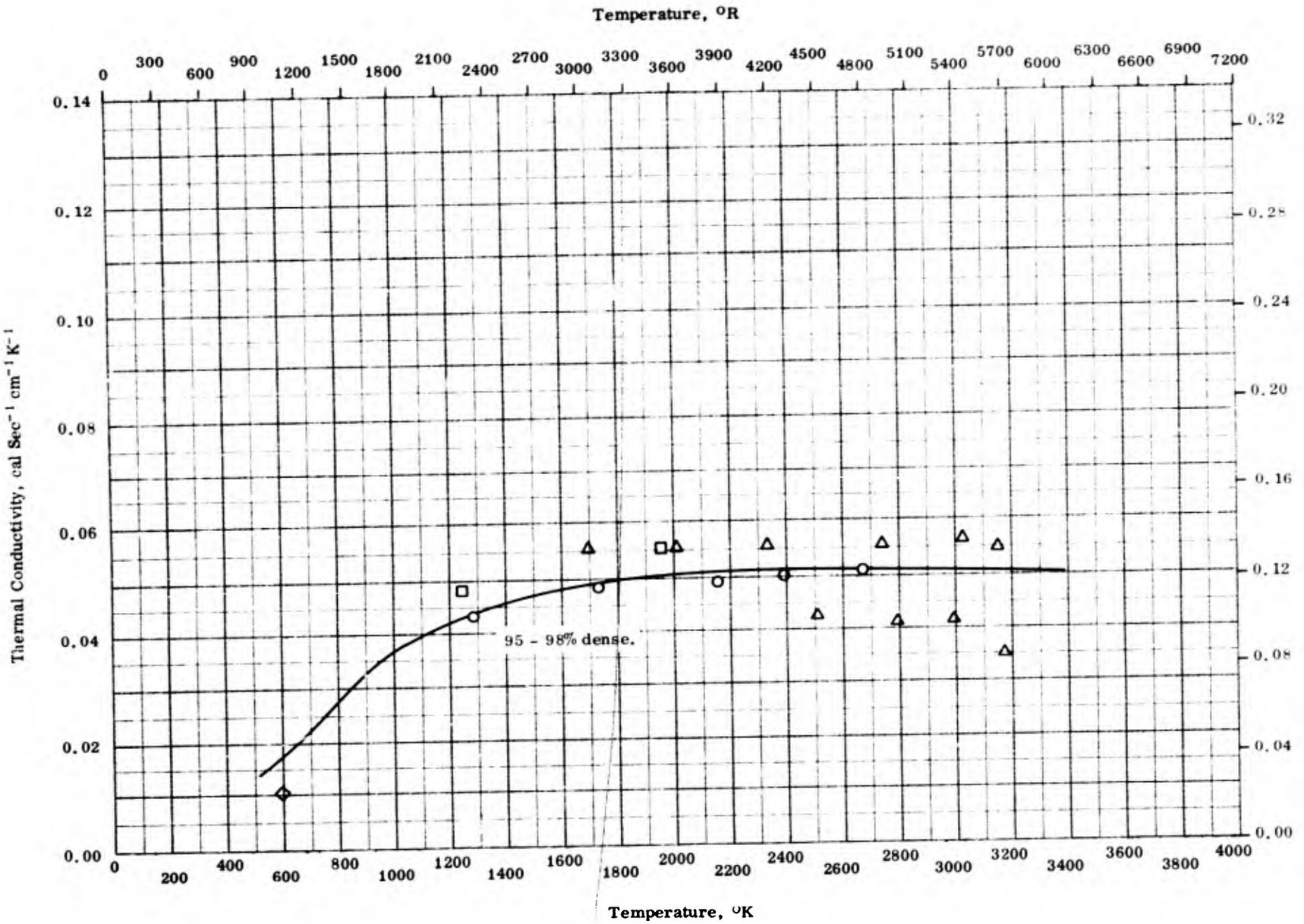
Melting Point		K	R
○	UN	2920± 50	5260± 90
▽	UN	2900	5220
●	UN	3158± 50	5684± 50
■	UN	3073± 50*	5531± 90*
▲	UN	3123 ± 50	5621 ± 90

* Most probable value for this compound.

PROPERTIES OF URANIUM NITRIDES

REFERENCE INFORMATION

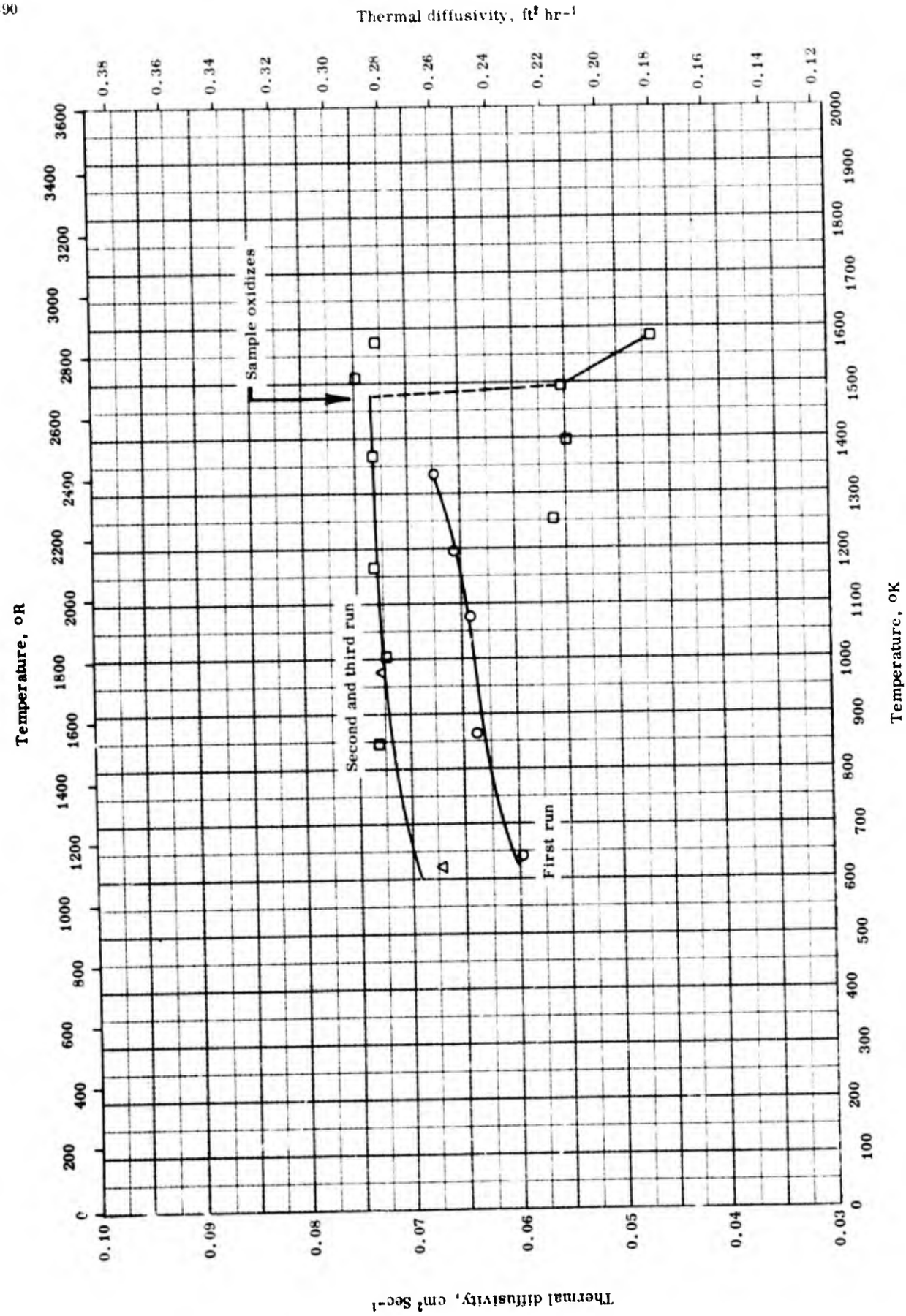
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	52-7	2923		UN.	Prepared by passing NH_3 over U shavings; author reported density 14.32 g cm^{-3} from x-ray measurement of lattice; M.P. by visual observation.
□	57-23	298		UN.	Density computed from x-ray measurement of lattice.
△	48-7	298		$UN_{1.712}$	U heated to 450 C; bulk density.
◇	48-7	298		$UN_{1.712}$	Same as above; density by weight in air and in hexane.
▽	48-7	2900		UN	U heated to 450 C.
◁	48-7	298		U_2N_3	U heated to 450; density computed from x-ray measurement of lattice.
▷	48-7	298		UN_2.	Same as above.
●	63-33	3108-3208		UN	
■	64-17	3023-3123		UN; 0.047 C and 0.055 O_2.	Discomposition temperature measured at 1 atm of N_2.
▲	64-17	3073-3173		Same as above.	Same as above except measurement in 2.5 atm of H_2.



THERMAL CONDUCTIVITY -- URANIUM MONONITRIDE

REFERENCE INFORMATION

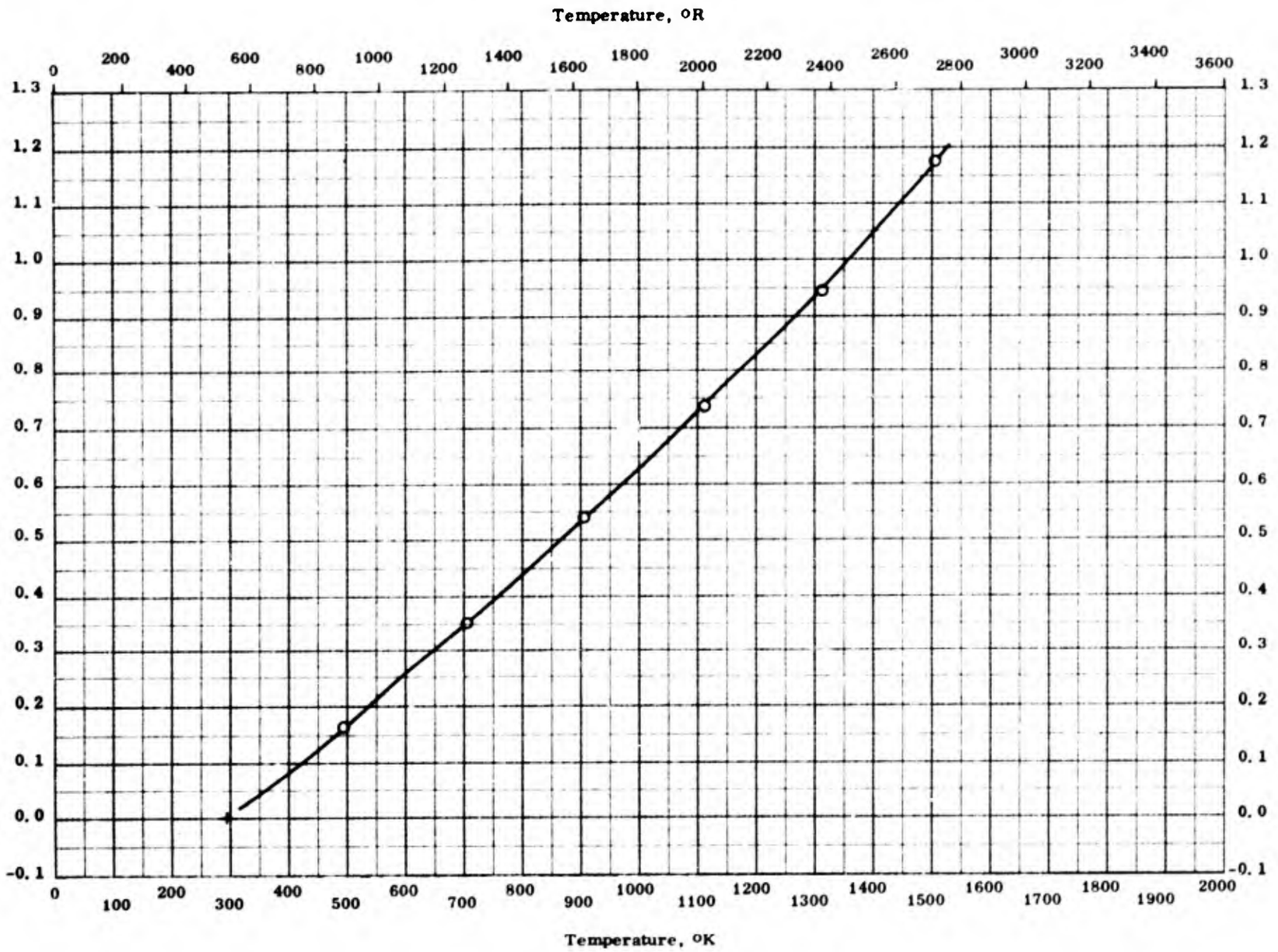
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-3	640-1333		UN; 95% to 98% dense.	Hot-pressed.
△	63-3	845-1583		UN; 95% to 98% dense.	Second run of above sample.
□	63-3	620-976		UN; 95% to 98% dense.	Another sample.
◇	52-1	298		UN.	Author assumed uncertainly factor of 2.



THERMAL DIFFUSIVITY -- URANIUM MONONITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-3	640-1333	±10	95 to 98% dense.	Hot-pressed.
□	63-3	845-1583	±10	Same as above.	The second run of the above sample; sample oxidized around 1200-1300 C.
△	63-3	620-976	±10	Same as above.	Hot-pressed; third run.

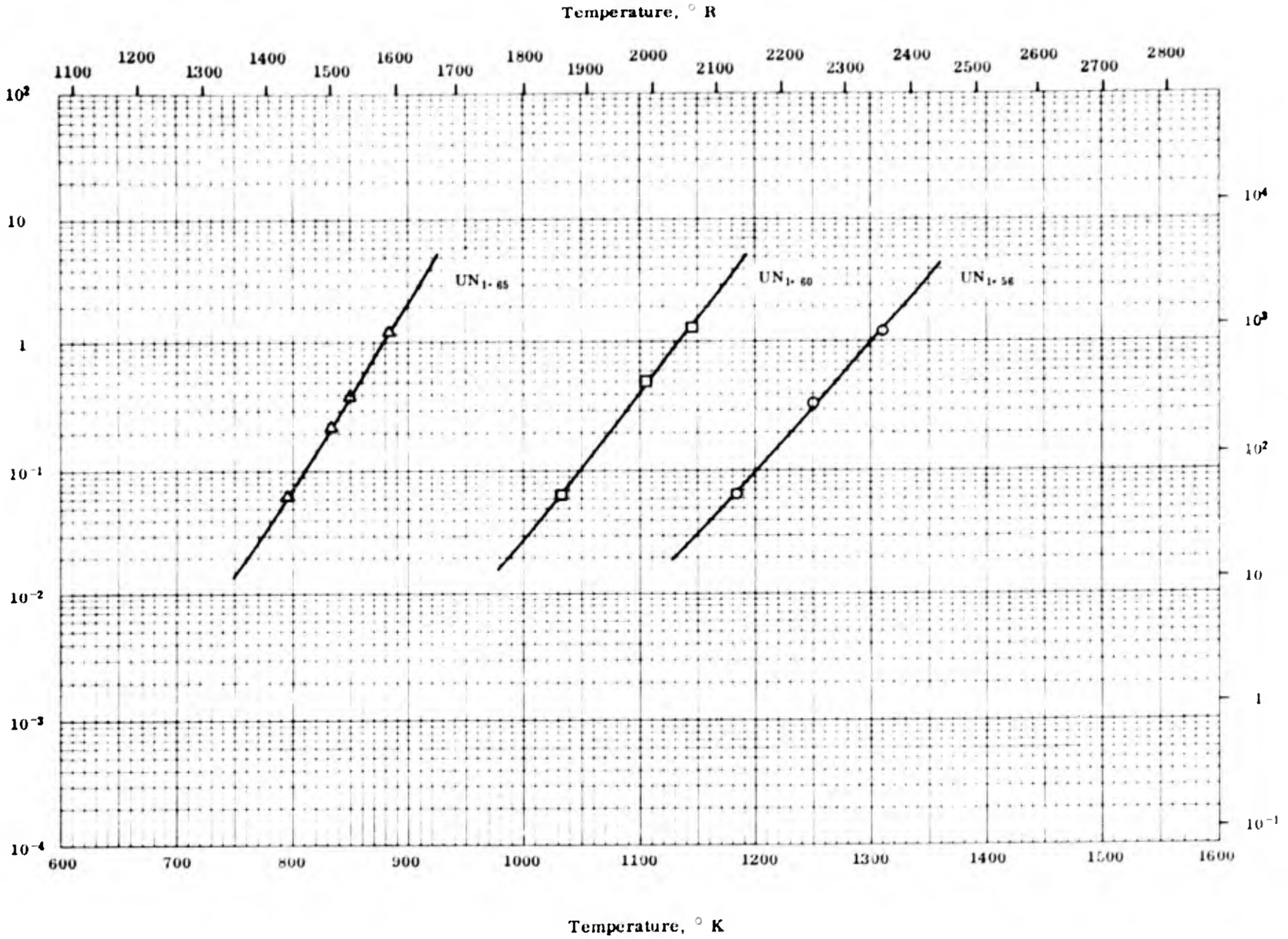


THERMAL LINEAR EXPANSION -- URANIUM MONONITRIDE

THERMAL LINEAR EXPANSION -- URANIUM MONONITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	61-19	298-1503		UN; dimensions 3 in. x 1/2 in. x 1/2 in.	Cold pressed at 12,000 psi and sintered at 1850 C in vacuum; measured in argon atm.



VAPOR PRESSURE -- URANIUM NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	45-2	795-1311		$UN_{L\ 56}$.	Nitrogen pressure.
□	45-2	795-1311		$UN_{L\ 60}$.	Same as above.
△	45-2	795-1311		$UN_{L\ 65}$.	Same as above.

PROPERTIES OF VANADIUM NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	6.13*	383*
Melting Point	2633	4739

*Handbook of Chemistry and Physics (Ref. 64-18)

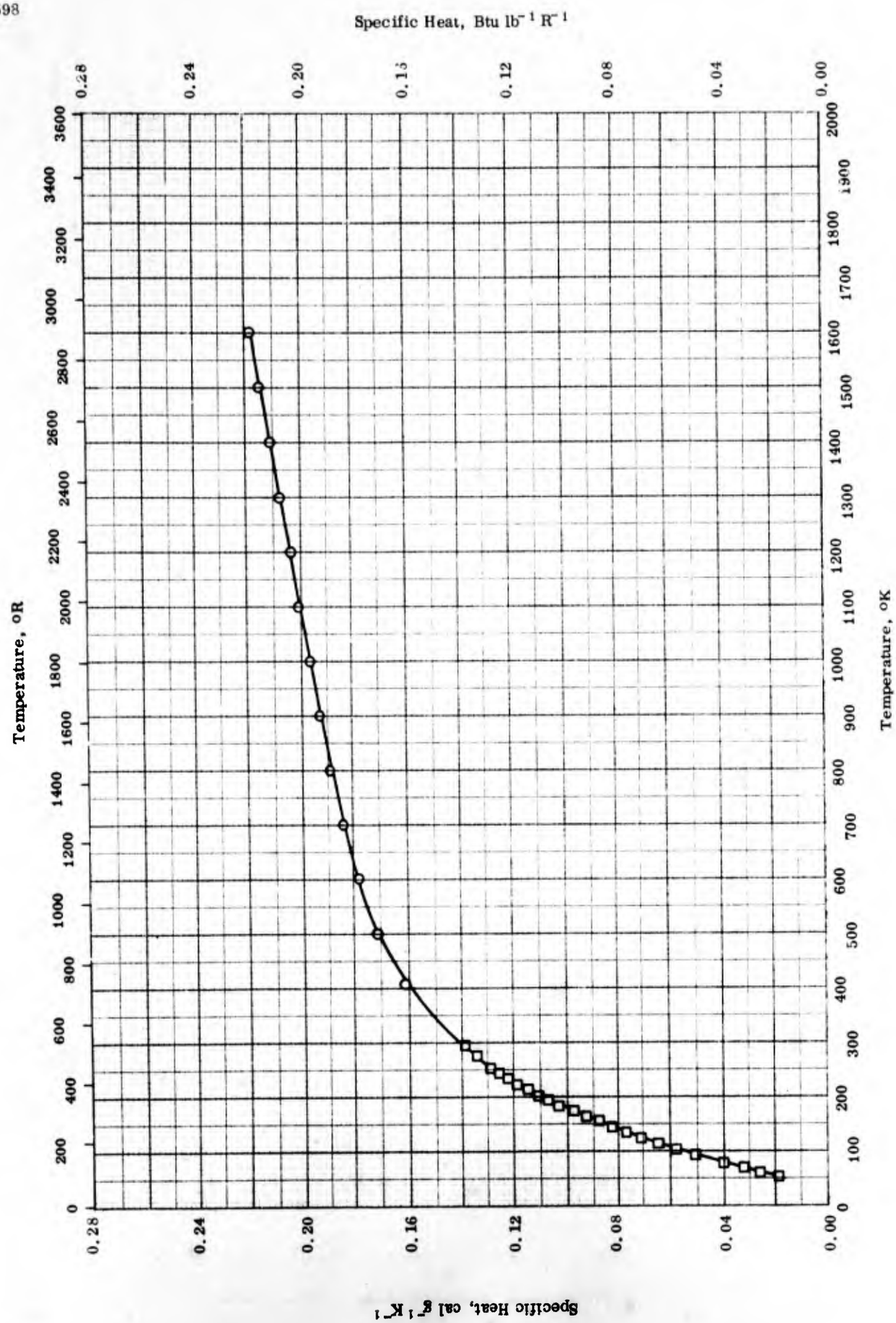
REPORTED VALUES

Melting Point	K	R
O	2323	4182
□	2633	4739

PROPERTIES OF VANADIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	56-11	2323		VN.	
□	58-10	2633		VN.	

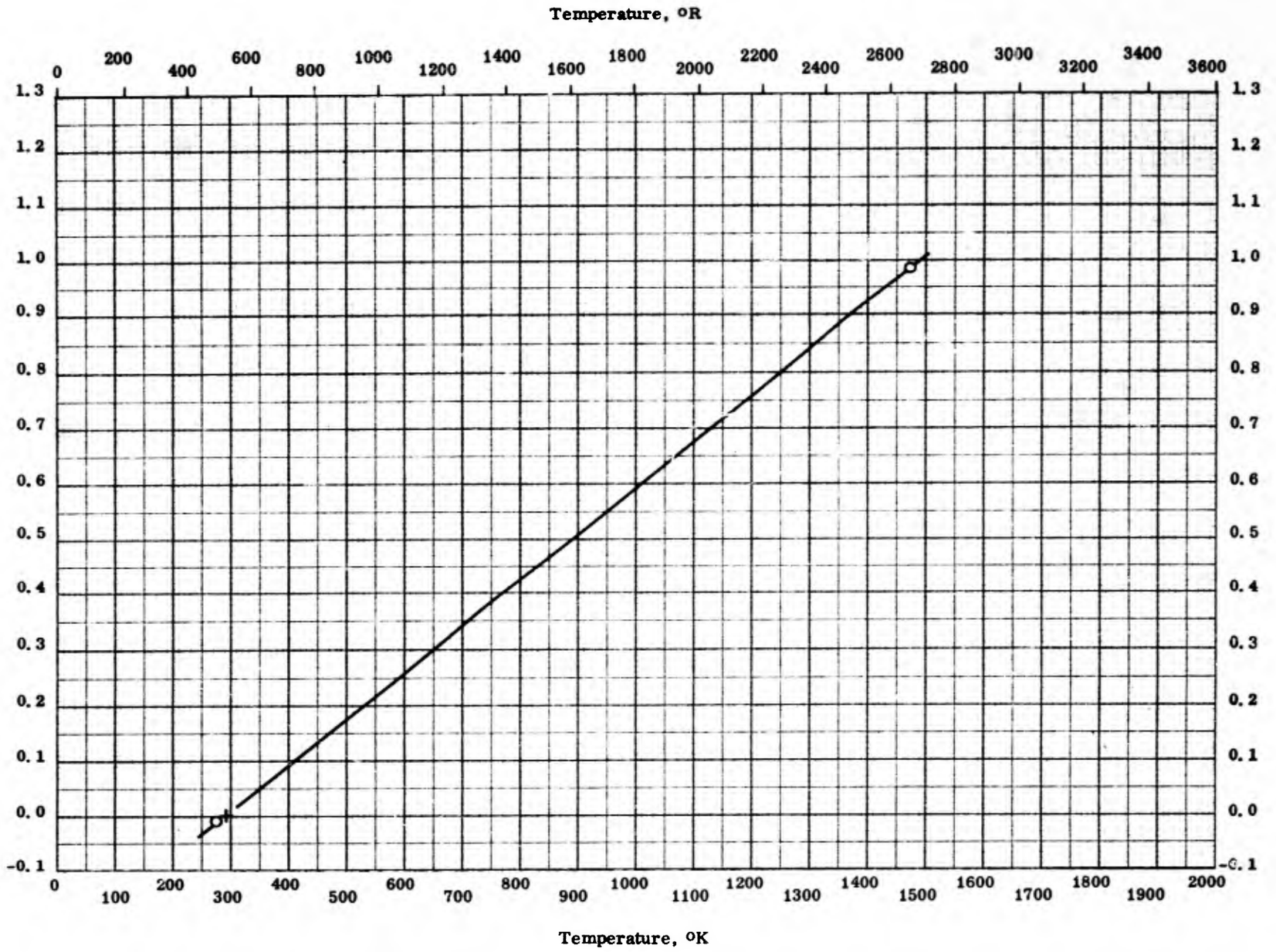


SPECIFIC HEAT -- VANADIUM NITRIDE

SPECIFIC HEAT -- VANADIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-3	408-1611		VN; 78.24 V and 0.05 C.	Heated 28 hrs at 1200 C, cooled and reground at 7 hrs intervals.
□	49-4	53-298		VN; 78.24 V and 0.05 C.	Same as above.



THERMAL LINEAR EXPANSION -- VANADIUM NITRIDE

THERMAL LINEAR EXPANSION -- VANADIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-36	273-1473		VN; zero porosity.	

PROPERTIES OF ZIRCONIUM NITRIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	6.84	427
Melting Point	3253	5855

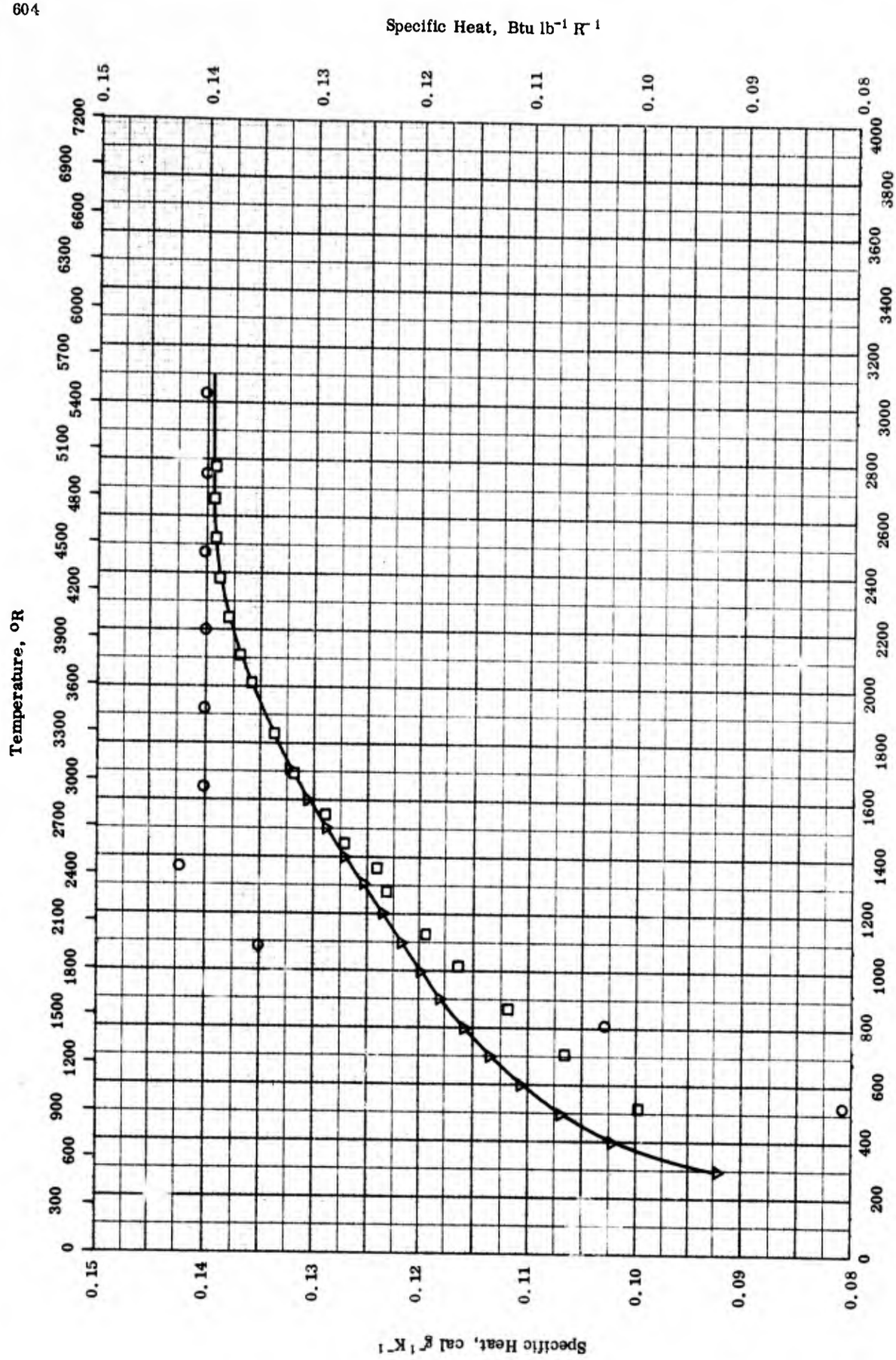
REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
	○	6.84	427
Melting Point		K	R
	□	2853	5136
	△	3253	5855
	▽	3203	5765
	◇	3267	5880

PROPERTIES OF ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	298		ZrN.	Pressed and sintered; max. exposure temperature 4810 F.
□	56-11	2853		Zr N.	
△	58-10	3253		Zr N.	
▽	62-49	3203		Zr N.	
◇	60-8	3267		Zr N.	

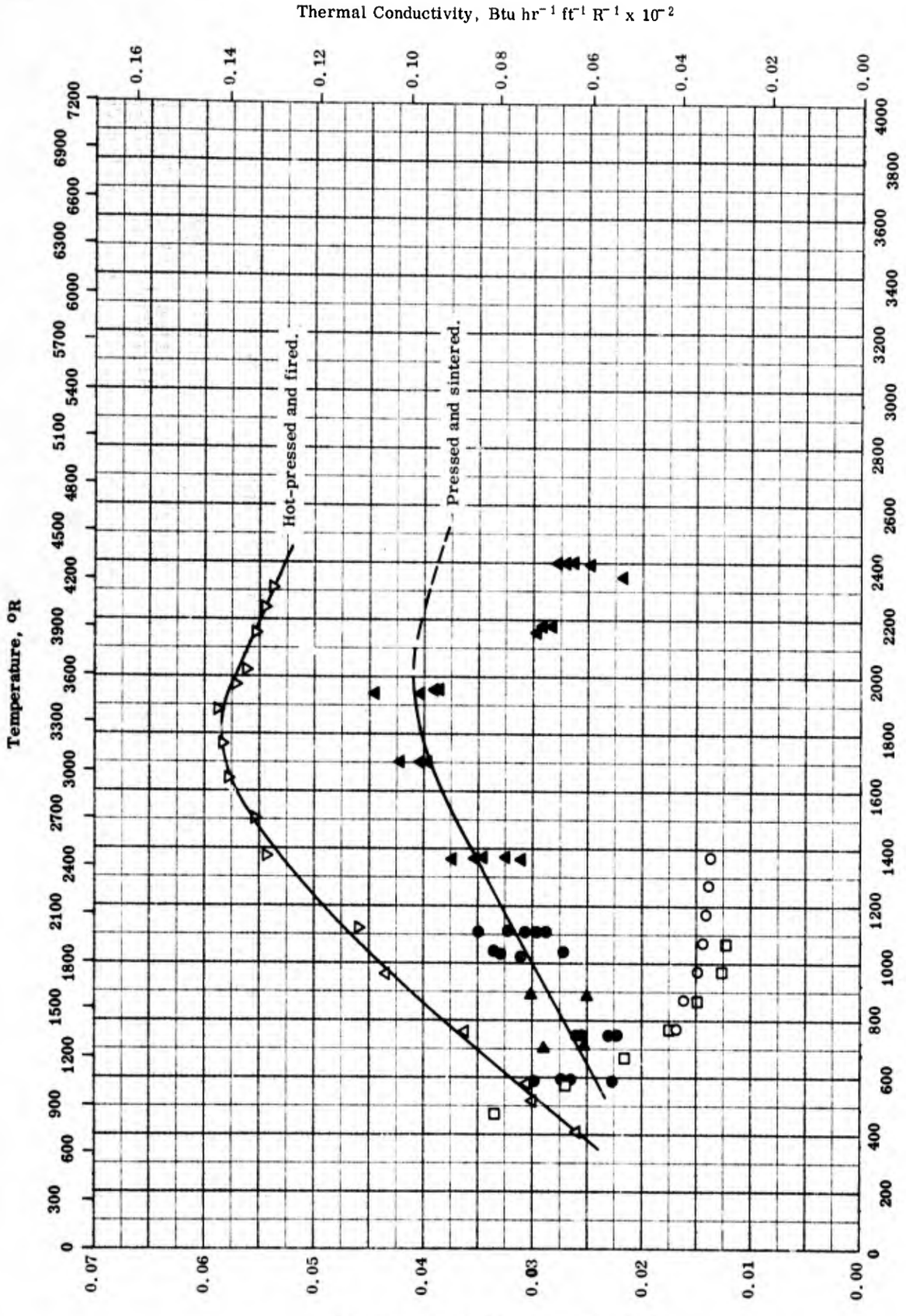


SPECIFIC HEAT -- ZIRCONIUM NITRIDE

SPECIFIC HEAT -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

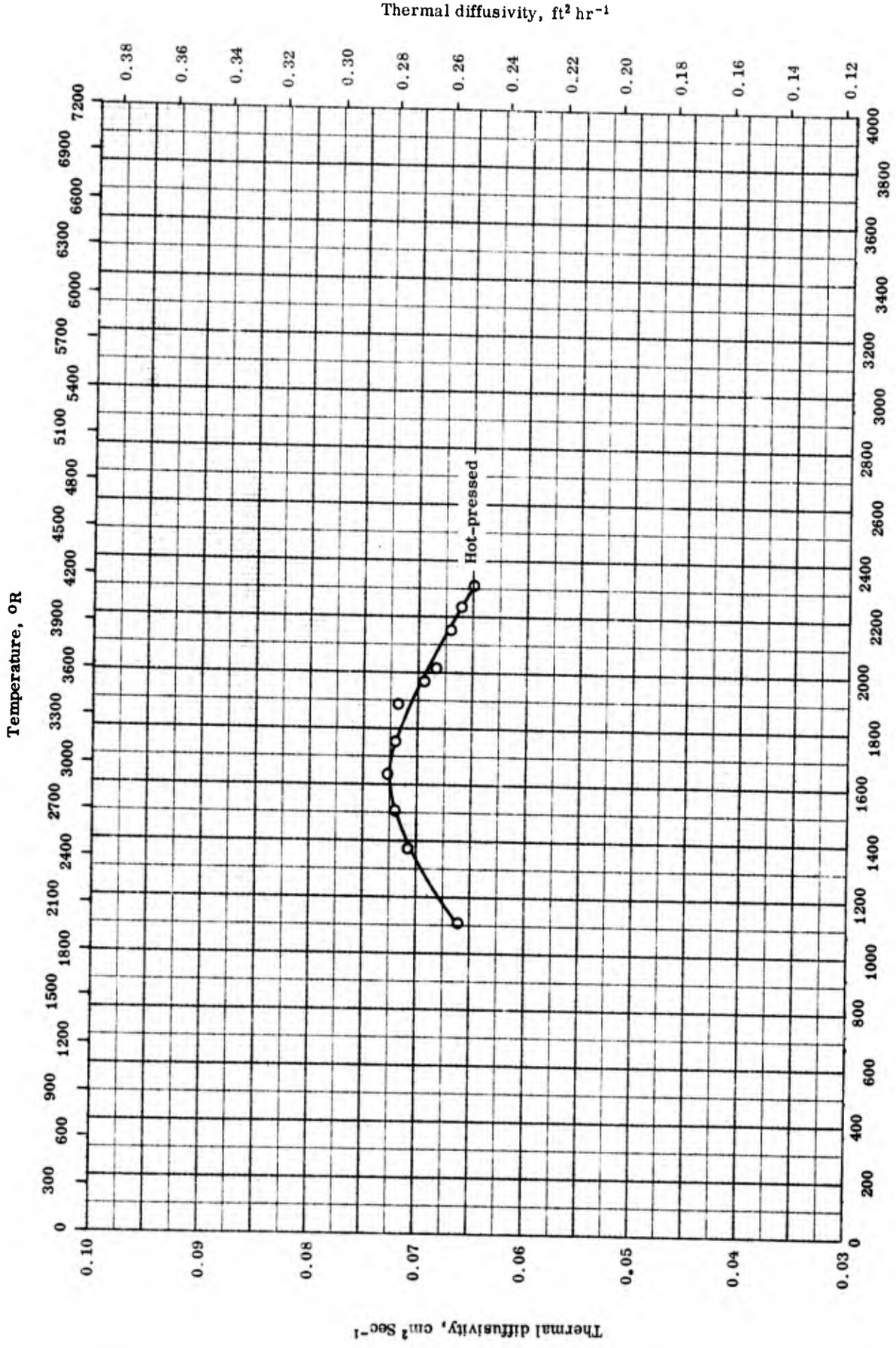
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-5	533-3033	≤5	ZrN; before test: 86.9 Zr, 12.8 N, and 0.1 Fe; density 450 lb ft^{-3}; after test: 86.5 Zn, 10.8 N and 1.19 C; density 437 lb ft^{-3}.	Pressed and sintered.
□	63-1	522-2770	±5	ZrN; 84.6 Zr, 13.5 N, 0.8 H, 0.5 alkali, 0.4 Si and 0.2 F_2.	Hot pressed.
▽	50-6	298-1700		ZrN; 86.75 Zr and 1.35 Hf.	



THERMAL CONDUCTIVITY -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	54-3	473-1073		81.8 Zr, 8.9 N_2 (cf, theor. 86 Zr, 13.3 N_2), 5.2 O_2, and 4.1 others; total porosity 19.3%.	Fired at 2000 C; dense sintered Al_2O_3 used as standard.
○	54-3	773-1373		Same as above except total porosity 19.6%.	Fired at 2000 C.
△	63-1	408-955	±4	ZrN; 84.6 Zr, 13.5 N, 0.8 H, 0.4 Si alkali, 0.2 Fe, and 0.5 metal oxides; density 406 lb ft^{-3}.	Hot-pressed and fired at 3940 F; surface ground; measured in He atm
▽	63-1	1116-2308	±4	Same as above.	The above sample measured by another method.
▶	62-5	704-889	2-4	ZrN; density 427 lb ft^{-3}.	Pressed and sintered; maximum exposure temperature 4810 F.
●	62-5	589-1113	2-4	Same as above.	Same as above.
▲	62-5	1361-2405	2-4	Same as above.	Same as above; sample found fractured after measurement.

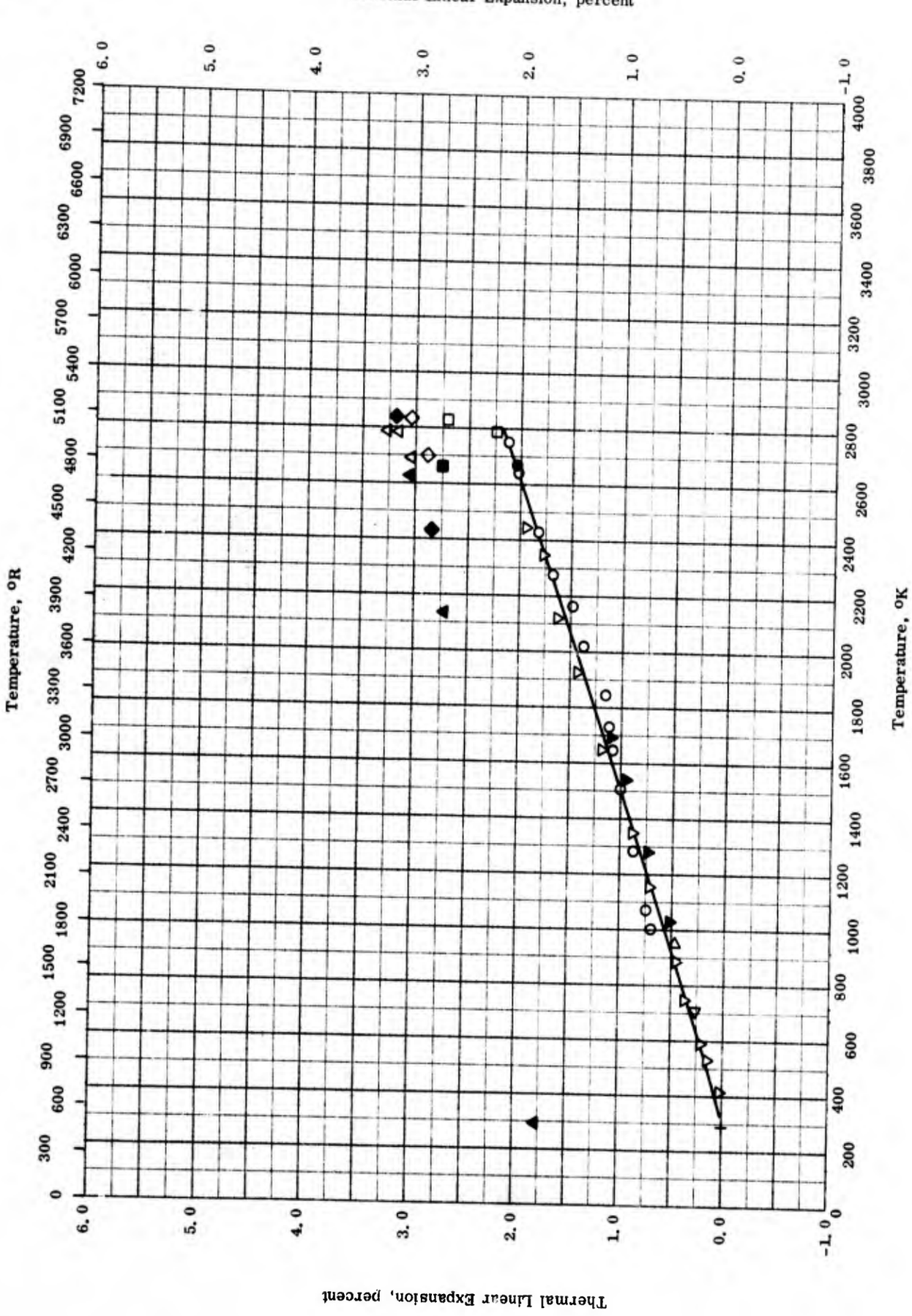


THERMAL DIFFUSIVITY -- ZIRCONIUM NITRIDE

THERMAL DIFFUSIVITY -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-1	1117-2308		84.6 Zr, 13.5 N, 0.8 H, 0.5 metal oxides, 0.4 Si alkali, and 0.2 Fe; density 406 lb ft^{-3}.	Hot pressed and fired at 3812 F.



THERMAL LINEAR EXPANSION -- ZIRCONIUM NITRIDES

Thermal Linear Expansion, percent

REFERENCE INFORMATION

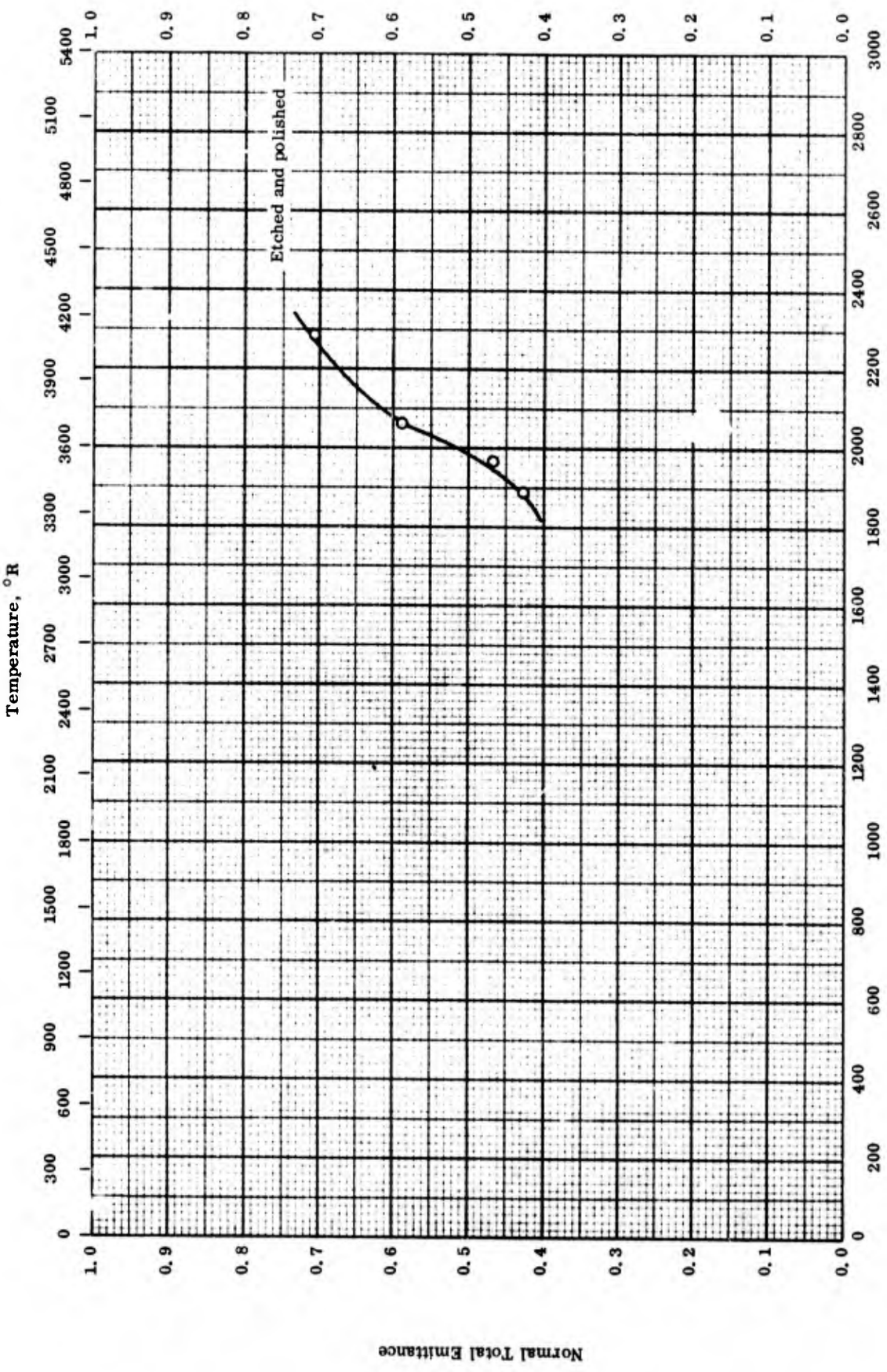
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▼	63-32	298-1699		$ZrN_{0.93}$; 85.76 Zr, 12.27 N, 1.50 O, 0.21 C, 0.2 Al, 0.2 Cr, 0.1 Fe, and 0.1 Si; total impurity 1.77; total analysis 99.80.	Prepared by pressing less than 325 mesh powder at 16,000 psi and heating in a flowing NH_3 atm at 1350 C for 2 hrs; data measured from (420) and (422).
○	62-5	294-2756	2	ZrN from General Electric Co.; before exposure 86.9 Zr, 12.8 N_2, and 0.1 Fe; after exposure 86.5 Zr, 10.8 N_2, and 1.19 C; density in g cm^{-3} at 25 C by ASTM method B311-58 before exposure 7.2, after exposure 6.8; initial length 2.9700 in. [Author's design : Run SRI-E24].	Pressed and sintered; measured in helium atm.
●	62-5	2667-2756	2	Same as above.	Cooling of above sample to 4340 F.
□	62-5	2667-2822	2	Same as above.	Reheating of above sample to 4620 F.
■	62-5	2661-2822	2	Same as above.	Recooling of above sample to 4330 F.
◇	62-5	2661-2836	2	Same as above.	Reheating of above sample to 4645 F.
◆	62-5	2433-2836	2	Same as above.	Recooling of above sample to 3920 F.
△	62-5	2433-2783	2	Same as above.	Final heating of above sample.
▲	62-5	294-2783	2	Same as above; final length 3.0333 in.	Final cooling for above sample; sample broken on post inspection.
▽	63-1	299-2443		ZrN, Norton Co.; 84.6 Zr, 13.5 N, 0.8 H, 0.4 Si, 0.2 Fe, and 0.5 alkali metal oxides; density 406 lb ft^{-3}; dimensions 1/2 in. diameter by 6 in. long.	Hot pressed and fired at 3812 F; measured in argon atm with heating rate of approx. 5 F min^{-1}.

(Continued onto next page)

THERMAL LINEAR EXPANSION -- ZIRCONIUM NITRIDE (continued)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	58-9	290-953		52.7 Zr, 47.2 N, and 0.05 Mg.	Prepared by heating about 10 g of Zr powder surrounded by a nitrogen atm. of low oxygen content for 4 hrs at 1250 C in an alumina boat; measured under a vacuum of the order of 1×10^{-4} mm Hg; x-ray method.
◁	57-18	293-953		87.4 Zr, 12.09 N, and 0.19 Mg (cf. theor. 86.7 Zr and 13.3 N).	Measured under vacuum of 10^{-4} mm Hg; x-ray diffraction method.

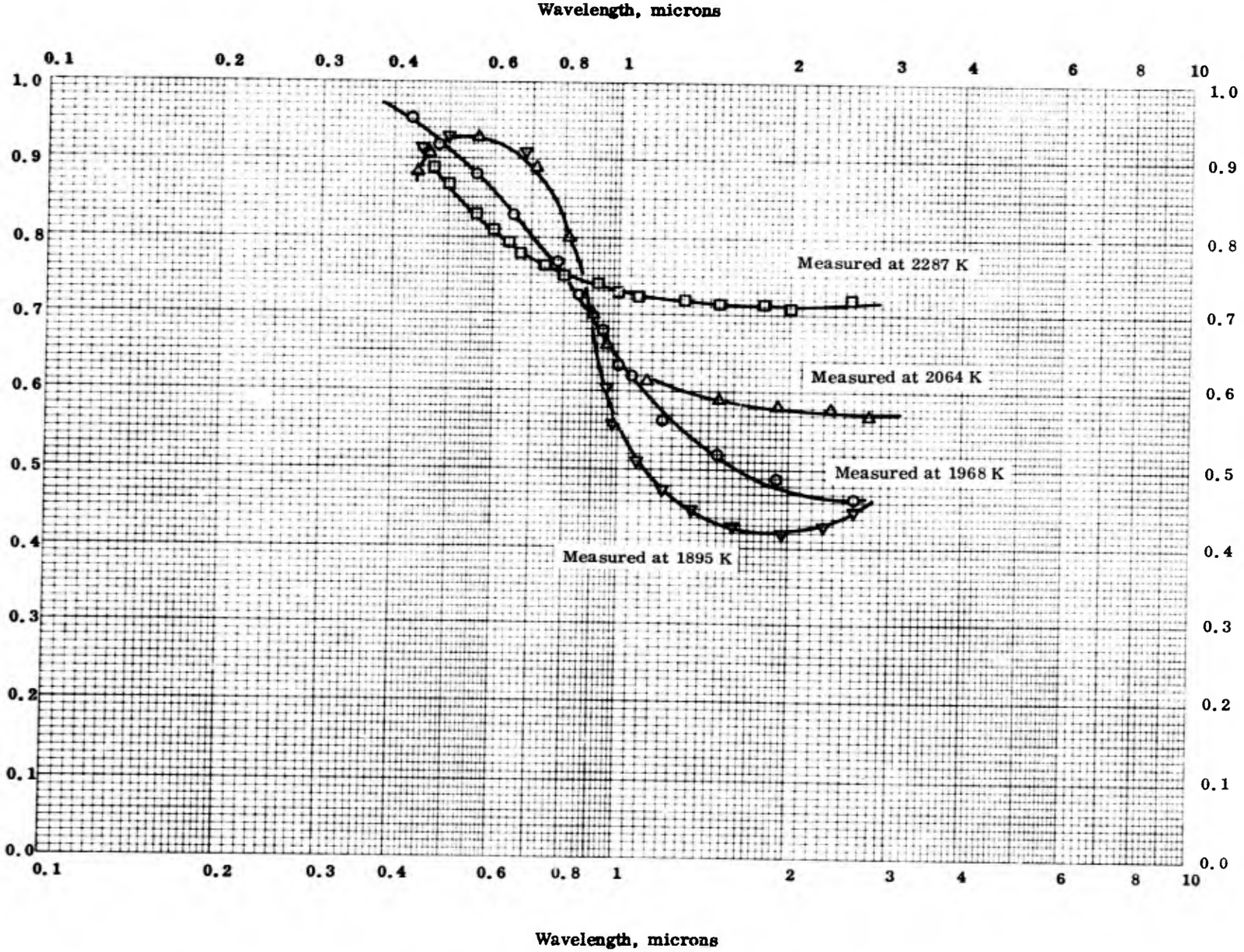


NORMAL TOTAL EMITTANCE -- ZIRCONIUM NITRIDE

NORMAL TOTAL EMITTANCE -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-1	1895-2287		ZrN, from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in argon atmosphere at 1.5 - 2.0 atm; computed from spectral data.

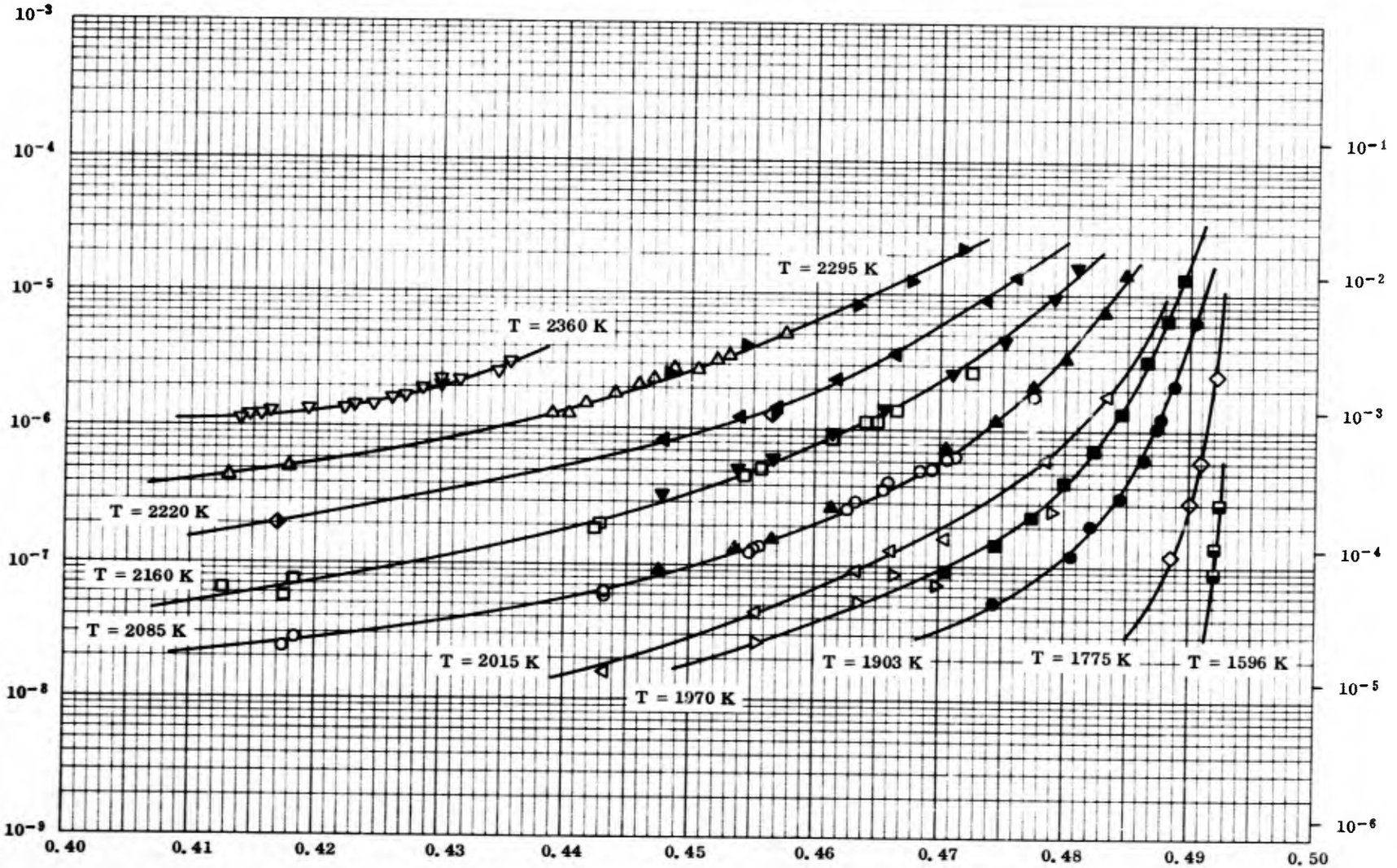


NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM NITRIDE

NORMAL SPECTRAL EMITTANCE -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	64-1	1968	0.43-2.60		ZrN, from finely divided powder.	Hot-pressed and sintered; etched and polished; measured in argon atmosphere at 1.5 - 2.0 atm.
□	64-1	2287	0.47-2.55		Same as above.	Same as above.
△	64-1	2064	0.44-2.75		Same as above.	Same as above.
▽	64-1	1895	0.45-2.60		Same as above.	Same as above.

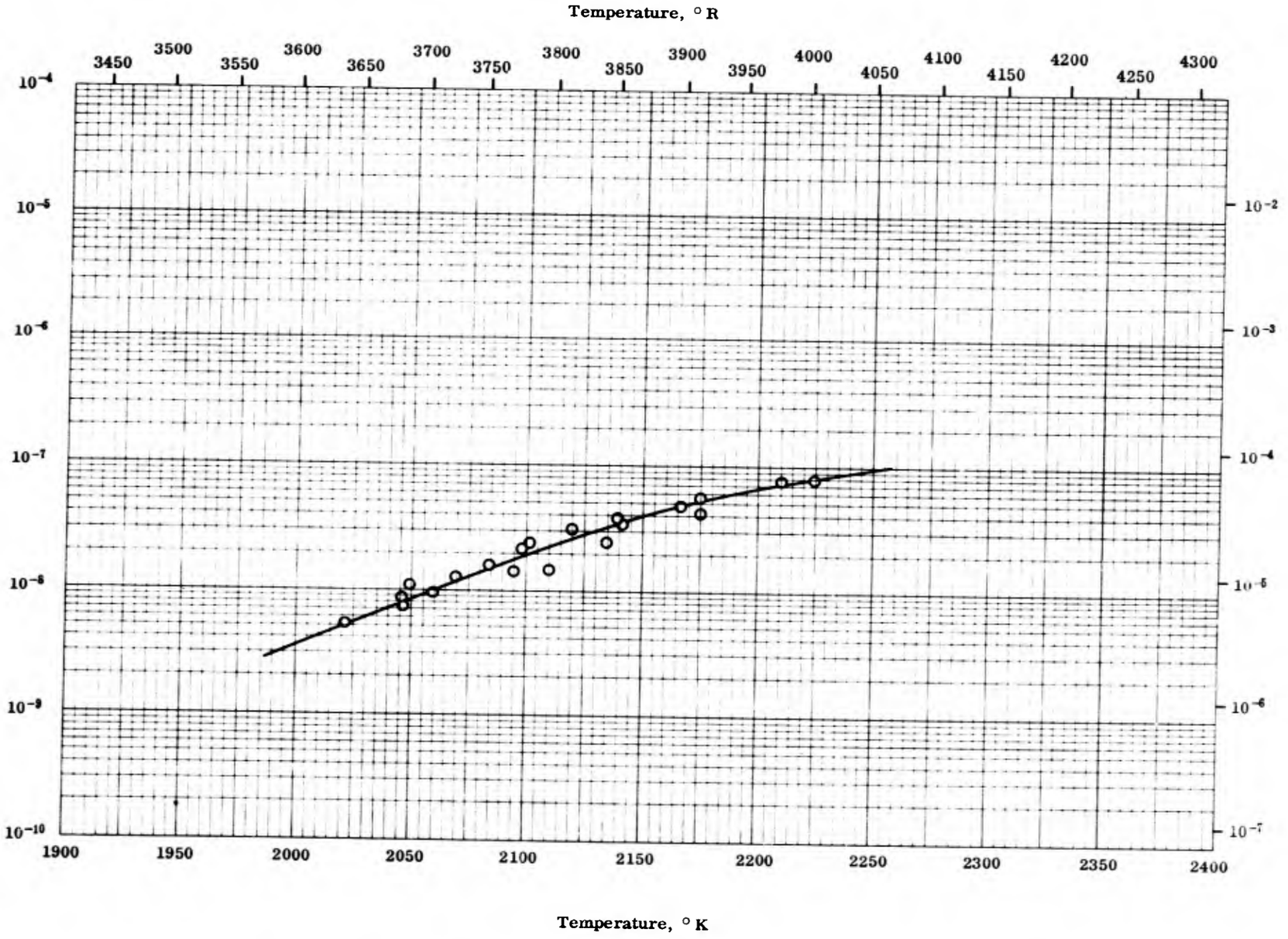


VAPOR PRESSURE -- ZIRCONIUM NITRIDE
(As a function of N in ZrN)

VAPOR PRESSURE -- ZIRCONIUM NITRIDE
(As a function of N in ZrN)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▷	64-1	1970		13.01 N initial and 9.74 N final.	Gas phase nitrogen; test series I.
◁	64-1	2015		Same as above.	Same as above.
○	64-1	2085		Same as above.	Same as above.
□	64-1	2160		Same as above.	Same as above.
◈	64-1	2220		Same as above.	Same as above.
△	64-1	2295		Same as above.	Same as above.
▽	64-1	2360		Same as above.	Same as above.
▬	64-1	1596		13.01 N initial and 11.07 N final.	Same as above; test series II.
◇	64-1	1775		Same as above.	Same as above.
●	64-1	1903		Same as above.	Same as above.
■	64-1	1970		Same as above.	Same as above.
▲	64-1	2085		Same as above.	Same as above.
▼	64-1	2160		Same as above.	Same as above.
◀	64-1	2220		Same as above.	Same as above.
▶	64-1	2295		Same as above.	Same as above.



TPRC

VAPOR PRESSURE -- ZIRCONIUM NITRIDE

VAPOR PRESSURE -- ZIRCONIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-1	2022-2224		8.31 N.	Nitrogen gas phase; test series VI.

PROPERTIES OF OTHER METAL NITRIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	LaN	6.845	427.1
	CeN	8.08	504.2
	NdN	7.70	480.5
	ScN	4.21	262.7
	YN	5.89	367.5
●	YN	5.60 ± 0.05	350 ± 3
□	YN	5.87 ± 0.02	367 ± 1
▽	Li_3N	2.366	147.9
◇	ThN	11.56	721.7

Melting Point		K	R
△	YN	2943^{+}	5300^{+}
◆	ThN	2903 ± 50	5226 ± 90
▲	Ba_3N_2	2493^{+}	4488^{+}
▼	CaN	2072	3730
■	Ca_3N_2	1468	2643
◑	Cr_2N	1923	3462
◨	CrN	1773	3192
▲	Fe_4N	943	1697
▲	Mn_4N	773 ± 100	1391 ± 180
▼	Mo_3N	873	1571
▼	Th_3N_4	2373	4272
◆	WN	873	1571

Heat of Fusion		Cal g^{-1}	Btu lb^{-1}
◆	Li_3N	88.76	159.8

Heat of Vaporization		Cal g^{-1}	Btu lb^{-1}
◆	Li_3N	1389	2500

PROPERTIES OF OTHER METAL NITRIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Rare earth nitrides.	
◇	52-7	298		ThN	Prepared by passing NH_3 over Th shavings; computed from x-ray measurement of lattice.
◆	52-7	2853–2953		ThN	Same as above; M.P. by visual observation.
□	57-27	296		YN; 87.0 Y, 10.5 N, 3.5 La, 0.17 > Tb, 0.1 > each Dy, Ho, 0.04 C, 0.05 > Ta, 0.03 ≥ each Si, Er, 0.02 > Tm, 0.01 each Fe, Al, 0.01 > each Mg, Ca, Cr, Ni, Cu, Yb, and 0.001 > each K, Mn, Pb, Na.	Powdered sample; measured in pycnometer in xylene.
△	57-27	2943		Same as above.	By visual observation under N_2.
▲	51-10	>2493		Ba_3N_2	Sublimation point.
▼	60-8	2072		CaN	
■	52-10	1468		Ca_3N_2	
◑	62-48	1923		Cr_2N	
◨	57-28	1773		CrN	
◭	57-28	673-873		Mn_4N	Decomp. temperature.
◈	57-28	873		W N	Same as above.
◭	50-14	943		Fe_4N	
▼	30-1	873		Mo_3N	Decomp. temperature
▼	50-13	2373		Th_3N_4	

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REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▽	61-21	293		Li_3N	
◆	61-21	298		Li_3N	
◆	61-21	293		Li_3N	

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PHOSPHIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple phosphorous compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.

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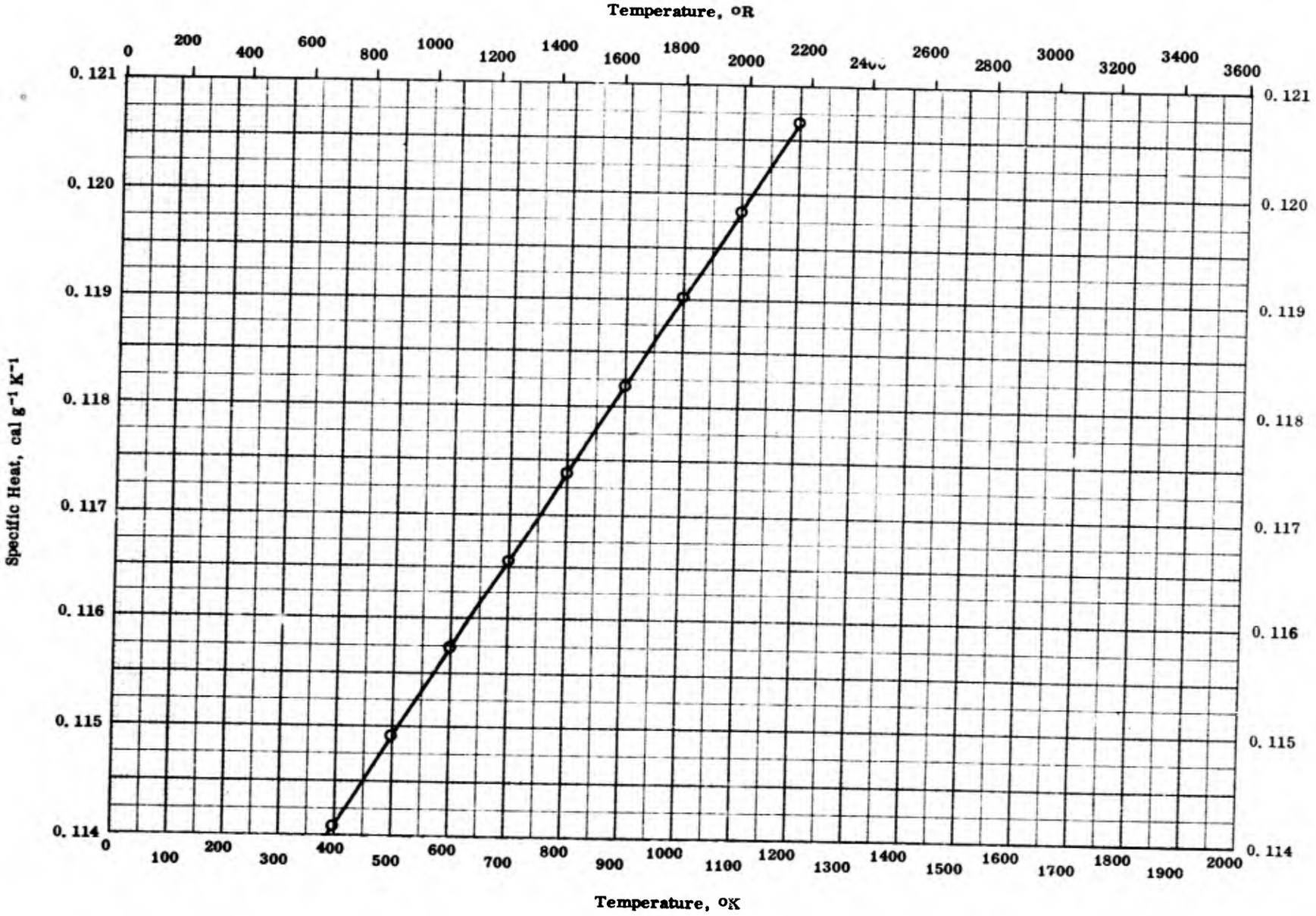
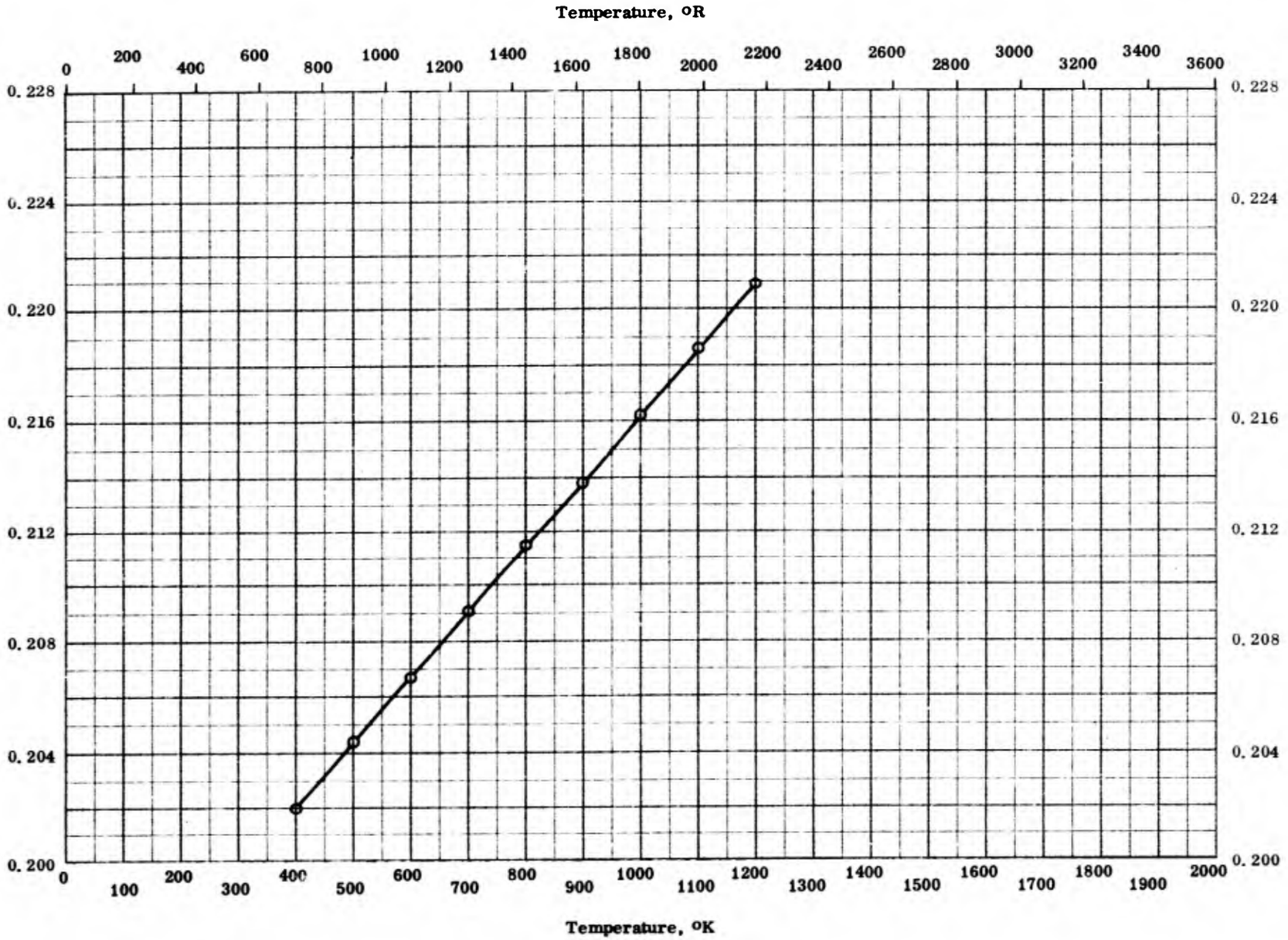


SPECIFIC HEAT -- ALUMINUM PHOSPHIDE

SPECIFIC HEAT -- ALUMINUM PHOSPHIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-14	400-1200		AlP; 99.99 pure.	

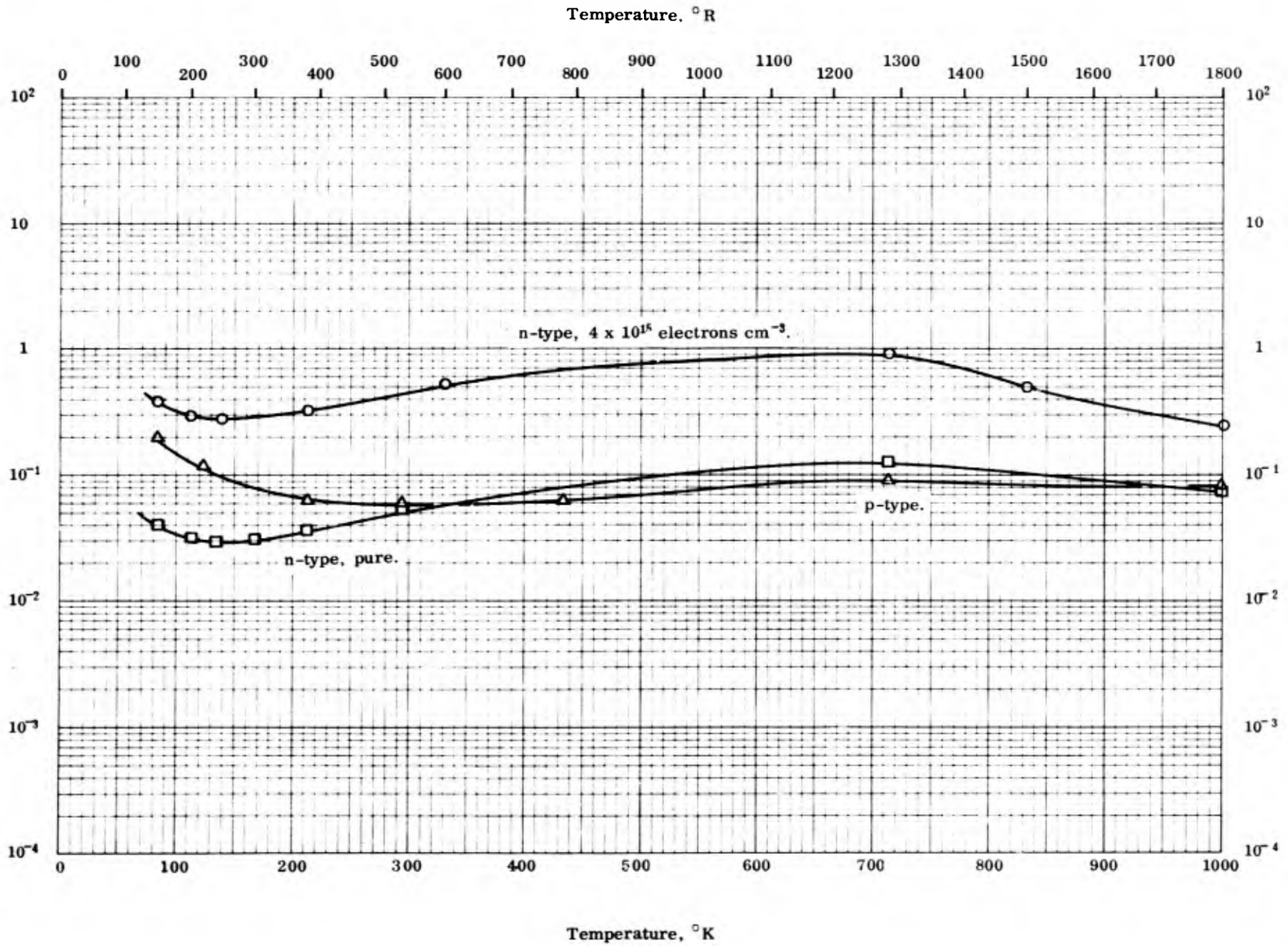


SPECIFIC HEAT -- GALLIUM PHOSPHIDE

SPECIFIC HEAT -- GALLIUM PHOSPHIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-14	400-1200		GaP; 99.99 pure.	

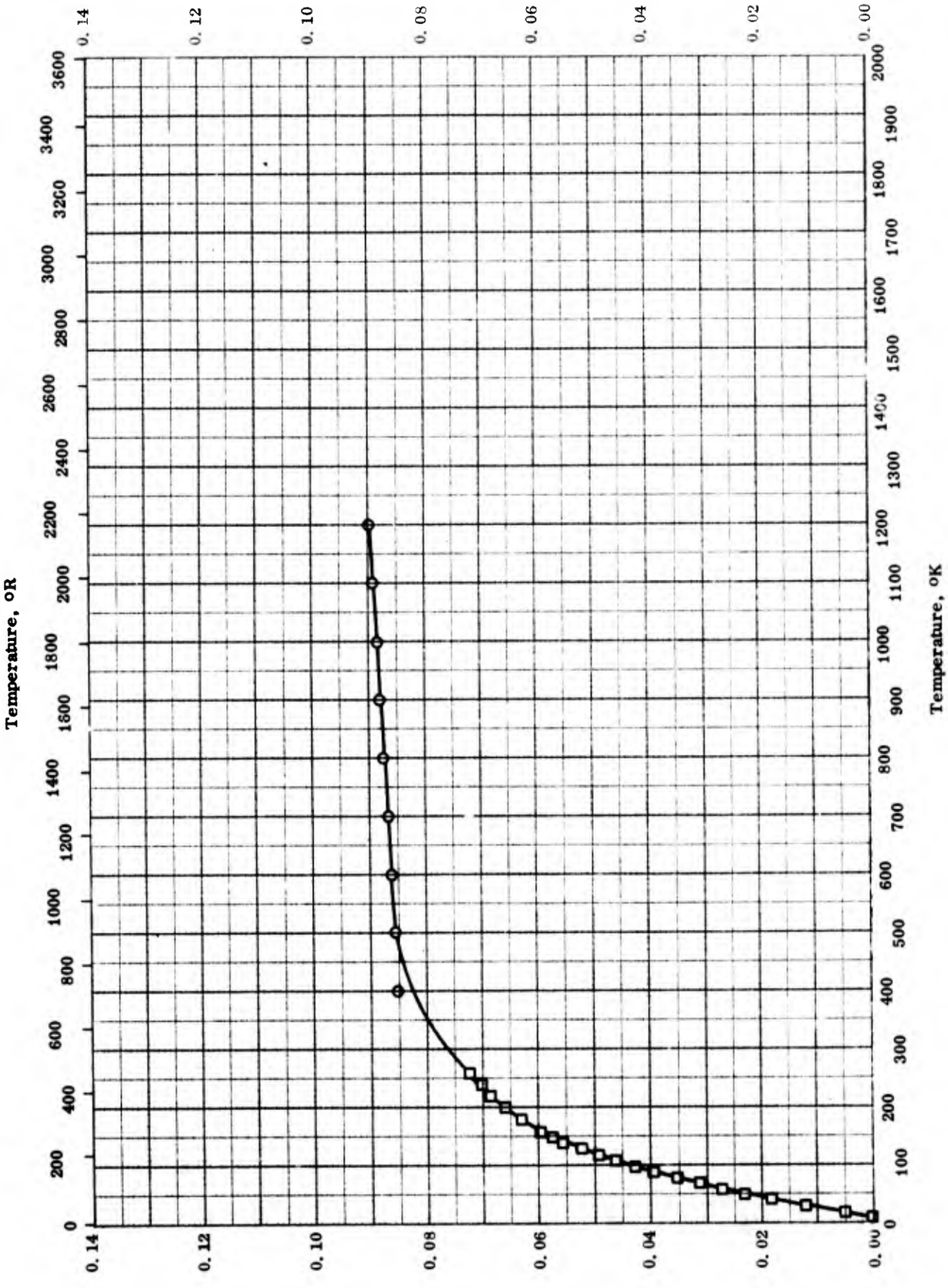


ELECTRICAL RESISTIVITY -- INDIUM PHOSPHIDE

ELECTRICAL RESISTIVITY -- INDIUM PHOSPHIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-15	83-1000		n-type InP with 4×10^{15} electrons cm^{-3}. [Author's design.: A_n]	
□	62-15	83-1000		n-type InP. [Author's design.: B_n]	
△	62-15	83-1000		p-type. [Author's design.: 1_p]	Prepared by diffusion of zinc into the above sample designated as A_n.



SPECIFIC HEAT -- INDIUM PHOSPHIDE

SPECIFIC HEAT -- INDIUM PHOSPHIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-14	400-1200		InP; 99.99 pure	
□	63-15	12-273	≤2.0	Not given.	

PROPERTIES OF MISCELLANEOUS PHOSPHIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	LaP	5.22	325.7
	CeP	5.56	346.9
	PrP	5.72	356.9
	NdP	5.94	370.7
	SmP	6.34	395.6
□	VP	4.98	310.8
△	WP	12.0	748.8
▽	TiP	4.08	254.6
◇	β-TaP	10.9	680.2
●	β-NbP	6.48	404.4
■	MoP	7.33	457.4
▲	MnP	5.60	349.4
▼	CrP	5.35	333.8

Melting Point		K	R
◆	Ba_3P_2	3353	6036
◑	BP	≈1523	≈2742
◐	BP	1403*	2526*
◒	CrP	1873	3372
◒	Co_2P	1659	2986
◧	Fe_2P	1638	2949
◧	Fe_3P	≈1473	≈2652
◓	MnP	1420*	2556*
◓	MnP	1373	2472
◪	Mn_3P_2	1473	2652
◪	Mn_2P	1600	2880
◪	Mn_3P	1503	2706
◪	MoP	1753	3156
▲	Ni_2P	1373	2472
▲	$Ni_{12}P_5$	1388	2499
▼	Ni_3P	1373	2472
▼	NbP	2003	3606
◆	ReP	1473	2652

*Most probable value for this compound.

(Continued onto next page)

PROPERTIES OF MISCELLANEOUS PHOSPHIDES (Continued)

REPORTED VALUES

Melting Point	K	R
◆ TaP	1933	3480
◆ TiP	1853	3336
◆ WP	1723	3102
◆ VP	1593	2868

PROPERTIES OF MISCELLANEOUS PHOSPHIDES

REFERENCE INFORMATION

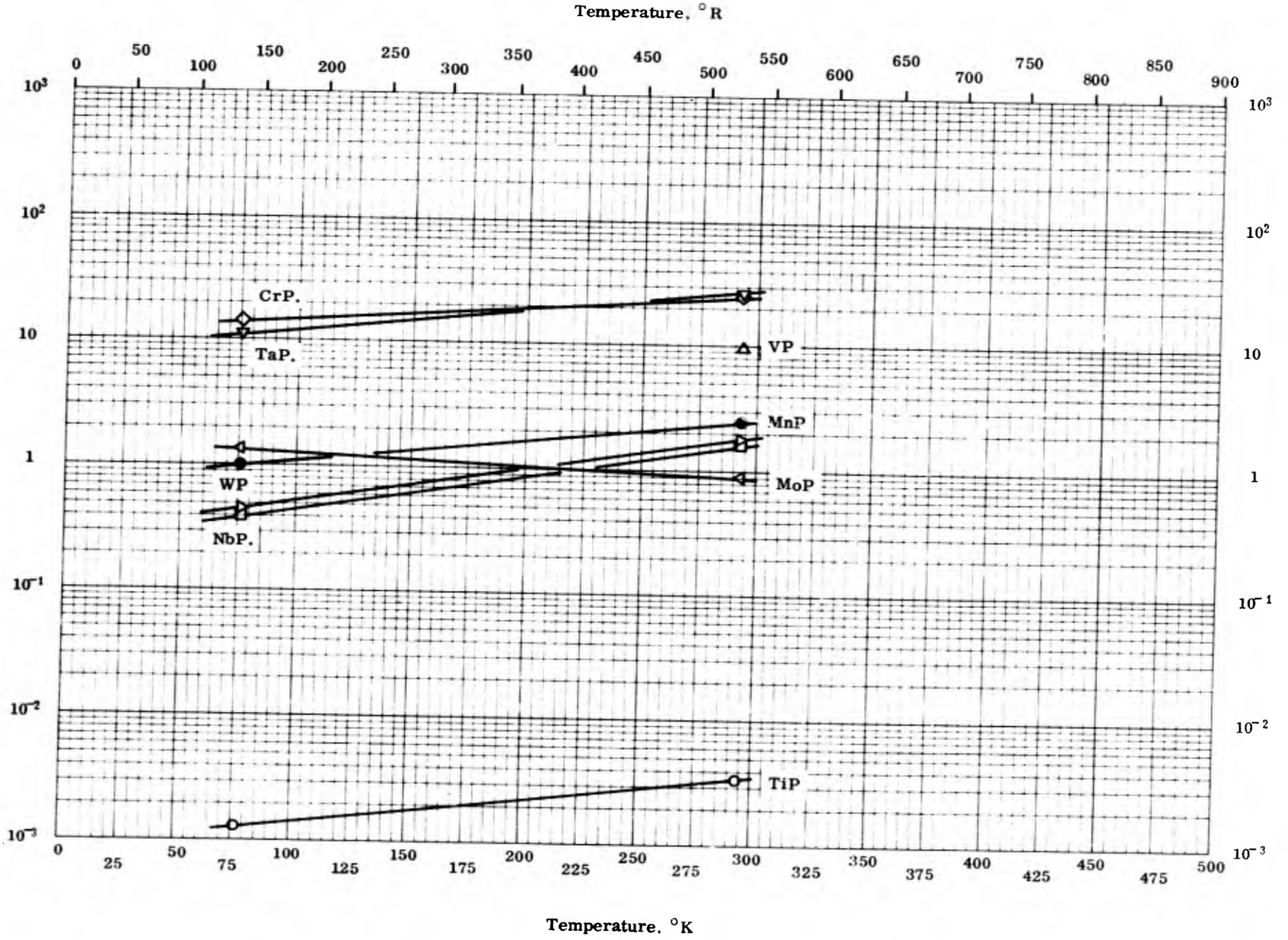
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Phosphites of rare earth metals.	
□	62-13	298		VP; 60.4 V and 38.8 P.	Made by reaction of metal chloride with calcium phosphite at elevated temperatures.
△	62-13	298		WP; 85.6 W and 14.2 P.	Same as above.
▽	62-13	298		TiP; 60.4 Ti and 37.6 P.	Same as above.
◇	62-13	298		β-TaP; 85.3 Ta and 14.1 P.	Same as above.
●	62-13	298		β-NbP; 74.4 Ta and 24.9 P.	Same as above.
■	62-13	298		MoP; 75.5 Mo and 24.4 P.	Same as above.
▲	62-13	298		MnP; 60.8 Mn and 37.8 P.	Same as above.
▼	62-13	298		CrP; 62.2 Cr and 36.6 P.	Same as above.
◆	58-10	3353		Ba_3P_2.	
◑	61-26	≈1523		BP.	Measured under presence of P.
◐	64-20	1403		BP.	Decomp. under normal pressure.
◒	61-26	1873		CrP.	Decomp. at 1633 K.
◓	61-26	1659		Co_2P.	
◨	61-26	1638		Fe_2P.	
◧	61-26	≈1473		Fe_3P.	Decomp. temperature.
◓	61-26	1420		MnP.	

(Continued onto next page)

PROPERTIES OF MISCELLANEOUS PHOSPHIDES (Continued)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
▬	63-35	1373		MnP.	Decomp. temperature.
◪	61-26	1473		Mn_3P_2.	
◩	61-26	1600		Mn_2P.	
◧	61-26	1503		Mn_3P.	
◨	63-35	1753		MoP.	Decomp. temperature.
▲	61-26	1373		Ni_2P.	
▲	61-26	1388		$Ni_{12}P_5$.	
▼	61-26	1373		Ni_3P.	
▼	63-35	2003		NbP in β phase.	
◆	61-26	1473		ReP.	
◆	63-35	1933		TaP.	Decomp. temperature.
◆	63-35	1853		TiP.	Same as above.
◆	63-35	1723		WP.	
◆	63-35	1593		VP.	Decomp. temperature.


Temperature, °R
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
Electrical Resistivity, ohm cm
10^3
10^2
10
1
10^{-1}
10^{-2}
10^{-3}
CrP.
TaP.
VP
MnP
WP
MoP
NbP.
TiP
0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
375
400
425
450
475
500
Temperature, °K
Electrical Resistivity, ohm cm

ELECTRICAL RESISTIVITY -- MISCELLANEOUS PHOSPHIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-13	76-293		TiP; 60.4 Ti and 37.6 P; compact density 64% theoretical.	Sintered at 1575 C; data not highly accurate.
△	62-13	293		VP; 60.4 V and 38.8 P; compact density 60% theoretical.	Sintered at 1225 C; data not highly accurate.
□	62-13	76-293		NbP; 74.4 Nb and 24.9 P; compact density 65% theoretical.	Sintered at 1730 C; data not highly accurate.
▽	62-13	76-293		TaP; 85.3 Ta and 14.1 P; compact density 69% theoretical.	Sintered at 1660 C; data not highly accurate.
◇	62-13	76-293		CrP ; 62.2 Cr and 36.6 P; compact density 66% theoretical.	Sintered at 1380 C; data not highly accurate.
◁	62-13	76-293		MoP ; 75.5 Mo and 24.4 P; compact density 53% theoretical.	Sintered at 1475 C; data not highly accurate.
▷	62-13	76-293		WP; 85.6 W and 14.2 P; compact density 57% theoretical.	Sintered at 1450 C; data not highly accurate.
●	62-13	76-293		MnP; 60.8 Mn and 37.8 P; compact density 78% theoretical.	Sintered at 1075 C; data not highly accurate.

SULFIDES AND THEIR MIXTURES

NOTE: For purposes of classification, simple sulfur compounds and their mixtures are specified as follows:

1. For simple compounds, the limit of impurities is ≤ 2.0 percent for each foreign constituent and ≤ 5.0 percent total impurities.
2. For mixtures of simple compounds, the major constituent is < 95.0 percent, or any other constituent is > 2.0 percent.

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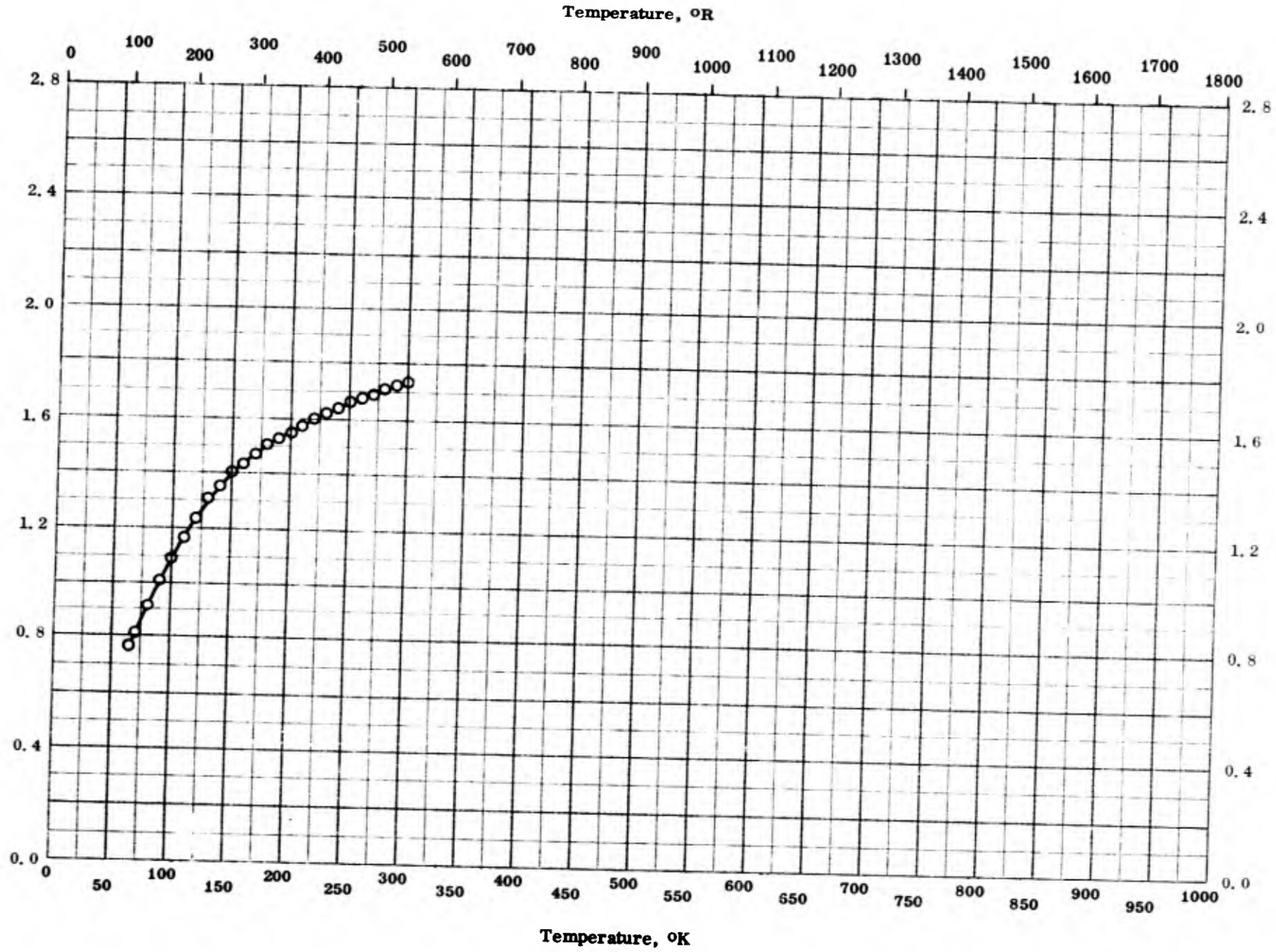
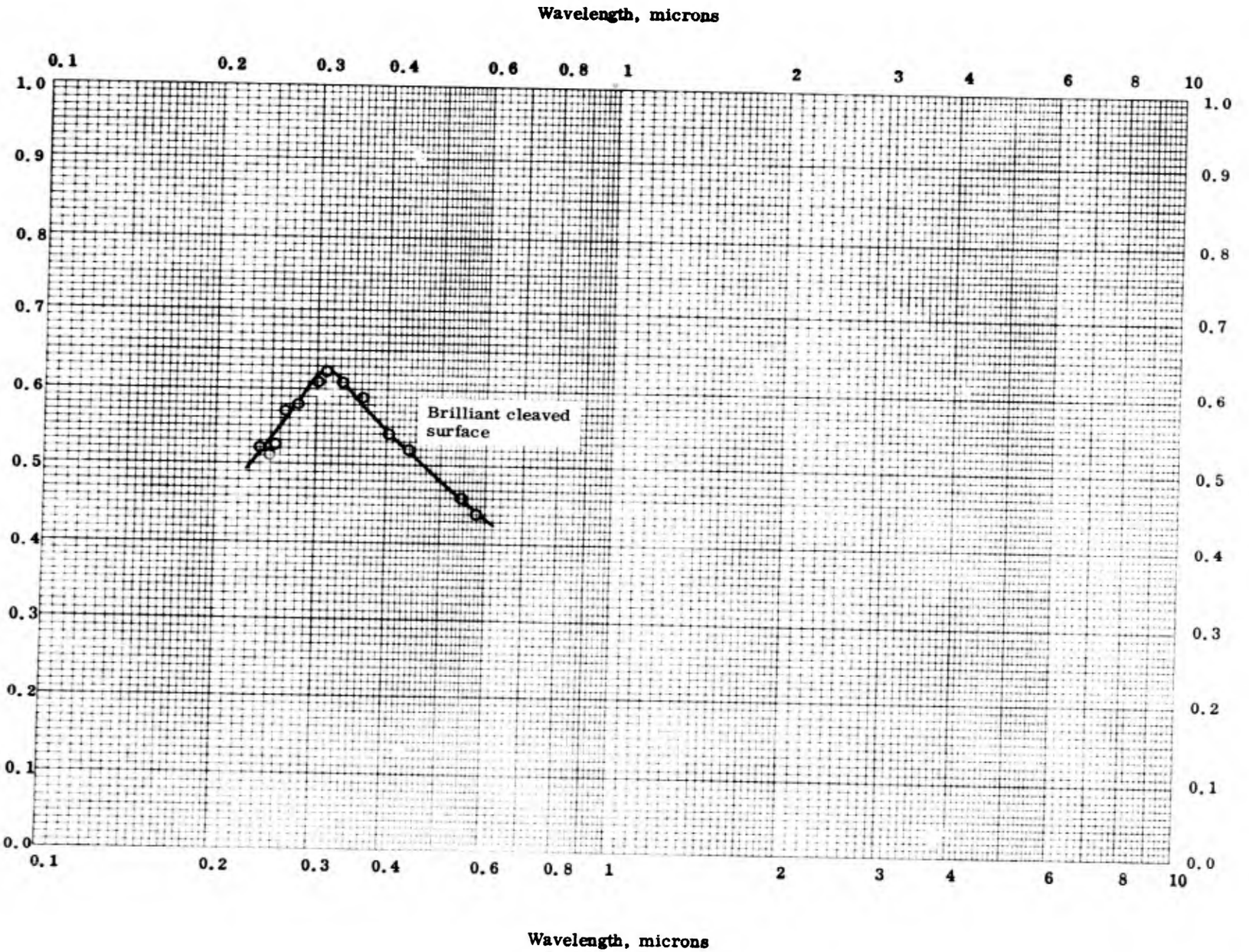


SPECIFIC HEAT -- ANTIMONY TRISULFIDE

SPECIFIC HEAT -- ANTIMONY TRISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-19 also 62-33	65-300		Sb_2S_3.	

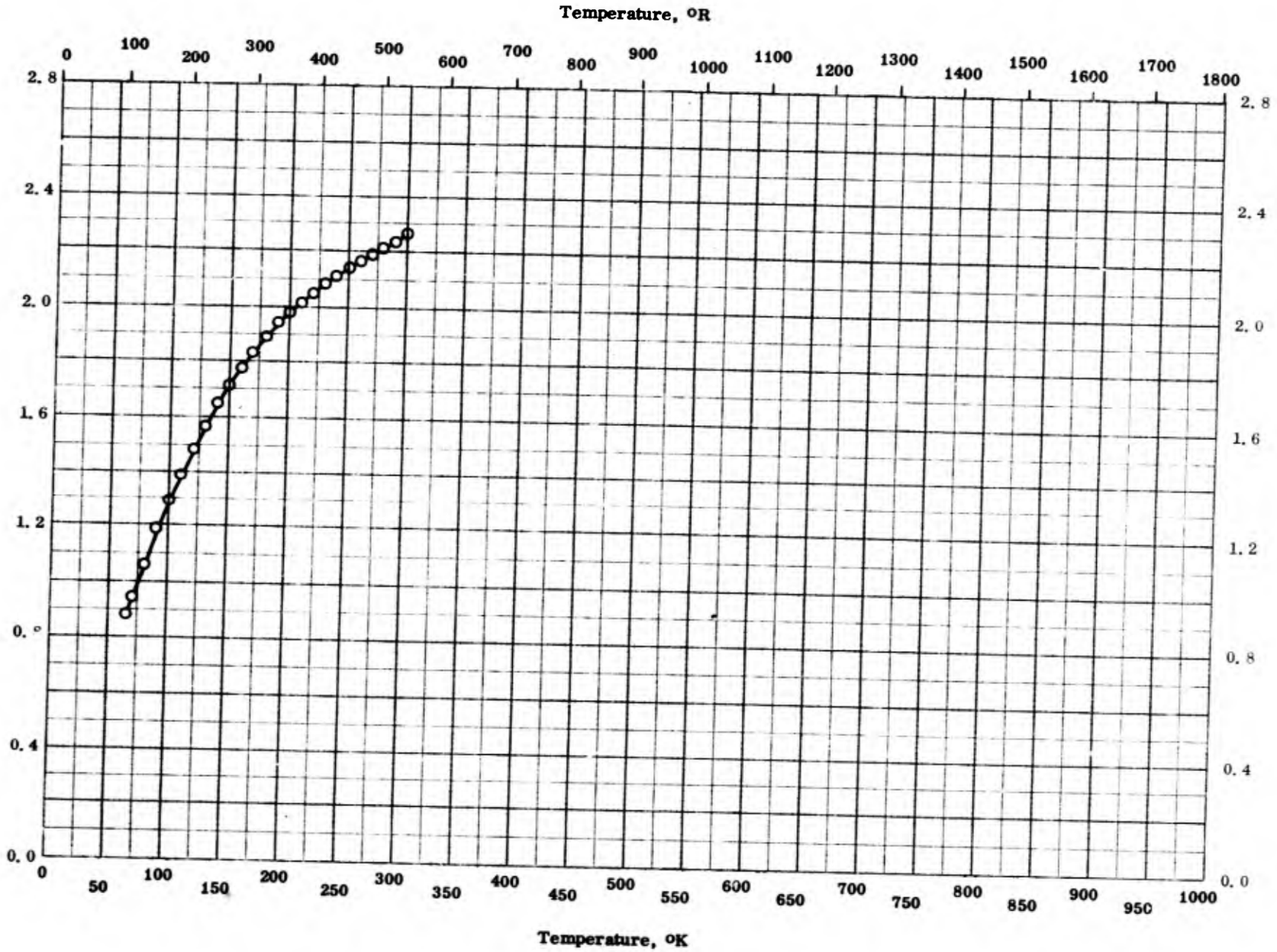


NORMAL SPECTRAL REFLECTANCE -- ANTIMONY TRISULFIDE

NORMAL SPECTRAL REFLECTANCE -- ANTIMONY TRISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	24-1	298	0.24-0.58		Sb_2S_3, stribnite.	Unusually brilliant cleaved surface, optically flat.



SPECIFIC HEAT -- ARSENIC TRISULFIDE

SPECIFIC HEAT -- ARSENIC TRISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-19 also 62-33	65-300		As_2S_3.	

PROPERTIES OF BARIUM MONOSULFIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	4.25*	265.2*
Melting Point.	2478	4461

*Handbook of Chemistry and Physics (Ref. 64-18)

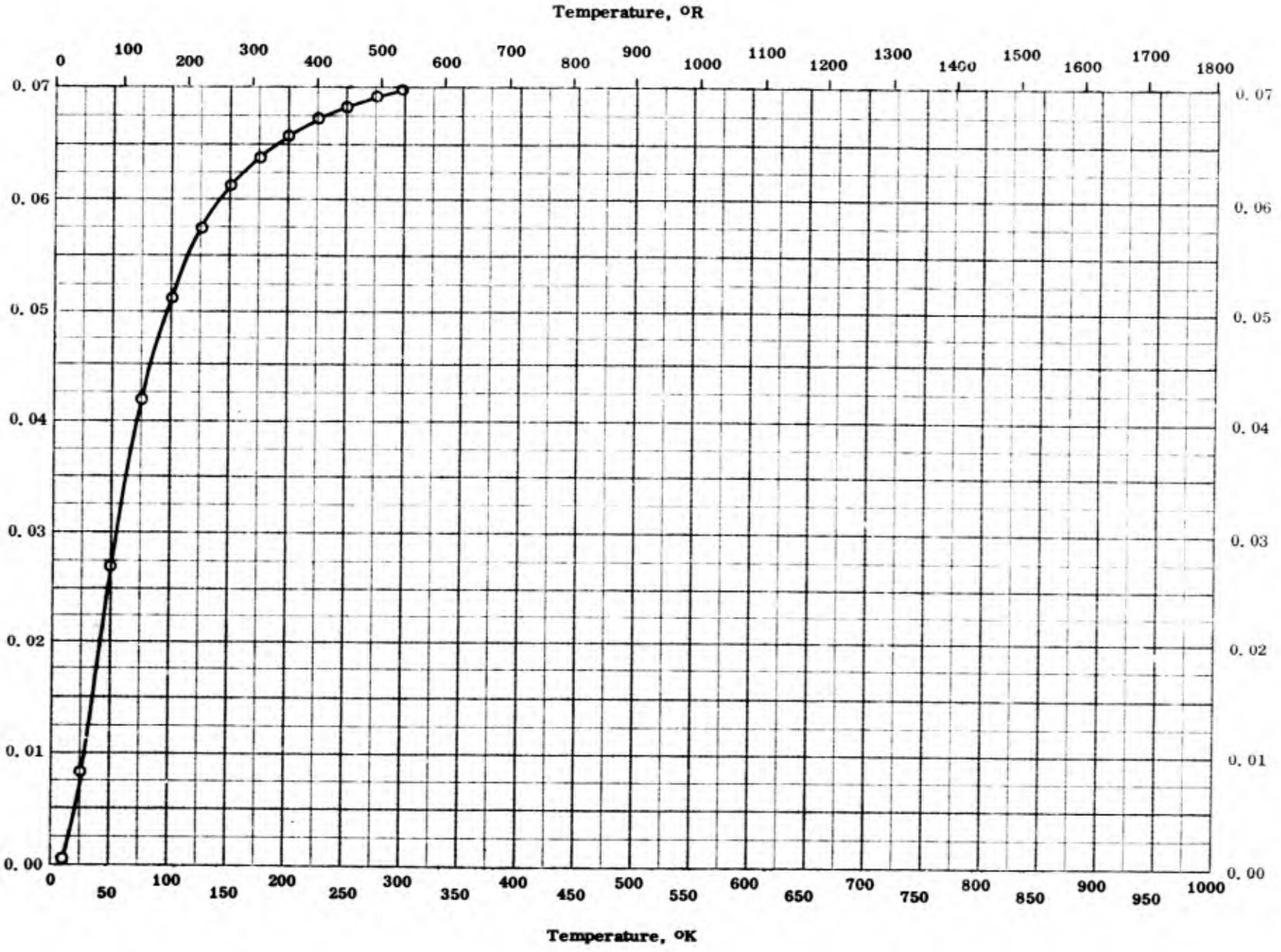
REPORTED VALUES

Melting Point	K	R
○	2478	4461
□	>2473	>4452

PROPERTIES OF BARIUM MONOSULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	58-10	2478		BaS	
□	48-1	>2473		BaS	



SPECIFIC HEAT -- BARIUM MONOSULFIDE

SPECIFIC HEAT -- BARIUM MONOSULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-20	50-298		99.53 BaS, 0.22 $BaSO_4$, and 0.04 SiO_2.	Prepared from reagent grade $BaSO_4$; ignites at 850 C and reduced by hydrogen at 1000 C.

PROPERTIES OF BERYLLIUM SULFIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	4.2	260
Melting Point	2473	4452

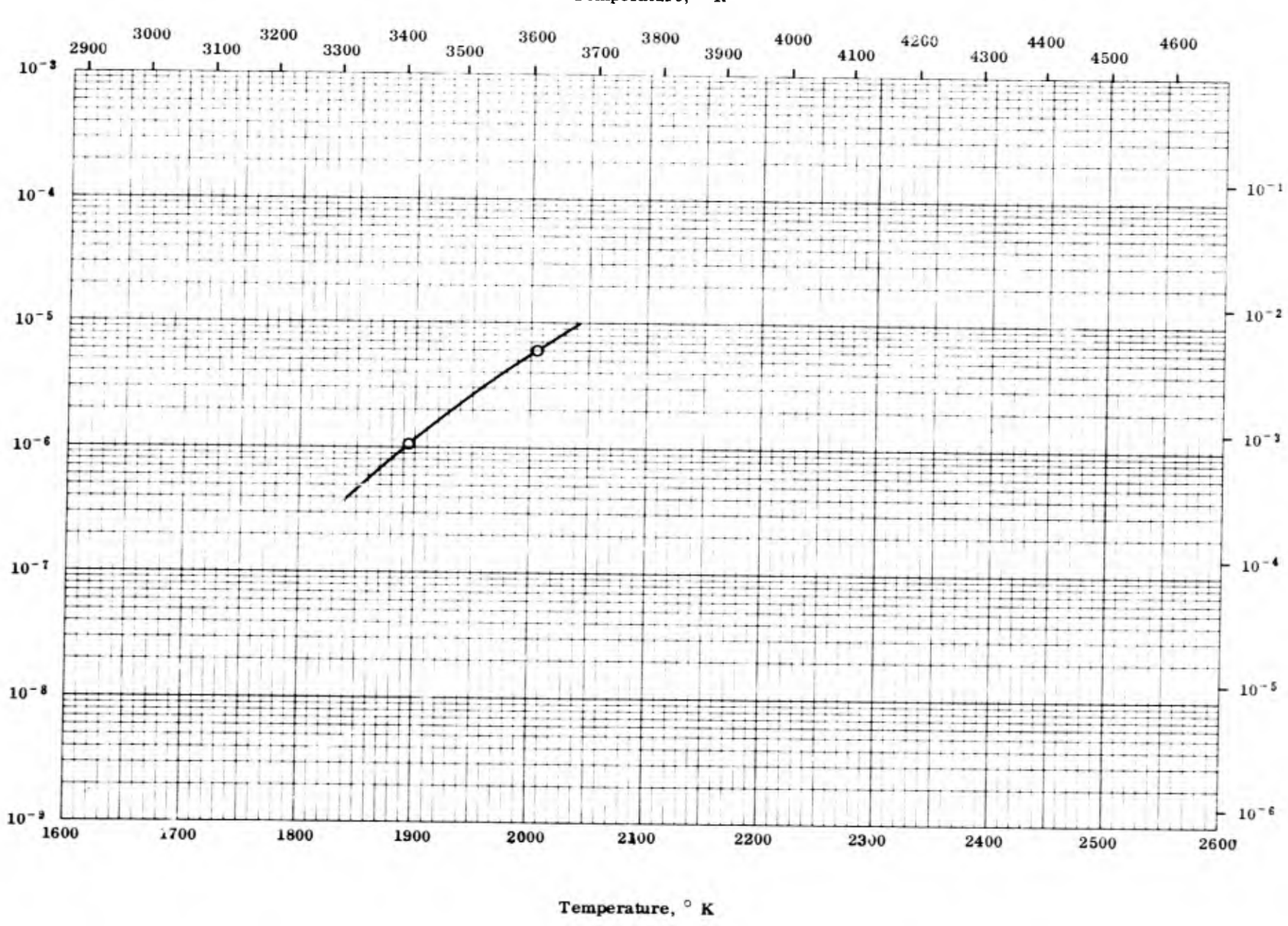
REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
	○	4.2	260
Melting Point		K	R
	□	2473^{+}	4452^{+}

PROPERTIES OF BERYLLIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	48-1	298		Pure BeS; white sample.	
□	48-1	2473		Pure BeS; white sample.	

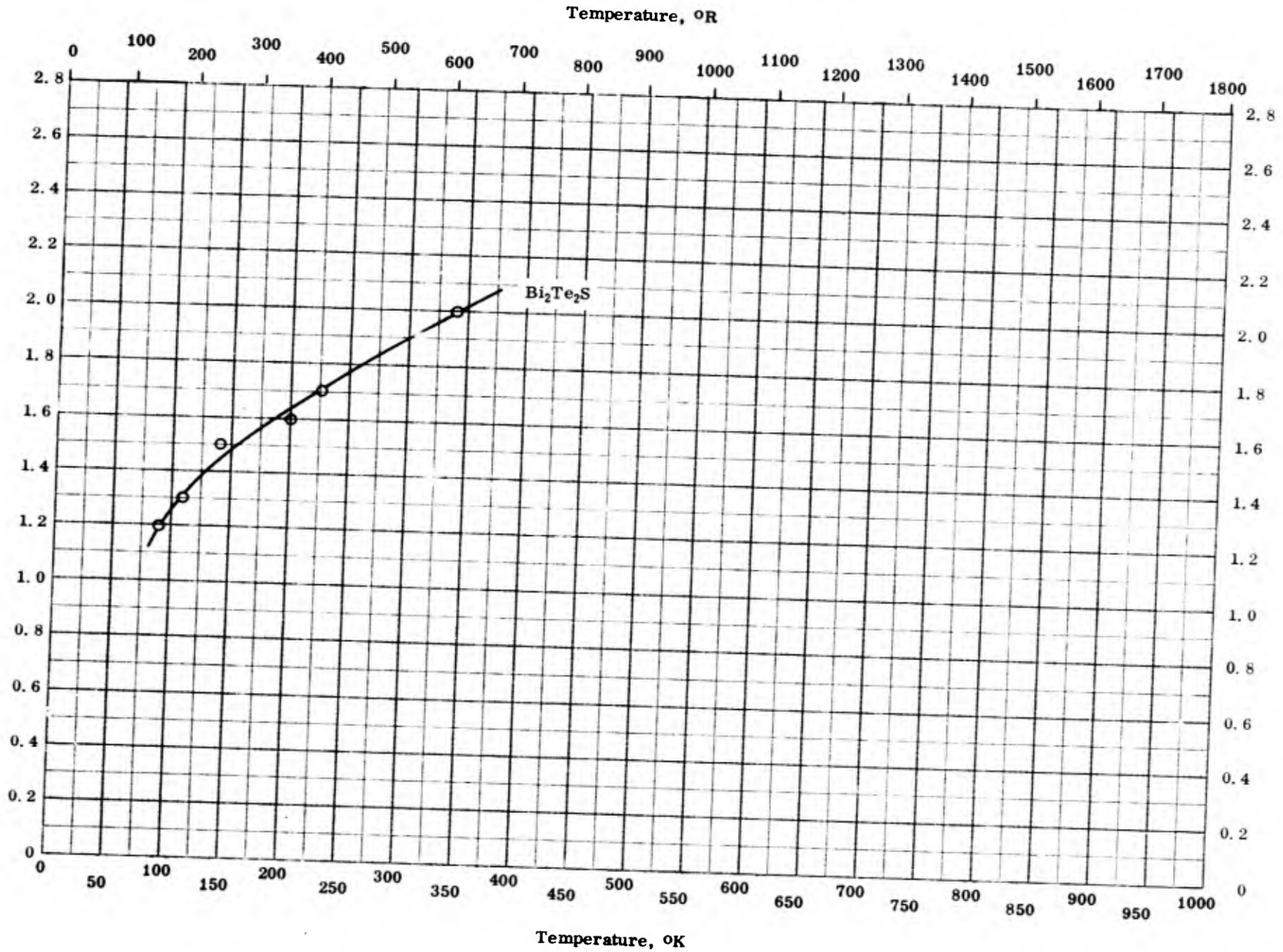


VAPOR PRESSURE -- BERYLLIUM SULFIDE

VAPOR PRESSURE -- BERYLLIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	48-1	1893-2003		Pure BeS: density 4.2 g cm^{-3}.	Approximate measurement; authors also report some data for ThS.

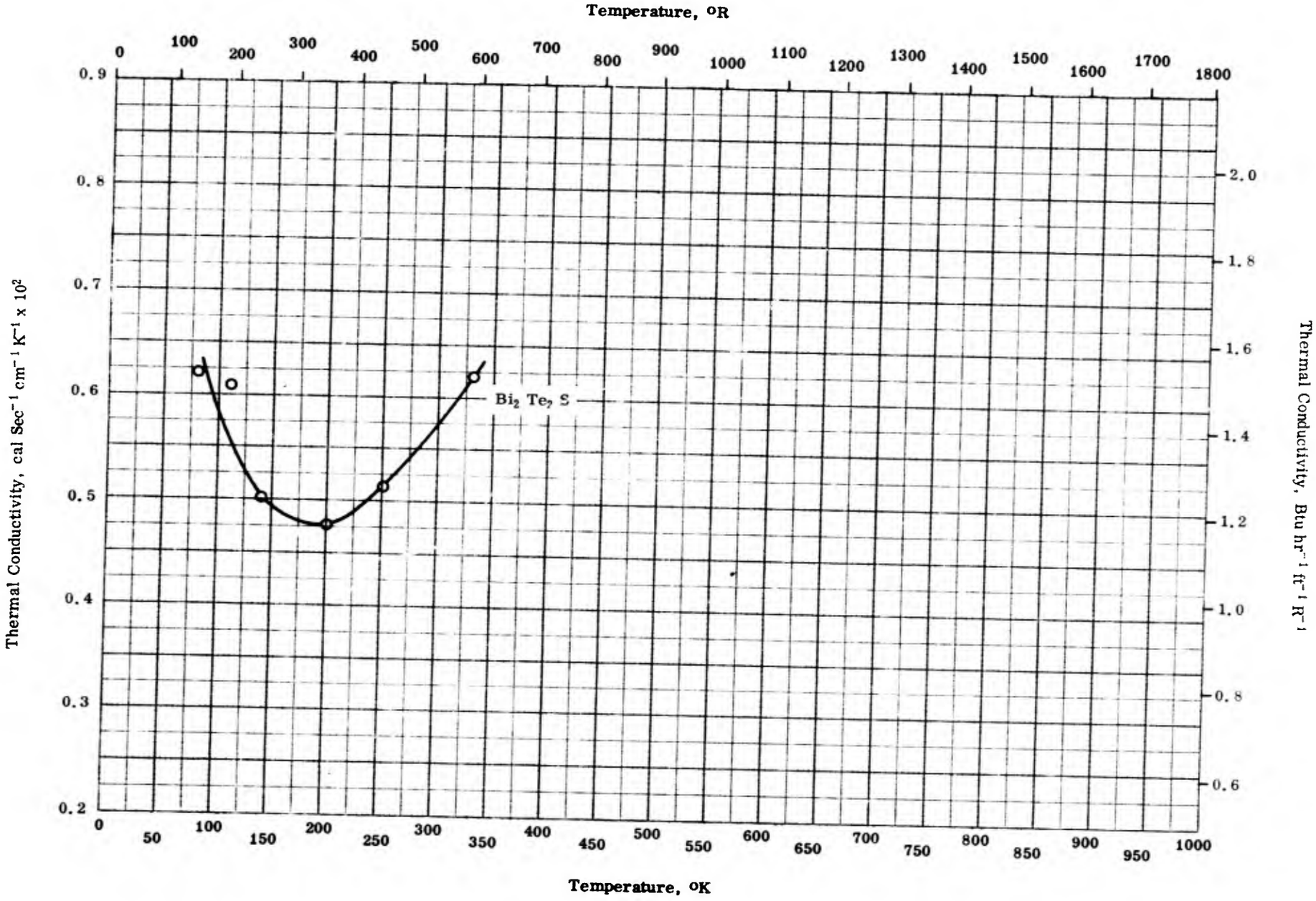


ELECTRICAL RESISTIVITY -- BISMUTH TELLURIUM SULFIDE

ELECTRICAL RESISTIVITY -- BISMUTH TELLURIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-2	90-340		Bi_2Te_2S.	

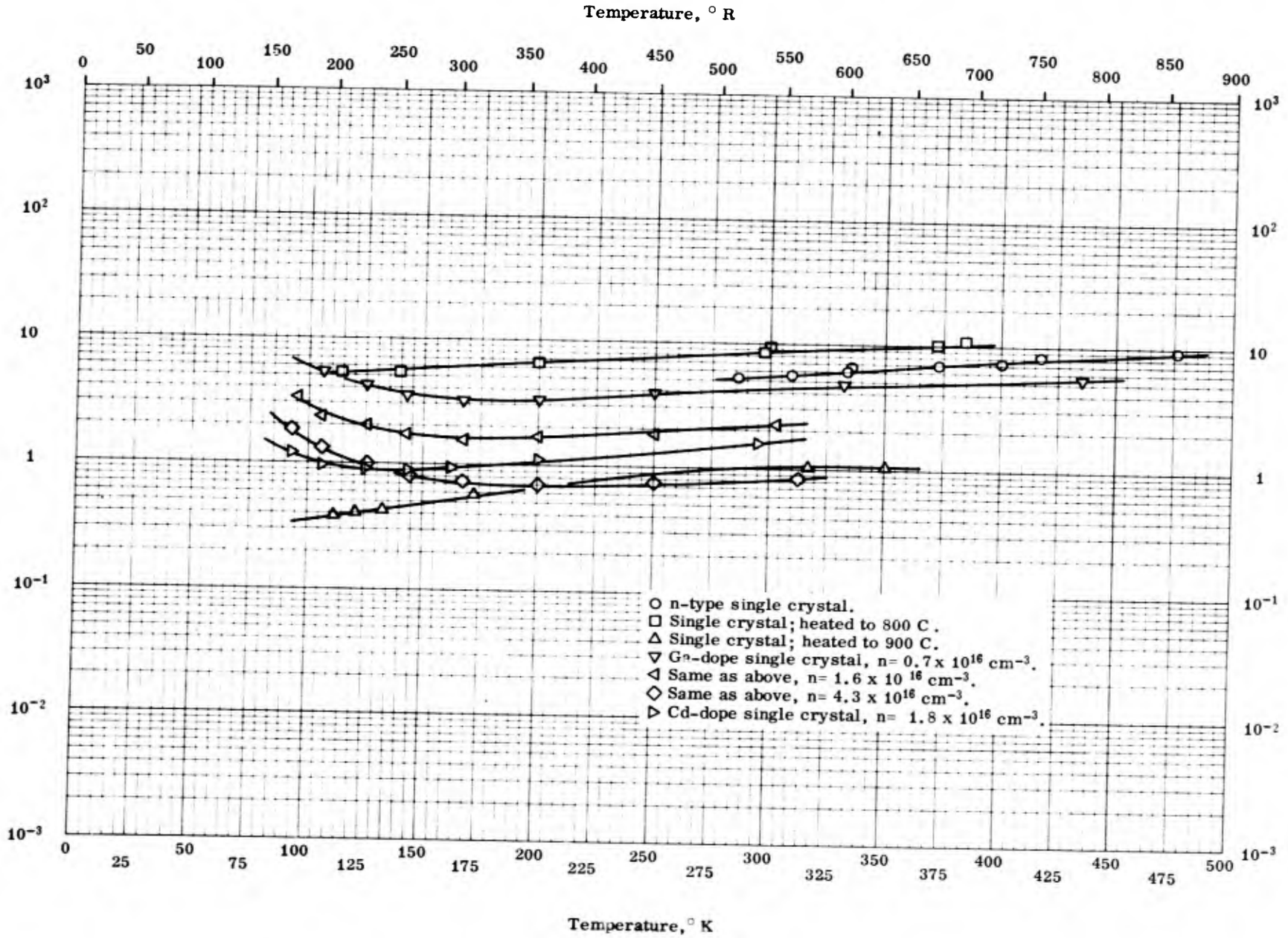


THERMAL CONDUCTIVITY -- BISMUTH TELLURIDE SULFIDE

THERMAL CONDUCTIVITY -- BISMUTH TELLURIDE SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-2	80-300		Bi_2Te_2S.	

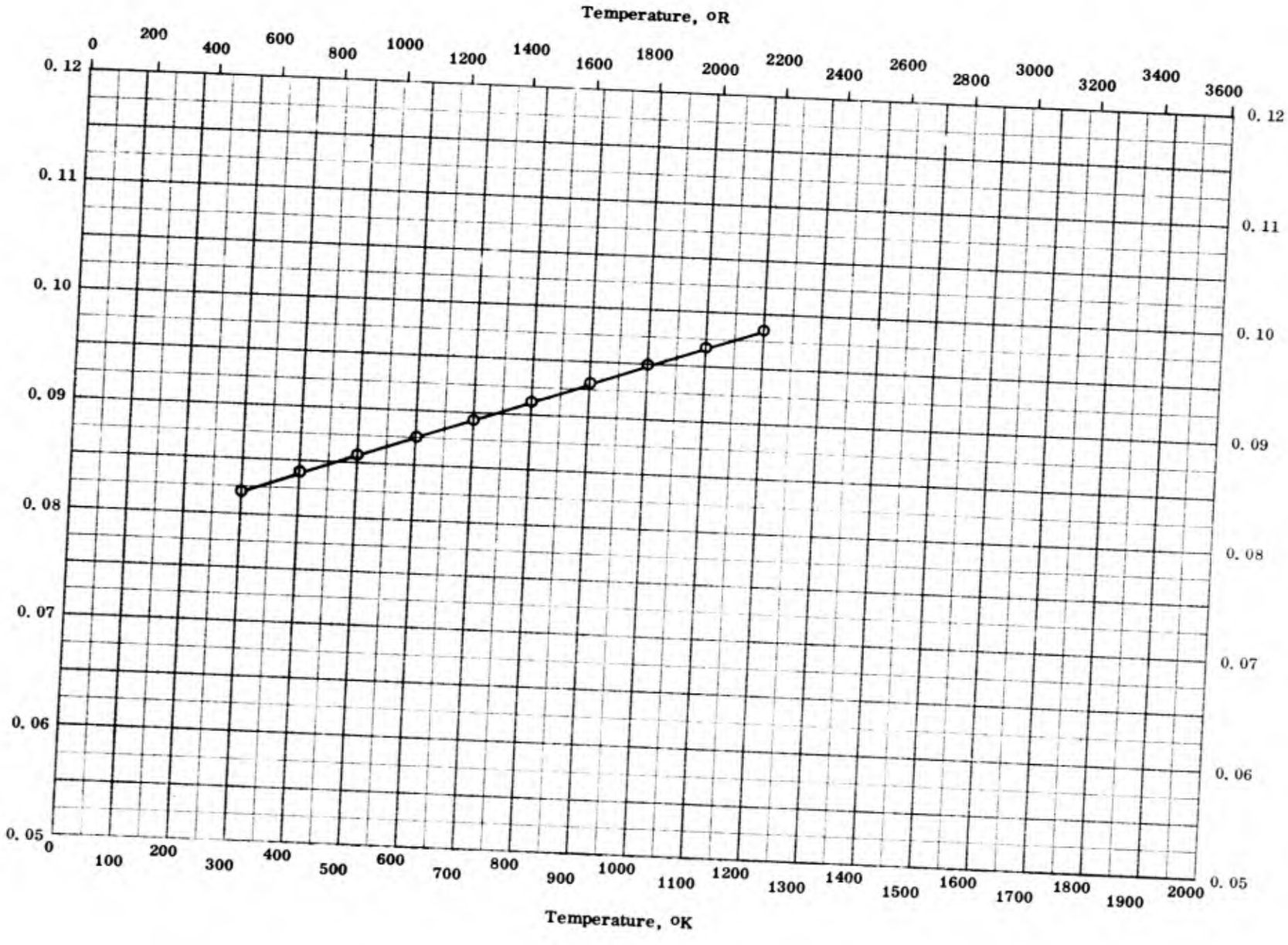


ELECTRICAL RESISTIVITY -- CADMIUM SULFIDE

ELECTRICAL RESISTIVITY -- CADMIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	58-5	286-476		Pure n-type single crystal CdS.	
□	59-5	128-384		Single crystal CdS.	Heated at 800 C and P_{cd} = 0.45 atm.
△	59-5	112-350		Same as above.	Heated at 900 C and P_{cd} = 3.7 atm.
▽	59-6	106-435		Single crystal CdS and Ga doped; CdS/Ga, n= 0.7 x 10^{16} cm^{-3} at 300 K.	
◁	59-6	95-303		Same as above except n=1.6 x 10^{16} cm^{-3} at 300 K.	
▷	59-6	93-294		Single crystal CdS with Cd doped; CdS/Cd, n= 1.8 x 10^{16} cm^{-3} at 300 K.	
◇	59-6	2-313		Single crystal CdS with Ga doped; CdS/Ga, n= 4.3 x 10^{16} cm^{-3} at 300 K.	

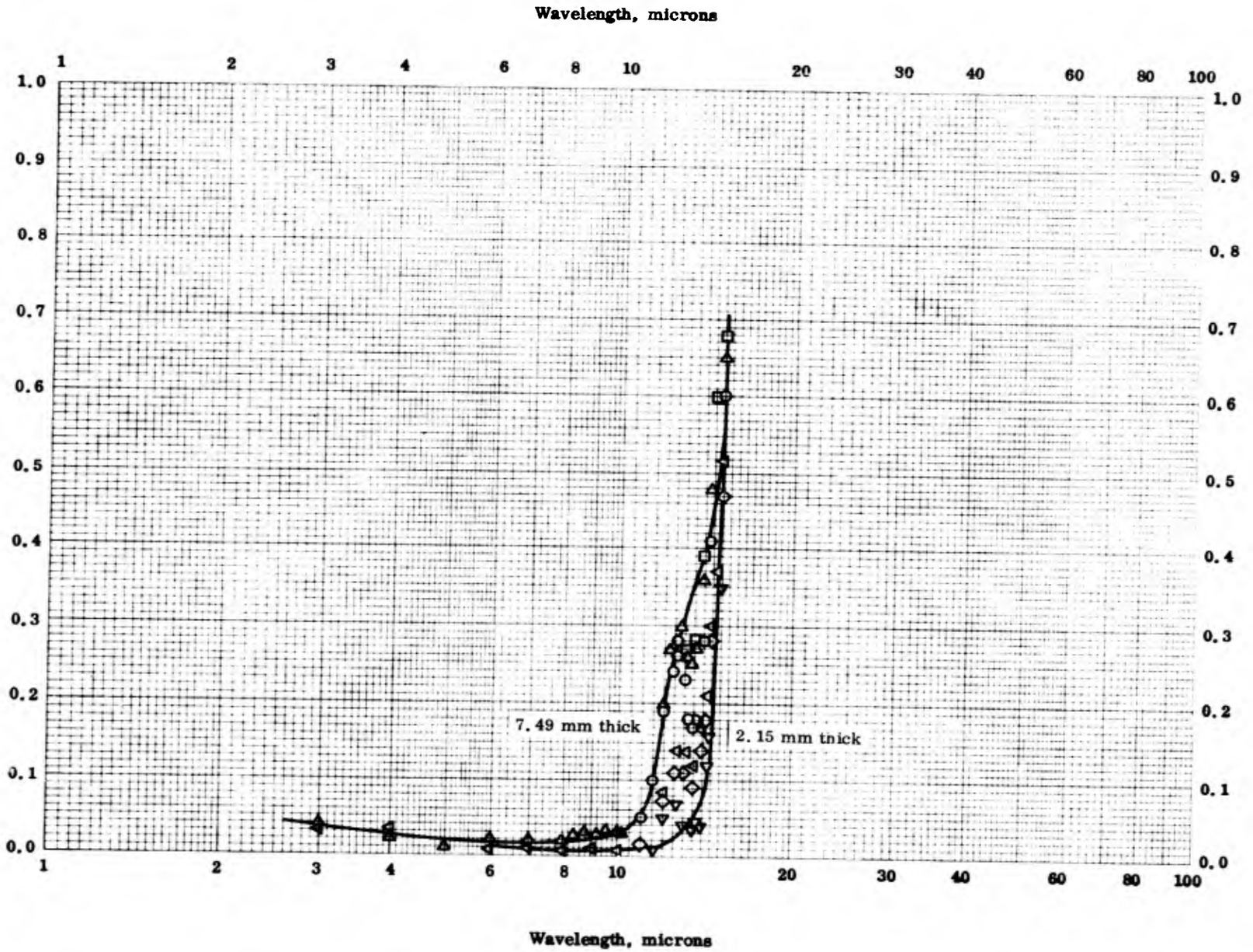


SPECIFIC HEAT -- CADMIUM SULFIDE

SPECIFIC HEAT -- CADMIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	65-1	300-1200	1.5	CdS; 0.0005 - 0.0010 Si and 0.00005 Mg; sample from Eagle-Picher Company.	



NORMAL SPECTRAL EMITTANCE -- CADMIUM SULFIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- CADMIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	61-6	333	11-15		CdS; 7.49 mm thickness.	Ground and polished.
△	61-6	393	3-15		Same as above.	Same as above.
□	61-6	453	12-15		Same as above.	Same as above.
▽	61-6	333	11-15		CdS; 2.15 mm thickness.	Same as above.
◇	61-6	393	3-15		Same as above.	Same as above.
◁	61-6	453	3-15		Same as above.	Same as above.

PROPERTIES OF CERIUM SULFIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	CeS	5.93	370
△	Ce_3S_4	5.3	331
◇	Ce_2S_3	5.2	325
●	CeS	5.98*	373.2*
■	Ce_3S_4	5.675*	354.1*
▼	α-Ce_2S_3	5.25*	327.6*
◀	CeS_2	5.07	316.4

Melting Point		K	R
▽	CeS	2723 ± 100	4902 ± 180
□	$CeS_{1.15}$	2273 ± 75	4091 ± 135
▲	Ce_3S_4	2323 ± 75	4182 ± 135
◆	Ce_2S_3	2163 ± 50	3894 ± 90
◈	CeS_2	1973	3551

*Most probable value for this compounds.

PROPERTIES OF CERIUM SULFIDES

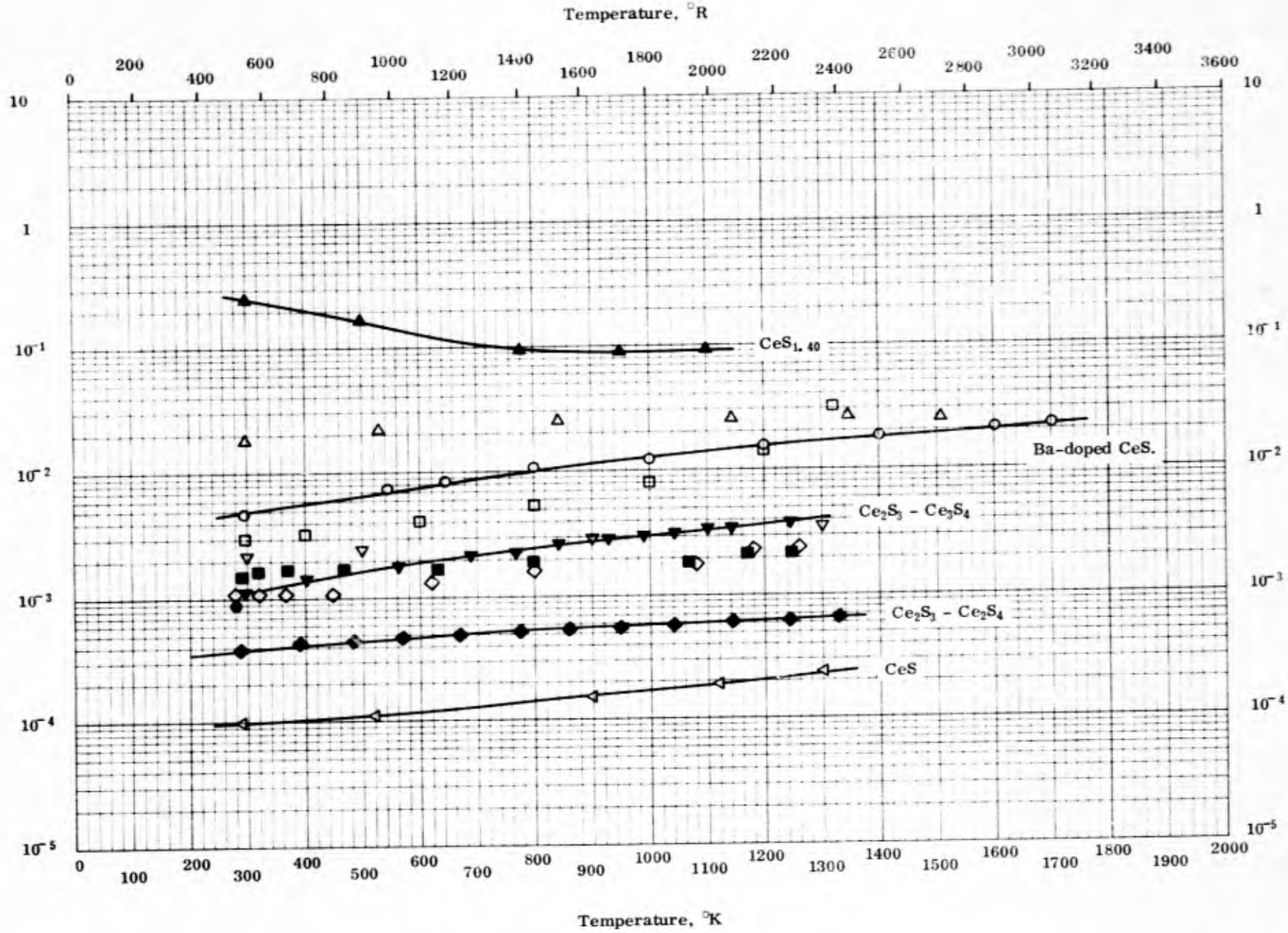
REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	48-1 also 50-1	298		CeS.	
▽	48-1 also 50-1	2623-2823		CeS.	M. P. by visual observation.
□	48-1 also 50-1	2198-2348		$CeS_{1.15}$; eutectic.	Same as above.
△	48-1 also 50-1	298		Ce_3S_4.	
▲	48-1 also 50-1	2248-2398		Ce_3S_4.	M. P. by visual observation.
◇	48-1 also 50-1	298		Ce_2C_3.	
◆	48-1 also 50-1	2113-2213		Ce_2S_3.	M. P. by visual observation.

(Continued onto next page)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
●	62-44	298		CeS.	
■	62-44	298		Ce_3S_4.	
▼	62-44	298		γ-Ce_2S_3.	
◀	62-44	298		CeS_2.	
◆	56-9	1973		CeS_2.	

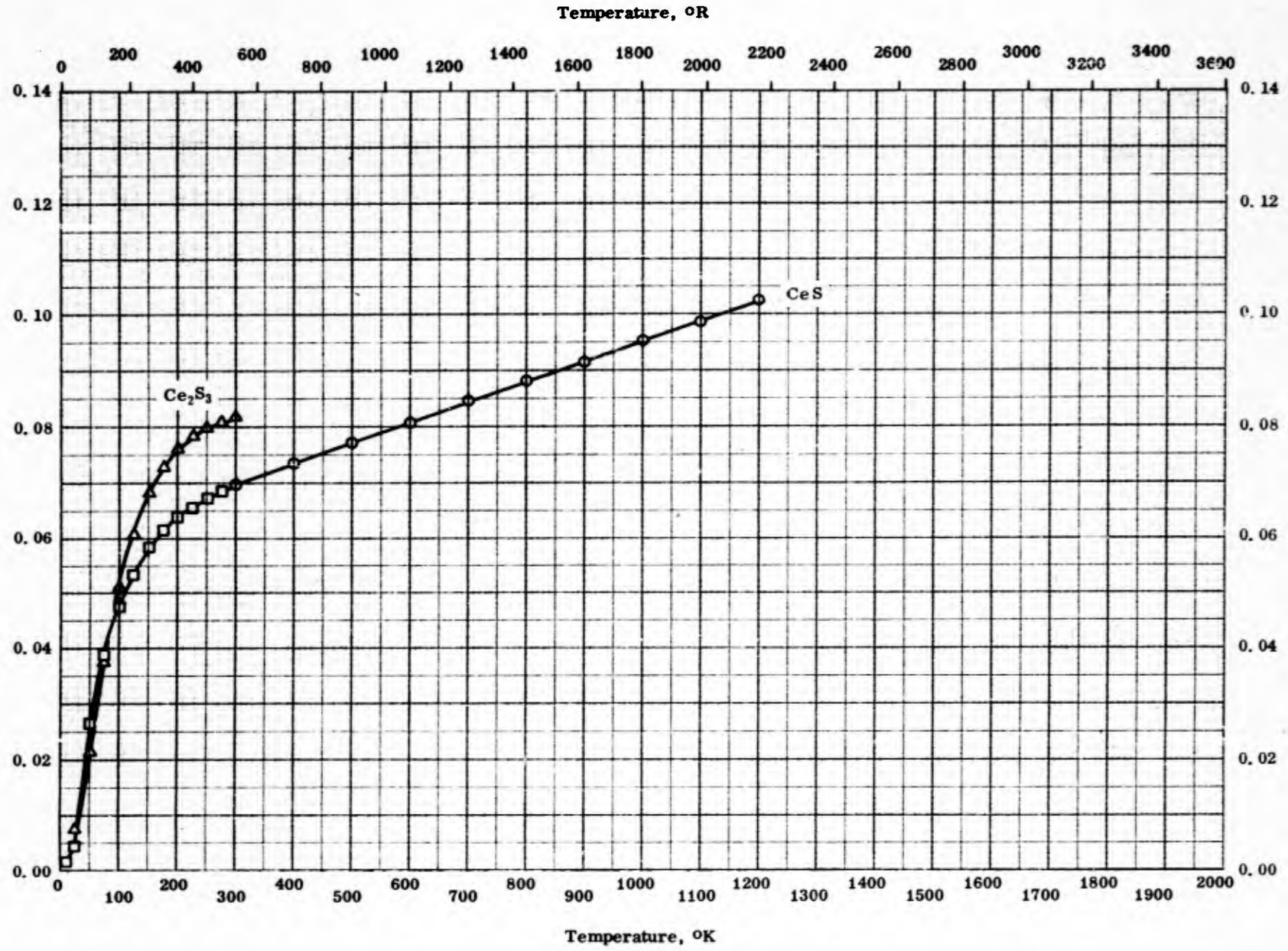


ELECTRICAL RESISTIVITY -- CERIUM SULFIDES

Electrical Resistivity, ohm cm

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	60-7	298-1508		Barium doped CeS.	
○	60-7	298-1700		Barium doped CeS; 63.9 Ce, 23.3 S, and 7.8 Ba.	
□	60-7	298-1300		Barium doped CeS.	
▽	60-2	300-1300		$CeS_{1.37}$ and 1.0 Al.	Sintered in argon.
◁	60-2	290-1300		CeS.	
●	60-2	280		$CeS_{1.37}$.	
◇	60-2	280-1260		$CeS_{1.37}$ $(SnS)_{0.038}$.	
■	60-2	290-1250		$CeS_{1.37}$ $(SnS)_{0.089}$.	
▲	60-2	300-1100		$CeS_{1.40}$.	
▼	62-11	293-1243		Fused Ce_2S_3 - Ce_3S_4; 1.0 C and 0.0410 total metallic impurity; actual ratio, S/Ce = 1.42.	
◆	62-11	293-1333		Fused Ce_2S_3 - Ce_2S_4 with 6.0 CeS, 1.5 C, and 0.0035 total materials; ratio, S/Ce, 1.27.	



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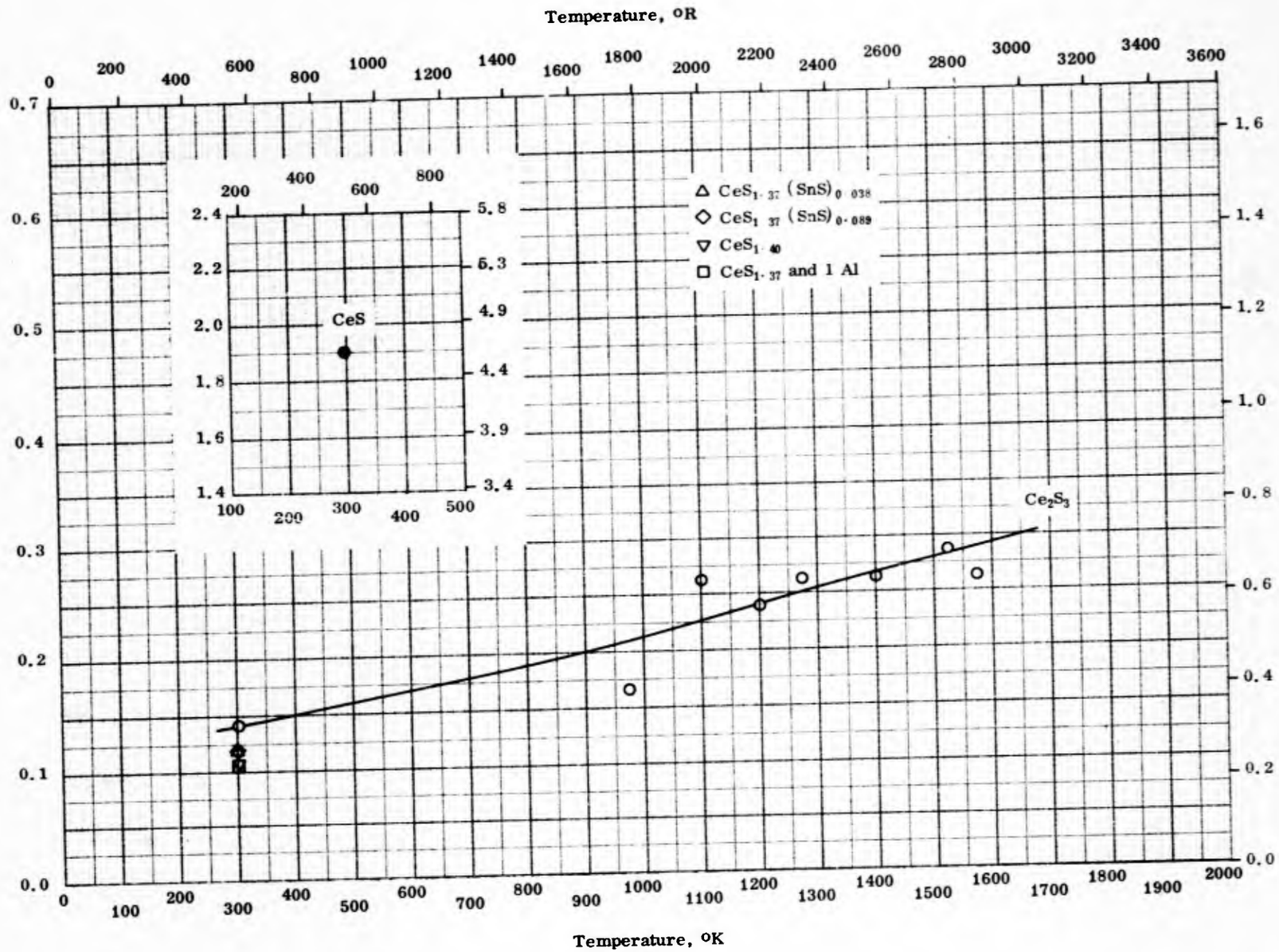
SPECIFIC HEAT -- CERIUM SULFIDES

SPECIFIC HEAT -- CERIUM SULFIDES

REFERENCE INFORMATION

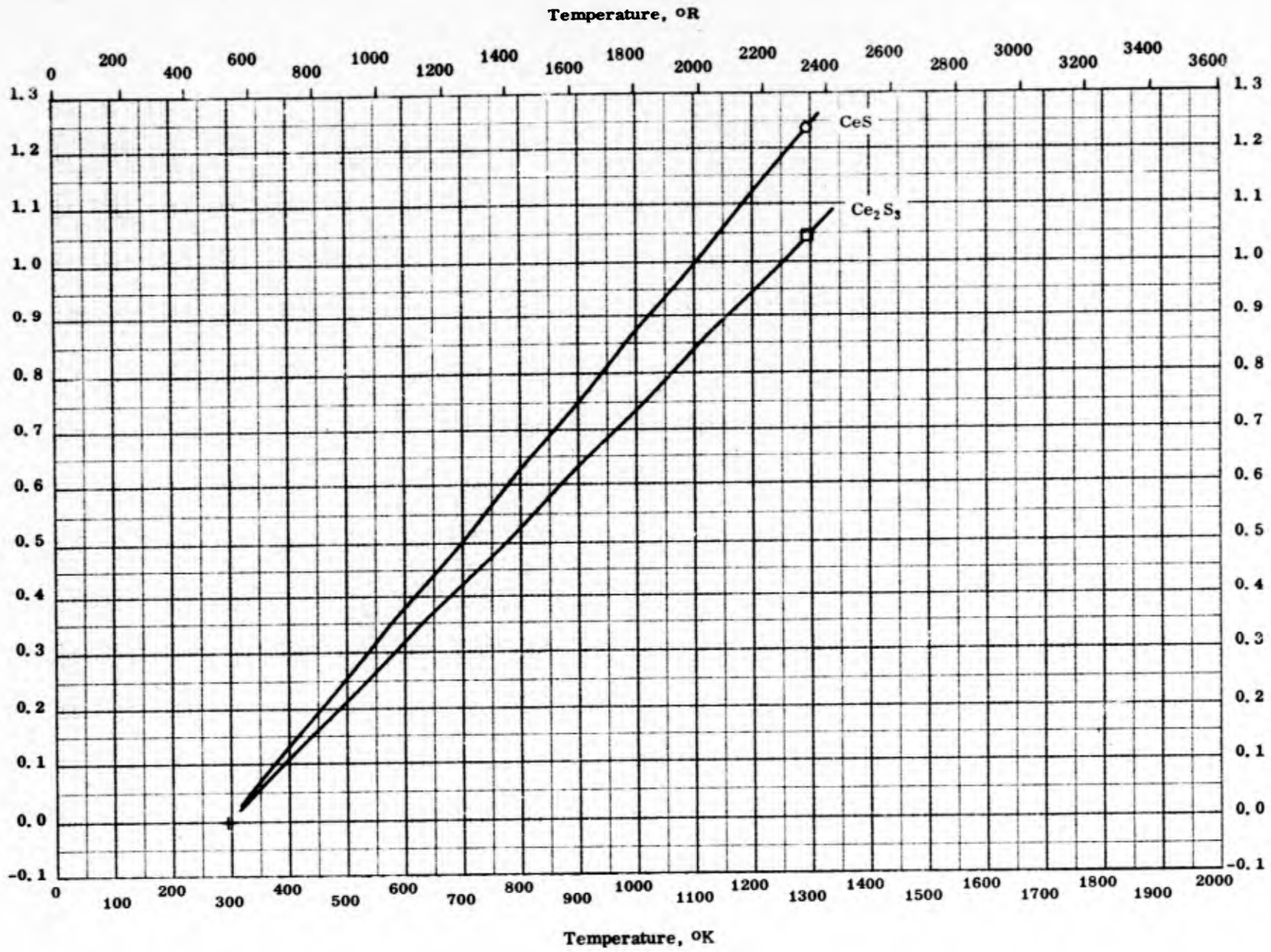
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	65-1	300-1200	3.4	CeS; traces of Cd and Ng.	
□	59-14	50-298	0.3	CeS; 81.40 Ce and 18.56 S.	
△	59-14	50-298	0.3	Cerium sesquisulfide, Ce_2S_3; 74.27 Ce and 25.30 S.	



THERMAL CONDUCTIVITY -- CERIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
●	52-1	298		CeS.	Author assumes uncertainty of factor of 2.
○	60-4	300-1573		Cerium(ous) sulfide, Ce_2S_3.	
△	60-2	300		$CeS_{1.37}(SnS)_{0.038}$	
◇	60-2	300		$CeS_{1.37}(SnS)_{0.089}$	
▽	60-2	300		$CeS_{1.40}$	
□	60-2	300		$CeS_{1.37}$ and 1 Al.	Sintered in argon in a molybdenum bomb.

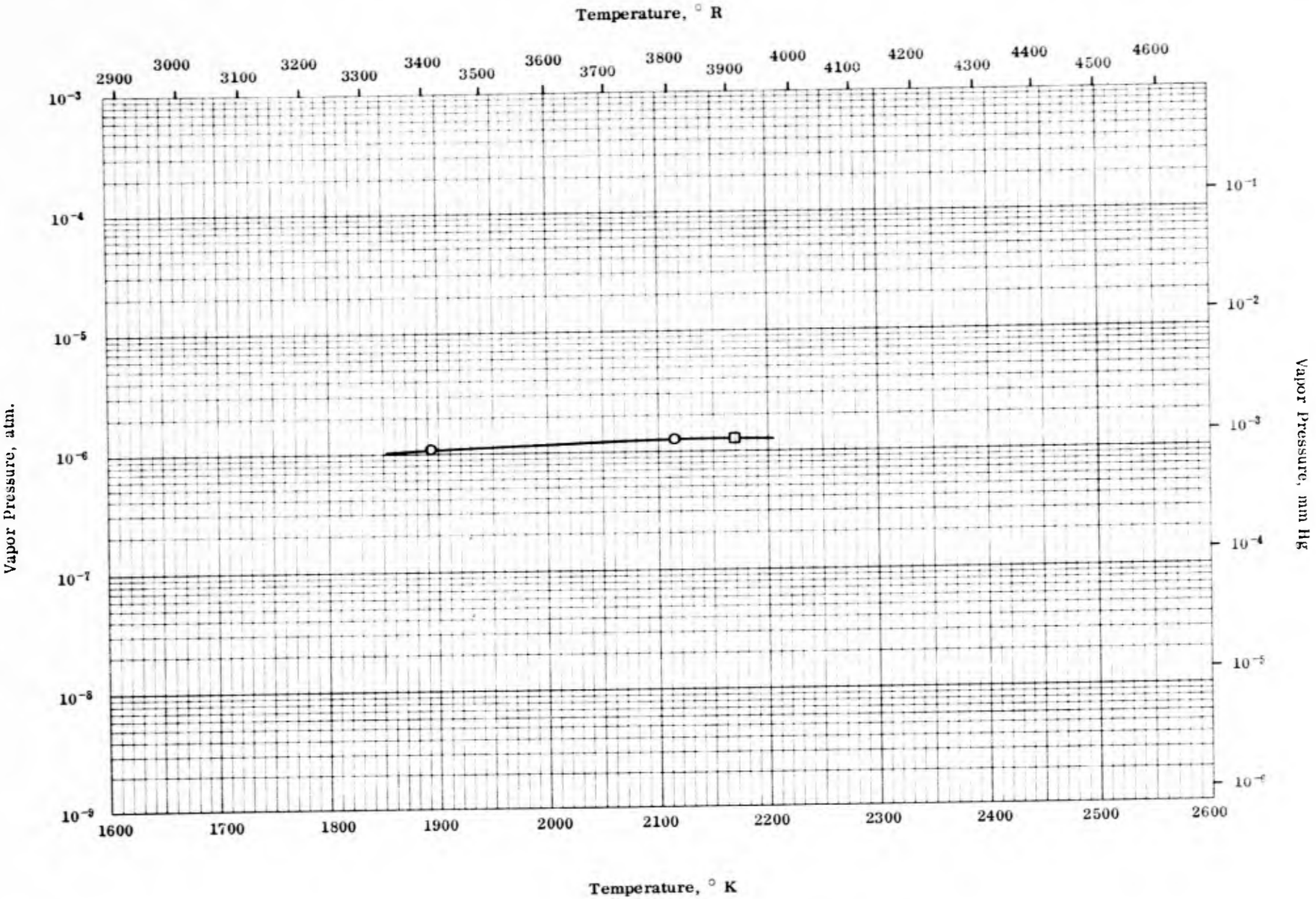


THERMAL LINEAR EXPANSION — CERIUM SULFIDES

THERMAL LINEAR EXPANSION -- CERIUM SULFIDES

REFERENCE INFORMATION

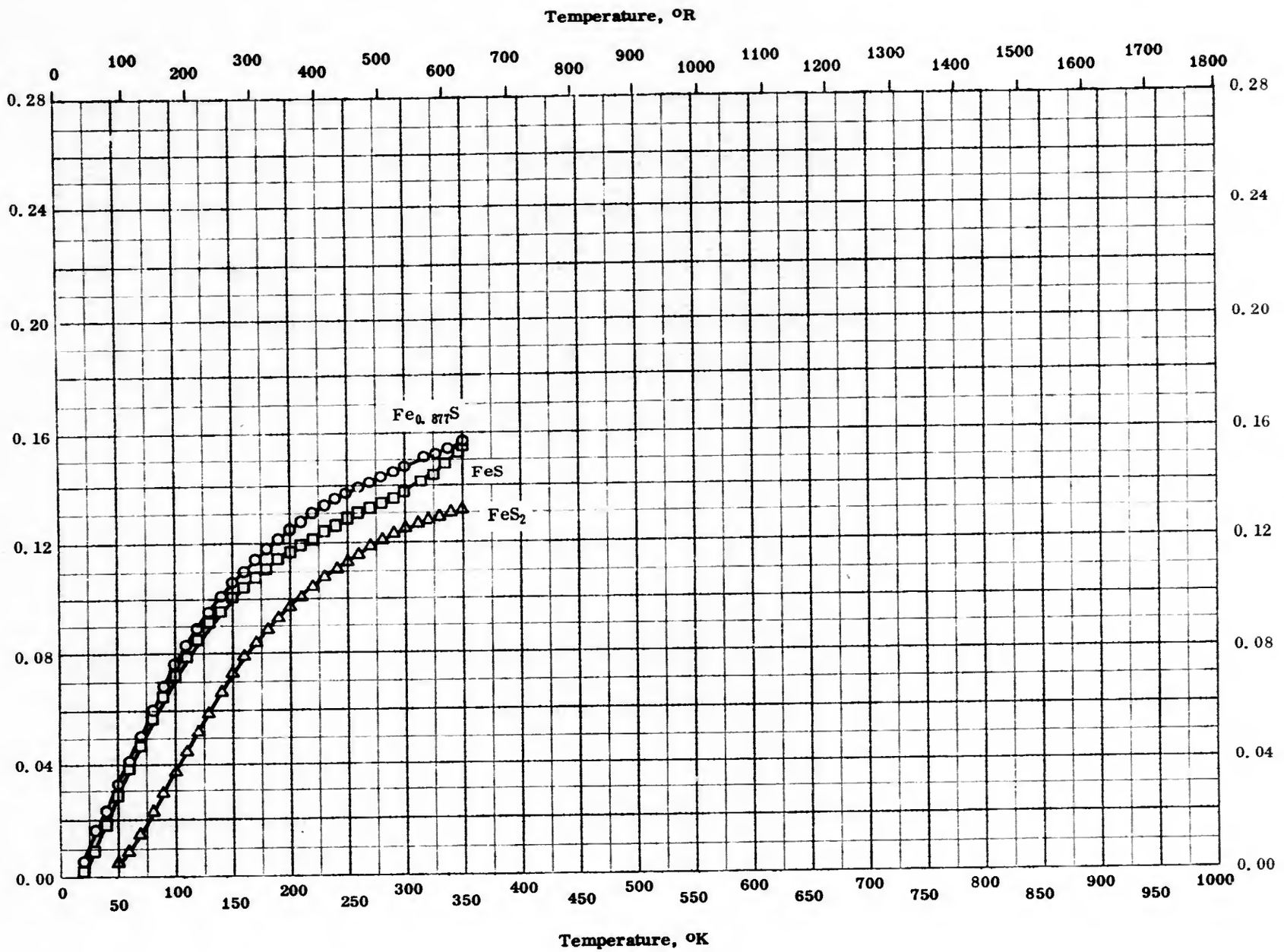
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-26	293-1293		Almost stoichimoetric CeS; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.
□	63-26	293-1293		Almost stoichiometric Ce_2S_3; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.



VAPOR PRESSURE -- CERIUM SULFIDES

REFERENCE INFORMATION

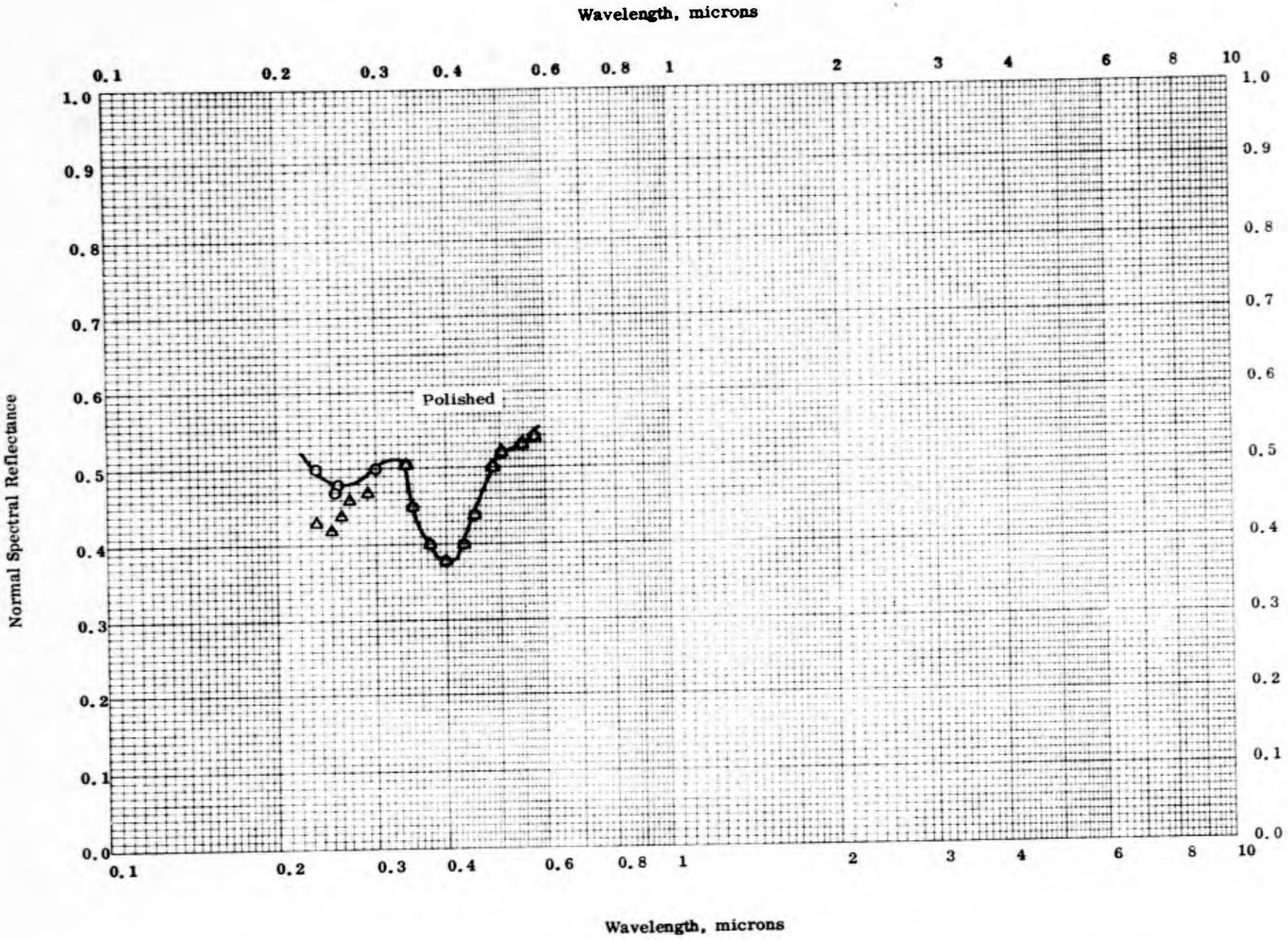
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	50-1	1893-2173		CeS crystal; density 5.93 g cm^{-3}.	
○	50-1	1893-2173		Ce_3S_4; density 5.3 g cm^{-3}.	



SPECIFIC HEAT -- IRON SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	59-13	5-350		$Fe_{0.877}S$; 0.01 Ni, 0.01 S, and 0.001 Mn.	Sulfur purified by double distillation; prepared by reacting stoichiometric amounts of Fe and S in an electric furnace at 800 C and cooled after completion of reaction; heated 7 days at 800 C; cooled to room temperature at 100 C per day; fragmented; homogenized at 290 C and after 30 days cooled to room temperature over a period of 6 days.
□	59-13	5-350	0.1	FeS; same impurities as above.	Same as above.
△	62-31	5-350	< 5	FeS_2; 46.52 Fe, 53.45 S, 0.0080 Mn, 0.0080 Si, and 0.0075 Ni; sample from Bosmogrube, Nordland, Norway.	Crushed to 30 - 80 mesh powder.



NORMAL SPECTRAL REFLECTANCE -- IRON DISULFIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- IRON DISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	24-1	298	0.235-0.575		FeS_2, pyrites.	Perfectly flat and highly polished surface with some stries extending lengthwise across the surface; new surface.
Δ	24-1	298	0.235-0.575		Same as above.	Same as above; old surface.

PROPERTIES OF LANTHANUM SULFIDES

REPORTED VALUES

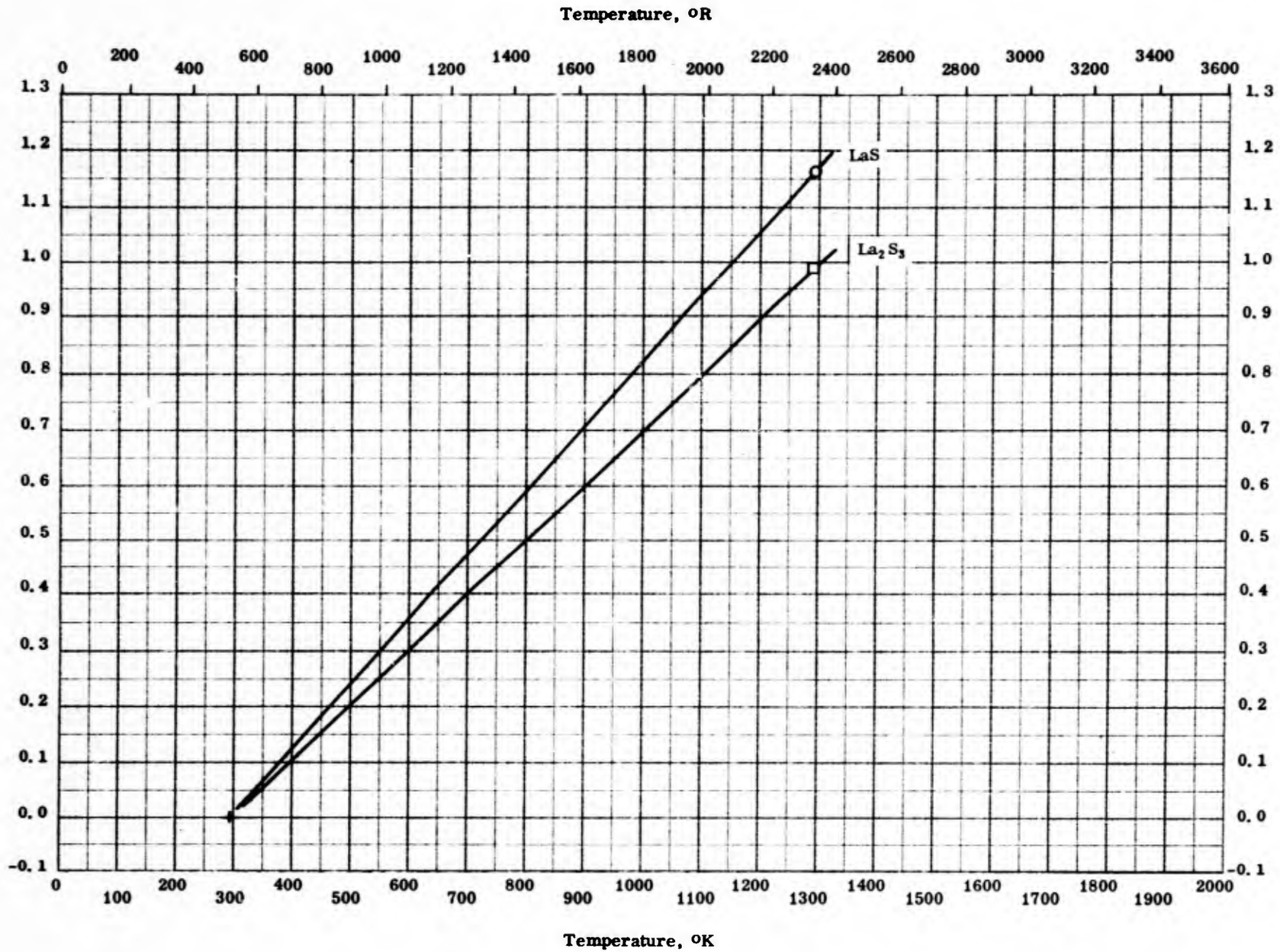
Density		g cm^{-3}	lb ft^{-3}
○	LaS	5.86	365.7
□	La_3S_4	5.44	339.5
△	$\gamma - La_2S_3$	4.98	310.8
▽	LaS_2	4.77	297.6
Melting Point		**K**	**K**
●	La_2S_3	2398 ± 25	4316 ± 45
■	La_3S_4	2373	4271
▲	LaS	2573*	4631*
▼	LaS	2243	4037

*Most probable value for this compound.

PROPERTIES OF LANTHANUM SULFIDES

REFERENCE INFORMATION

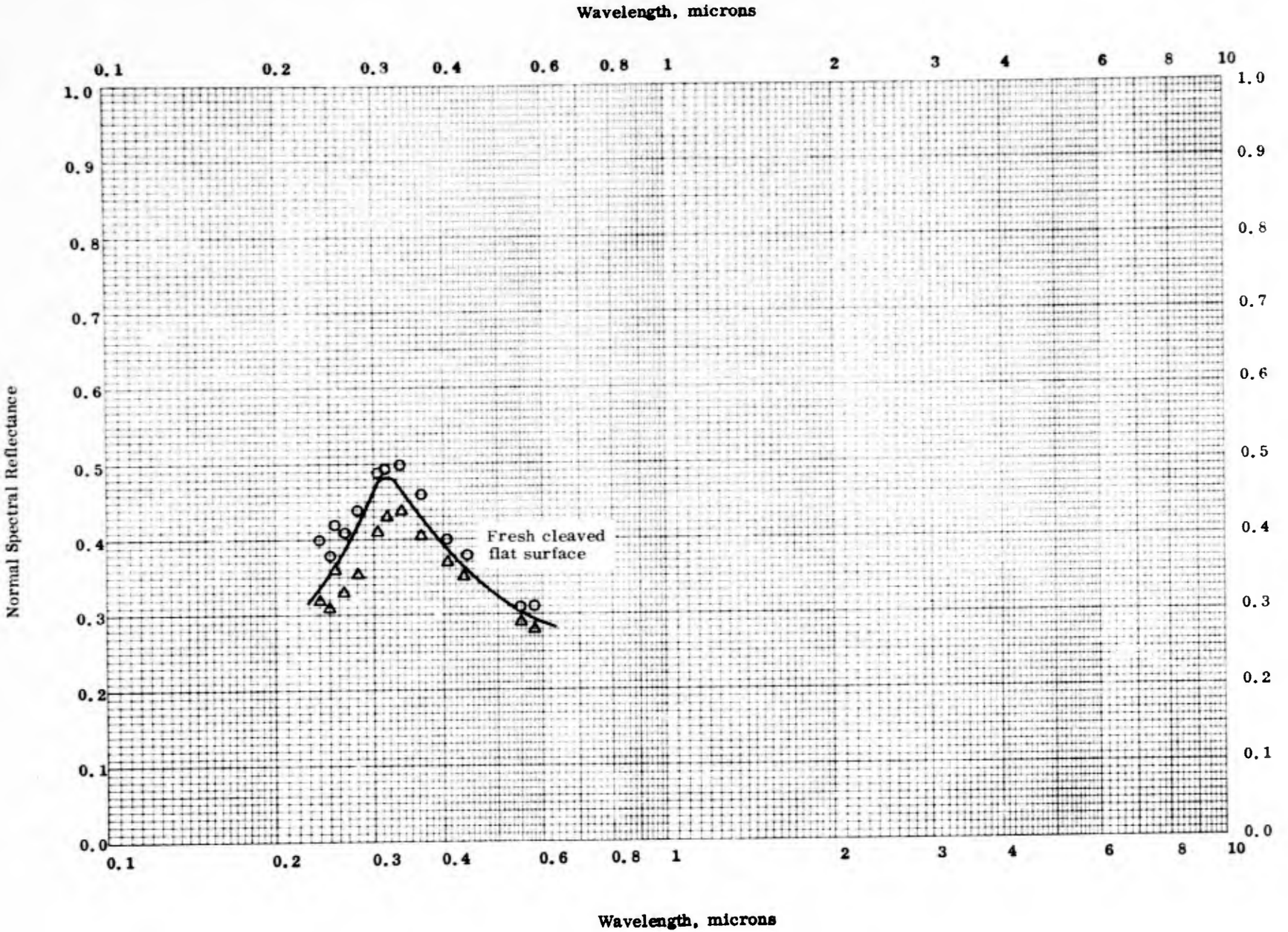
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		LaS.	
□	62-44	298		La_3S_4.	
△	62-44	298		γ - La_2S_3.	
▽	62-44	298		LaS_2.	
■	60-25	2373		La_3S_4.	
▲	60-25	2573		LaS.	
▼	56-10	2243		LaS.	
●	31-1	2373-2423		La_2S_3.	Measured in vacuum.



THERMAL LINEAR EXPANSION -- LANTHANUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-26	293-1273		Almost stoichiometric LaS; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.
□	63-26	293-1293		Almost stoichiometric La_2S_3; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.



NORMAL SPECTRAL REFLECTANCE -- LEAD SULFIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- LEAD SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	24-1	298	0.24-0.58		Pbs, galena.	Fresh cleaved flat surface.
△	24-1	298	0.24-0.58		Same as above.	Same as above; another sample.

PROPERTIES OF MOLYBDENUM DISULFIDE

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	4.80*	300*
Melting Point	1923 ± 25	3507

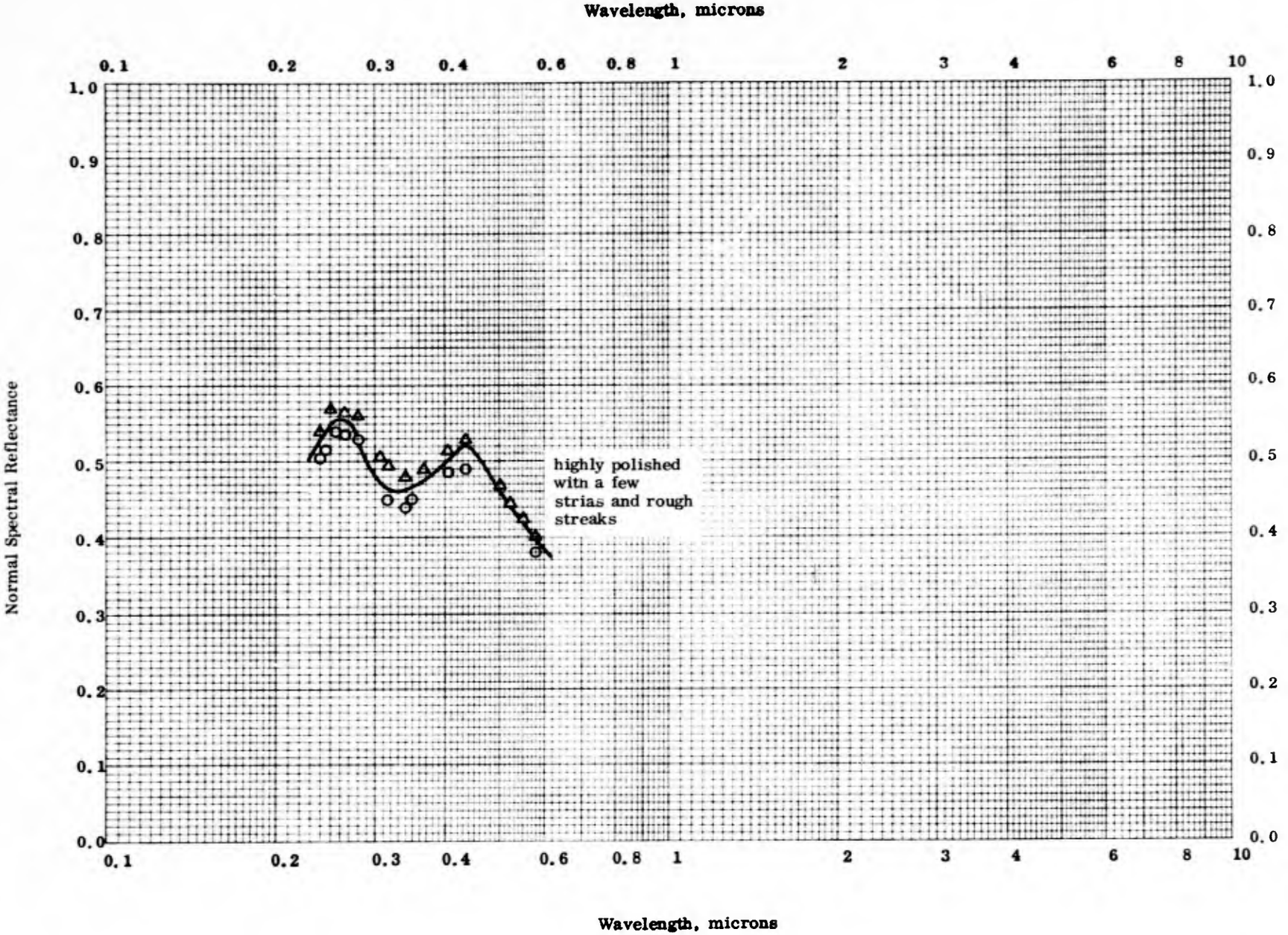
*Handbook of Chemistry and Physics (Ref. 64-18)

REPORTED VALUES

Melting Point	K	R
O	1923 ± 25	3507 ± 45

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	56-13	1923-1973		MoS_2; initial composition: 58.45 Mo and 39.02 S; at 1650 C, 60.48 Mo and 37.7 S; and at 1700 C, 70.24 Mo and 31.8 S.	Heated in press to 1600 - 1900 C; melts with decomposition at 1650 - 1700 C.



NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISULFIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	24-1	298	0.24-0.58		MoS_2, molybdenite from Renfrew Co., Canada.	Thin cleaved lemina; pressed out smooth upon flat plates of glass, highly polished but contained a few strias and rough streaks.
△	24-1	298	0.24-0.58		Same as above.	Same as above; another sample.

PROPERTIES OF NEODYMIUM SULFIDES

REPORTED VALUES

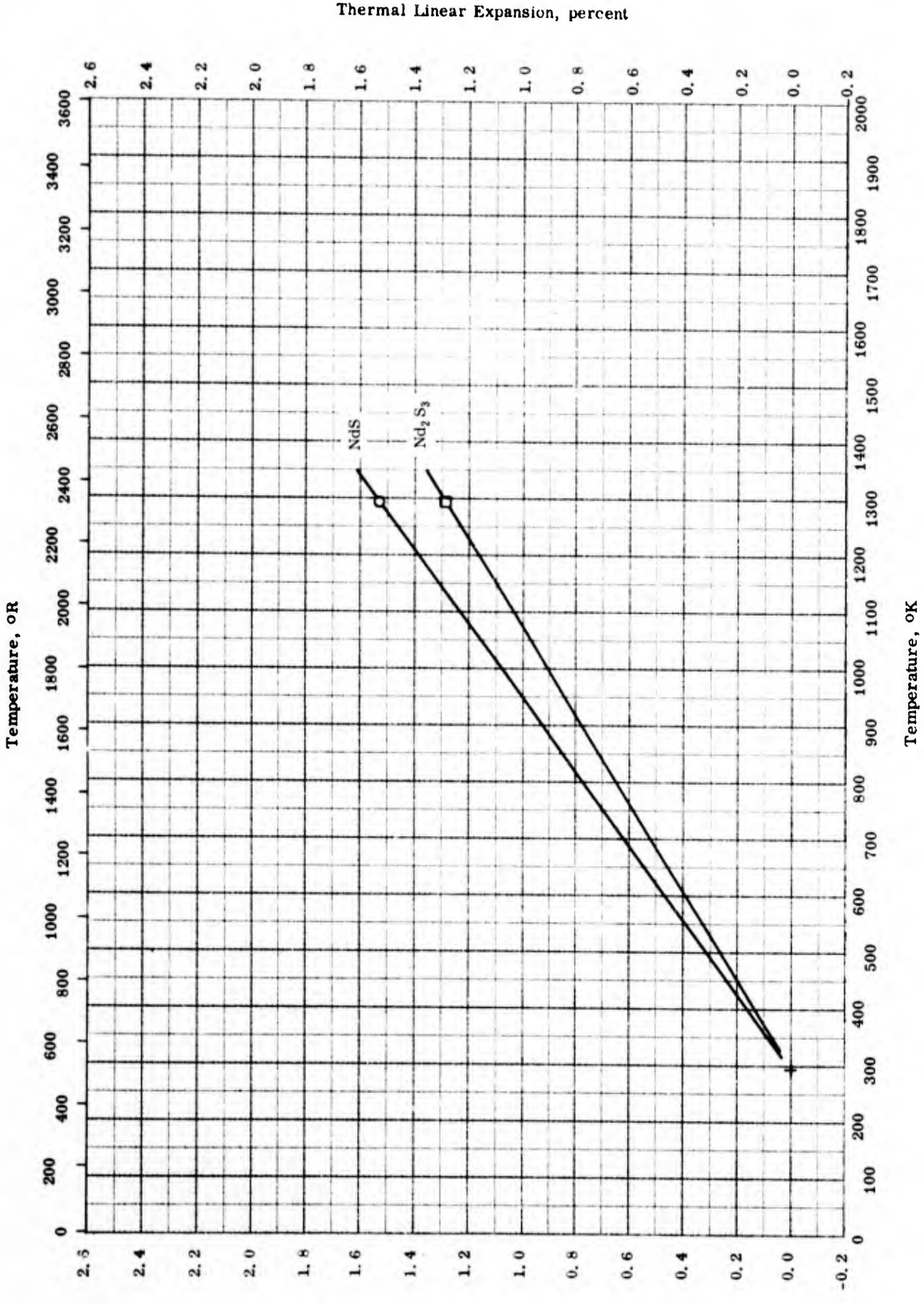
Density		g cm^{-3}	lb ft^{-3}
○	NdS	6.36	396.9
	Nd_3S_4	6.02	375.6
	γ - Nd_2S_3	5.50	343.2

Melting Point		K	R
□	NdS_2	2033	3660
△	Nd_2S_3	2473	4452
▽	Nd_3S_4	2313	4164
◇	NdS	2413	4344

PROPERTIES OF NEODYMIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Neodymium sulfides.	
□	56-9	2033		NdS_2.	
△	31-1	2473		Nd_2S_3.	
▽	60-25	2313		Nd_3S_4.	
◇	56-10	2413		NdS.	

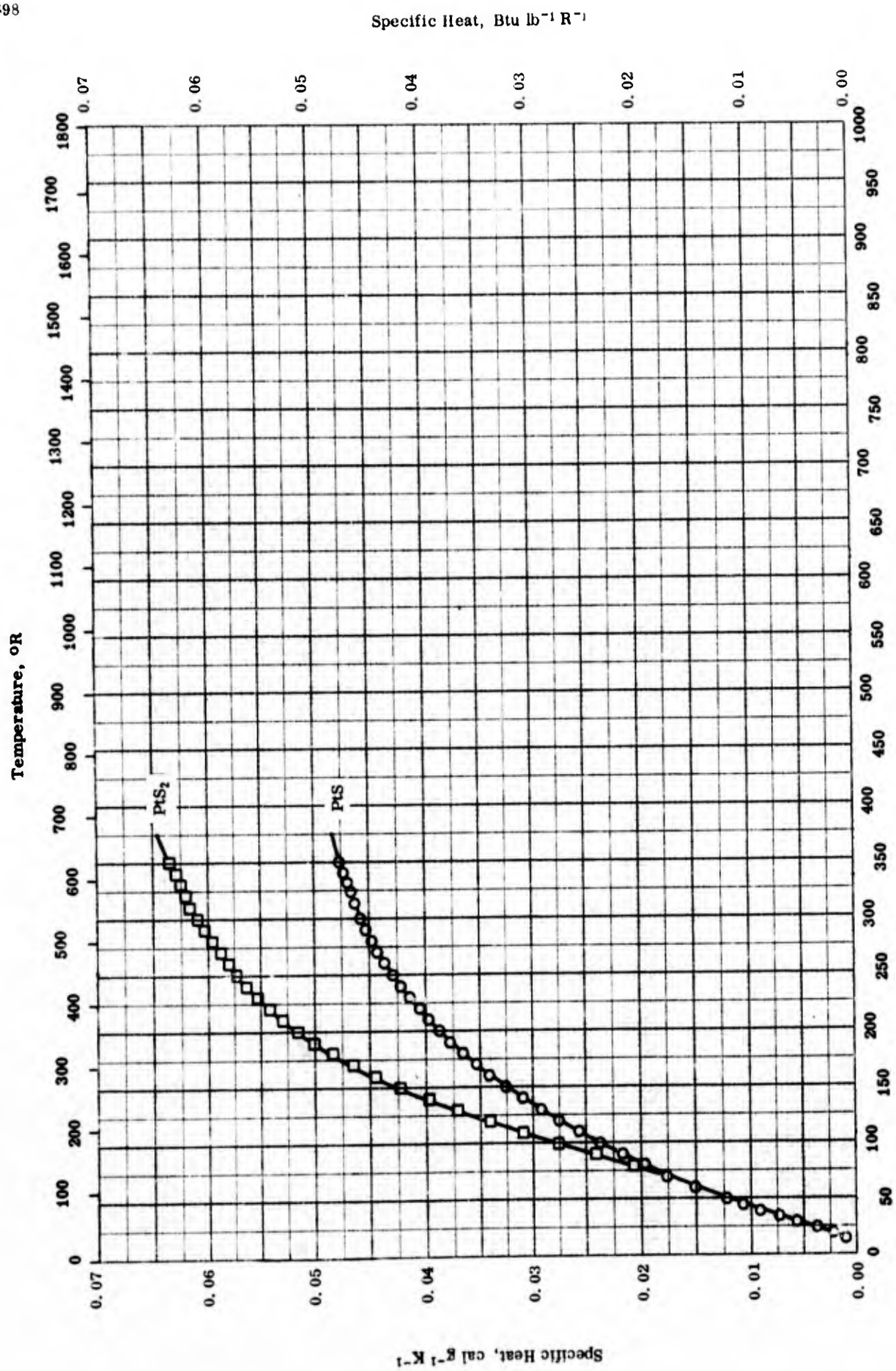


THERMAL LINEAR EXPANSION — NEODYMIUM SULFIDES

THERMAL LINEAR EXPANSION — NEODYMIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-26	293-1293		NdS; sulfur content < 1 below stoichiometric; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.
□	63-26	293-1293		Nd_2S_3; sulfur content < 1 below stoichiometric; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.



SPECIFIC HEAT -- PLATINUM SULFIDES

SPECIFIC HEAT -- PLATINUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	61-21	5-350	0.1	PtS; 0.0090 volatile matter, 0.0010> Fe, 0.0010> Pb, 0.0007 Pb and 0.0001 Au; density 624 lb ft^{-3}.	Synthesized in 2 steps: PtS_2 prepared by heating appropriate amounts of elements in evacuated and sealed silica tube at 750 C for 1 day; sintered product crushed and heated with stoichiometric finely divided platinum 2 days at 900 C; resulting dark grey powder annealed 2 days at 500 C and cooled to room temperature over a period of 7 days.
□	61-18	5-350	0.1	PtS_2; <0.000 Fe, <0.0010 Pd, 0.0007 Pd, 0.0001 Au and 0.0090 volatile material.	Synthesized from stoichiometric amounts of the elements by heating 1 day at 750 C; annealed 7 days at 500 C; cooled slowly to room temperature over 7 days.

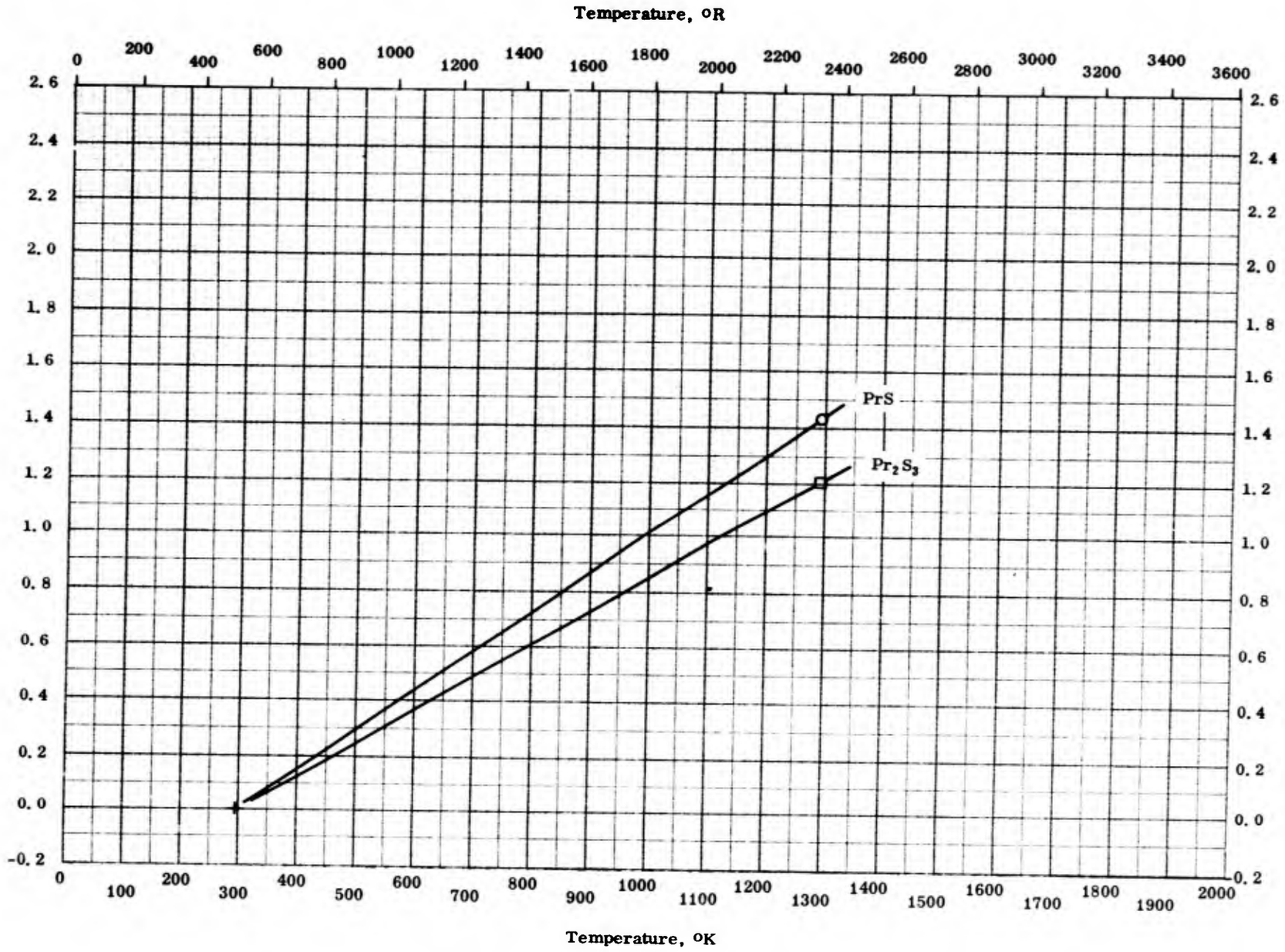
PROPERTIES OF PRASEODYMIUM SULFIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	PrS	6.08	379.4
□	Pr_3S_4	5.77	360.0
△	γ - Pr_2S_3	5.27	328.8
▽	PrS_2	5.11	318.9

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		PrS.	
□	62-44	298		Pr_3S_4.	
△	62-44	298		$\gamma - Pr_2S_3$.	
▽	62-44	298		PrS_2.	



THERMAL LINEAR EXPANSION -- PRASEODYMIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-26	293-1293		PrS; sulfur content < 1 below stoichiometric; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.
□	63-26	293-1293		Pr_2S_3; sulfur content < 1 below stoichiometric; polycrystalline.	Sintered; measured in argon atm; mean data of three measurements.

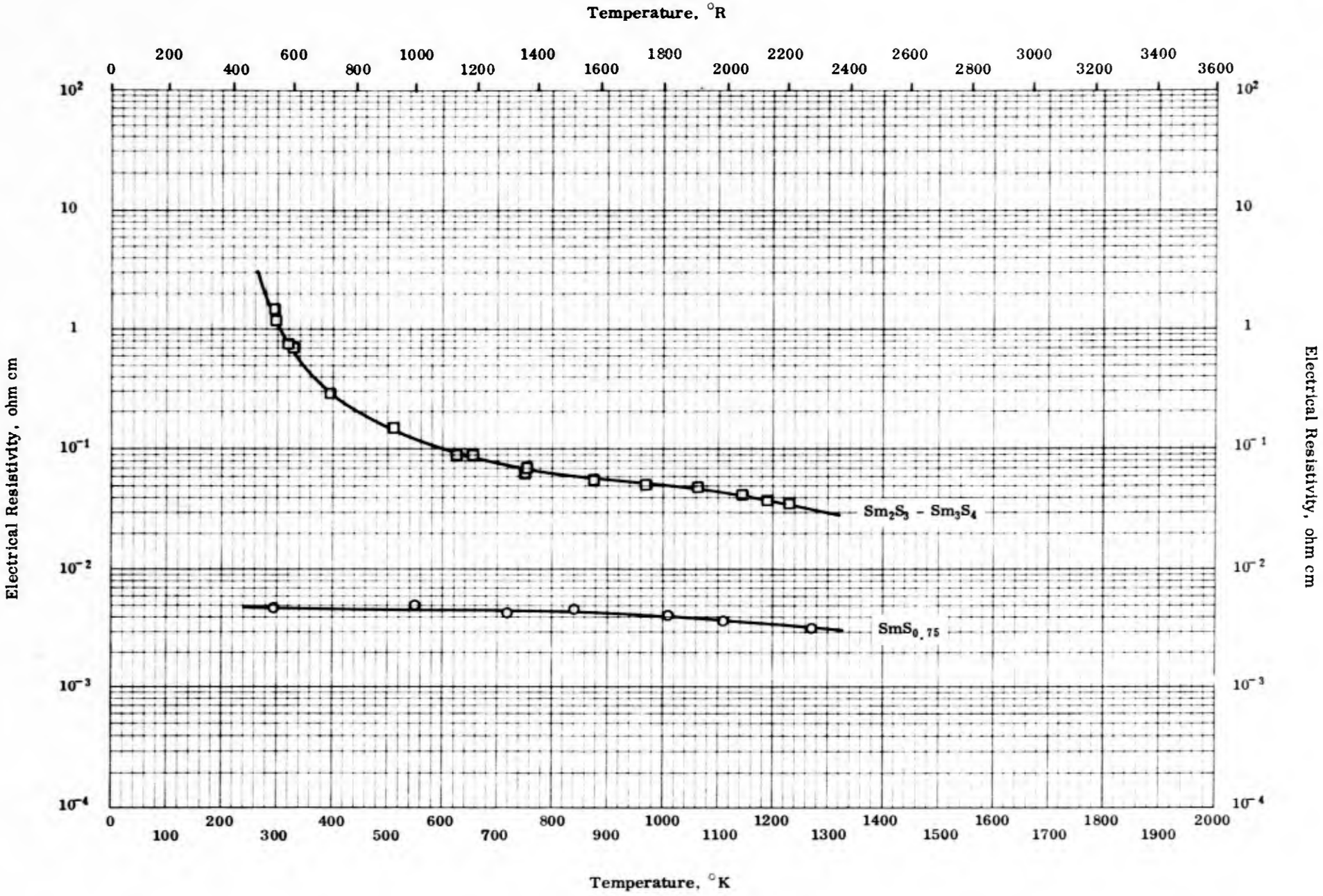
PROPERTIES OF SAMARIUM SULFIDES

REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
○	SmS	6.01	375.0
□	Sm_3S_4	6.14	383.1
△	γ-Sm_2S_3	5.83	363.8
Melting Point		**K**	**R**
▽	SmS_2	2003	3605
▷	Sm_2S_3	2173	3911
◁	Sm_3S_4	2073	3731
◇	SmS	2213	3983

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		SmS.	
□	62-44	298		Sm_3S_4.	
△	62-44	298		$\gamma - Sm_2S_3$.	
▽	56-9	2003		SmS_2.	
▷	31-1	2173		Sm_2S_3.	
◁	60-25	2073		Sm_3S_4.	
◇	56-10	2213		SmS.	

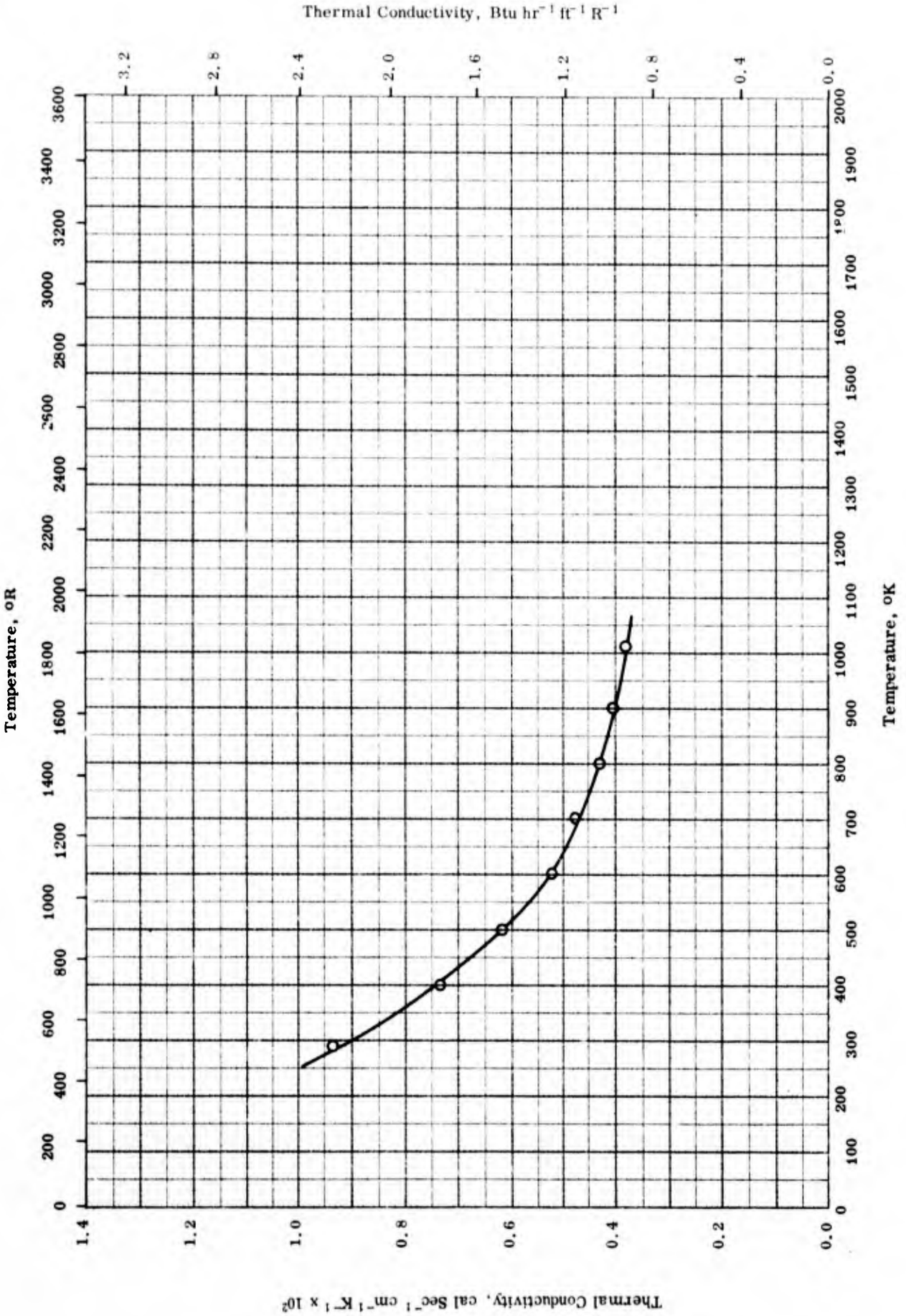


ELECTRICAL RESISTIVITY -- SAMARIUM SULFIDES

ELECTRICAL RESISTIVITY -- SAMARIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-2	295-1270		Sm $S_{0.75}$.	
□	62-11	296-1228		Fused Sm_2S_3 - Sm_3S_4 with 1.0 SmS, 1.0 C, and 0.06 metallic impurities; ratio, S/Sm, 1.41.	Fused.

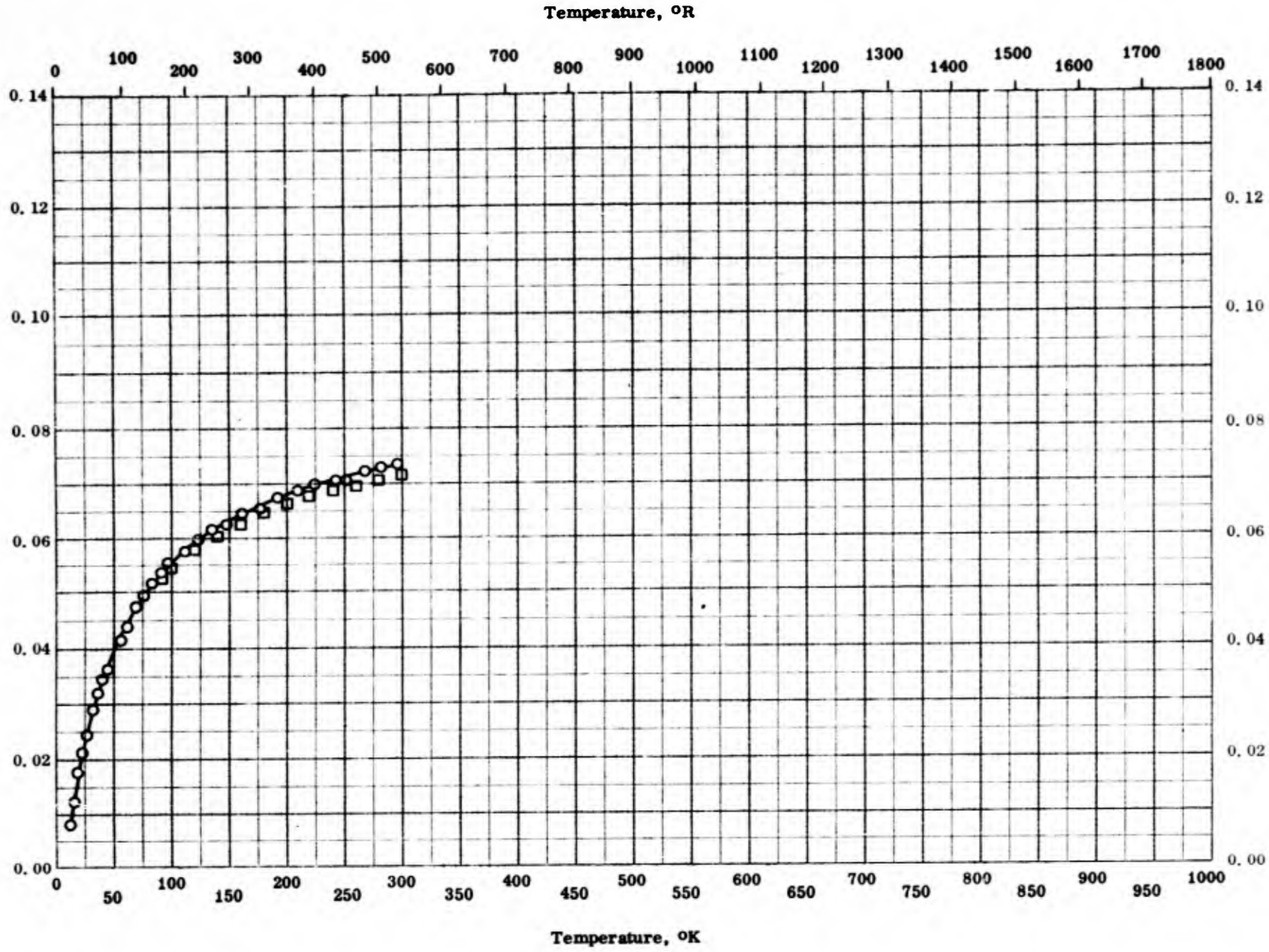


THERMAL CONDUCTIVITY -- SAMARIUM SULFIDE

THERMAL CONDUCTIVITY -- SAMARIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-2	290-1010		SmS.	

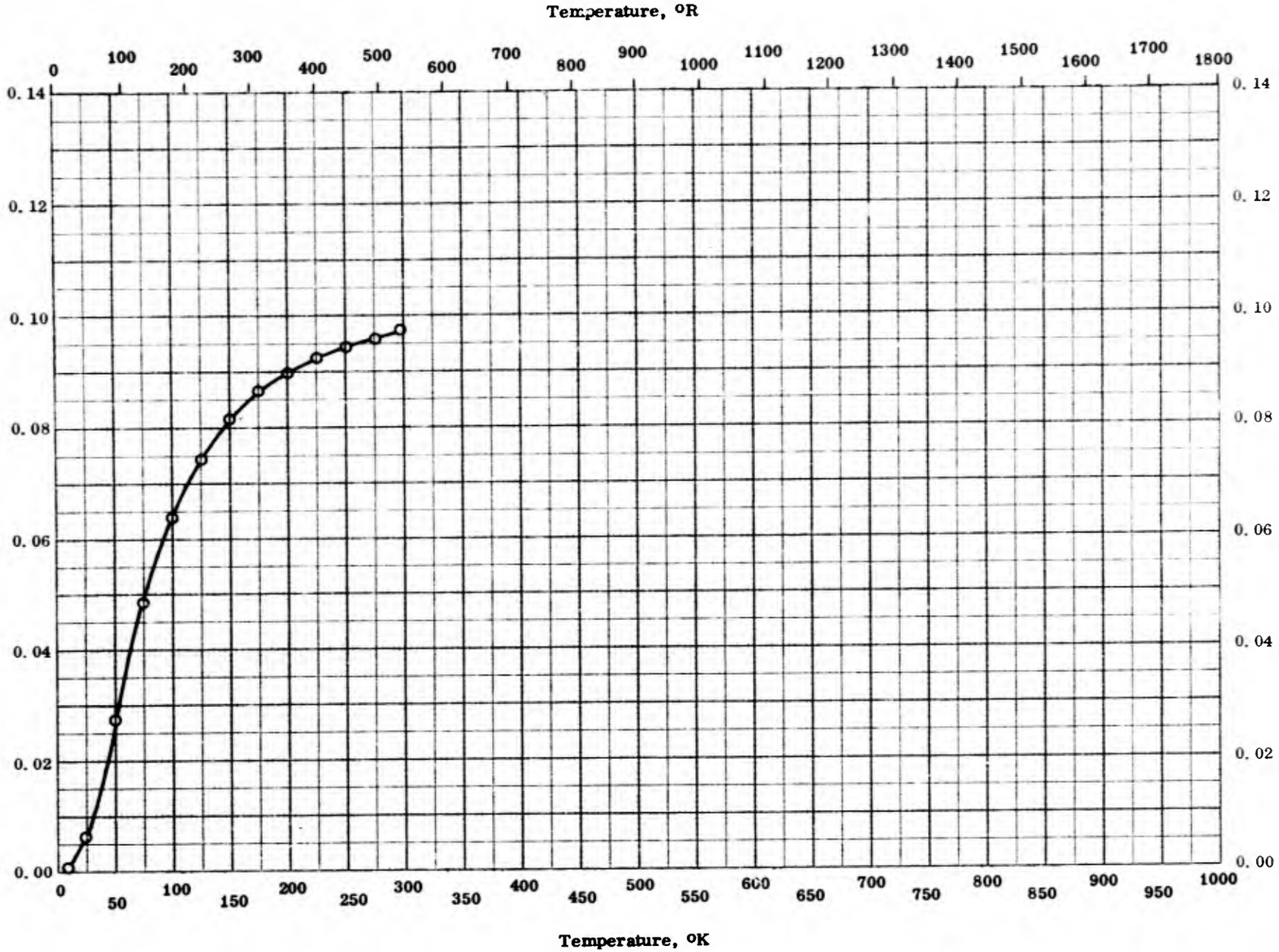


TPRC

SPECIFIC HEAT -- SILVER SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-30 also 62-32	13-296		$Ag_{1.99}S$; 99.99 $Ag_{1.99}S$; n-type semiconductors.	Crushed under argon atm.
□	59-12	80-300		Ag_2S; polycrystalline.	



SPECIFIC HEAT -- STRONTIUM SULFIDE

SPECIFIC HEAT -- STRONTIUM SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-20	50-298		99.16 SrS, 0.83 $SrSO_4$, and 0.01 SiO_2.	Prepared from reagent grade $SrCO_3$ and hydrochloric acid; heated in stream of pure hydrogen 54 hrs at 1000 C.

PROPERTIES OF THORIUM SULFIDES

REPORTED VALUES

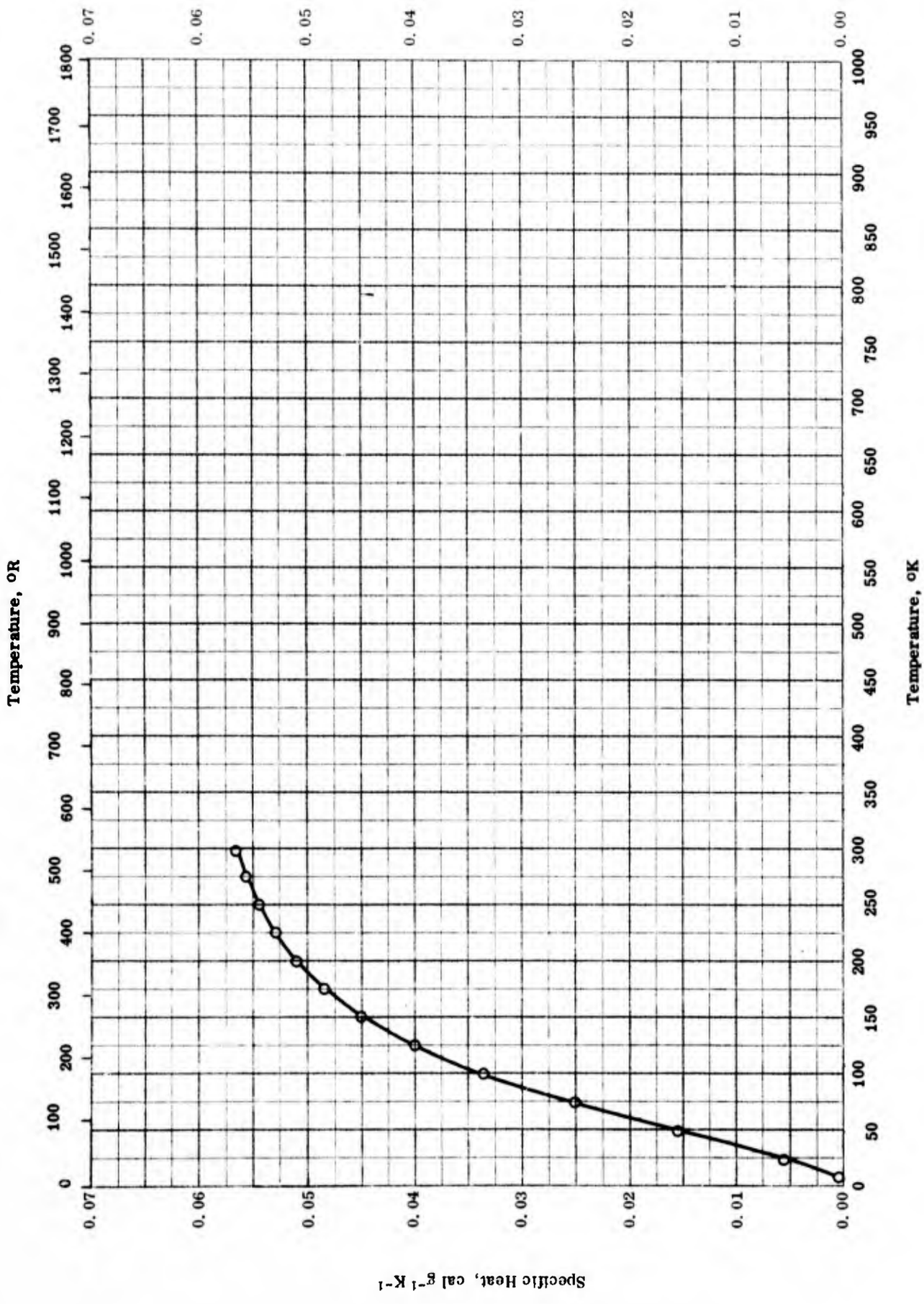
Density		g cm^{-3}	lb ft^{-3}
○	ThS	9.56	597
◇	Th_4S_7 or Th_7S_{12}	7.78	486
●	ThS_2	7.36	460

Melting Point		K	R
■	ThS	2473$^+$	4452$^+$
□	ThS - Th_2S_3	2073$^+$	3732$^+$
△	Th_2S_3	2223± 50	4002± 90
▲	Th_4S_7 or Th_7S_{12}	2043	3678
▽	Th_7S_{12} - ThS_2	2038± 25	3670± 45
▼	ThS_2	2178	3921

PROPERTIES OF THORIUM SULFIDES

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	48-1	298		ThS; silvery metallic lustre.	
■	48-1	2473		Same as above.	
◇	48-1	298		Th_4S_7 or Th_7S_{12}.	
▲	48-1	2073		Same as above.	
●	48-1	298		ThS_2; purple.	
▼	48-1	2178		Same as above.	
□	48-1	2073		Eutectic between ThS and Th_2S_3.	
△	48-1	2173-2273		Th_2S_3; brown.	
▽	48-1	2013-2063		Entectic between Th_4S_7 or Th_7S_{12} and ThS_2.	

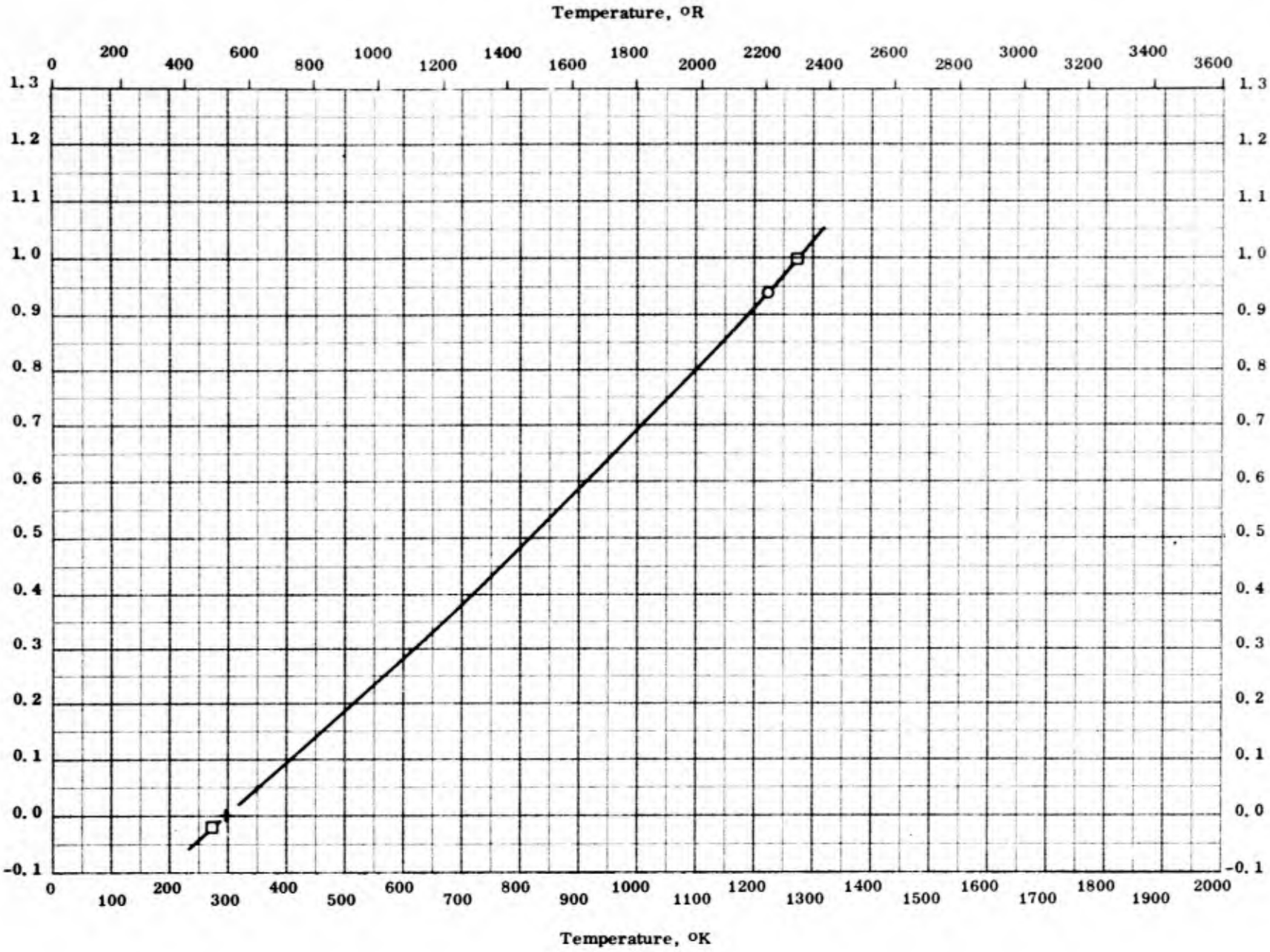


SPECIFIC HEAT -- THORIUM DISULFIDE

SPECIFIC HEAT -- THORIUM DISULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	59-14	50-298	0.3	ThS_2; 78.54 Th and 21.43 S.	

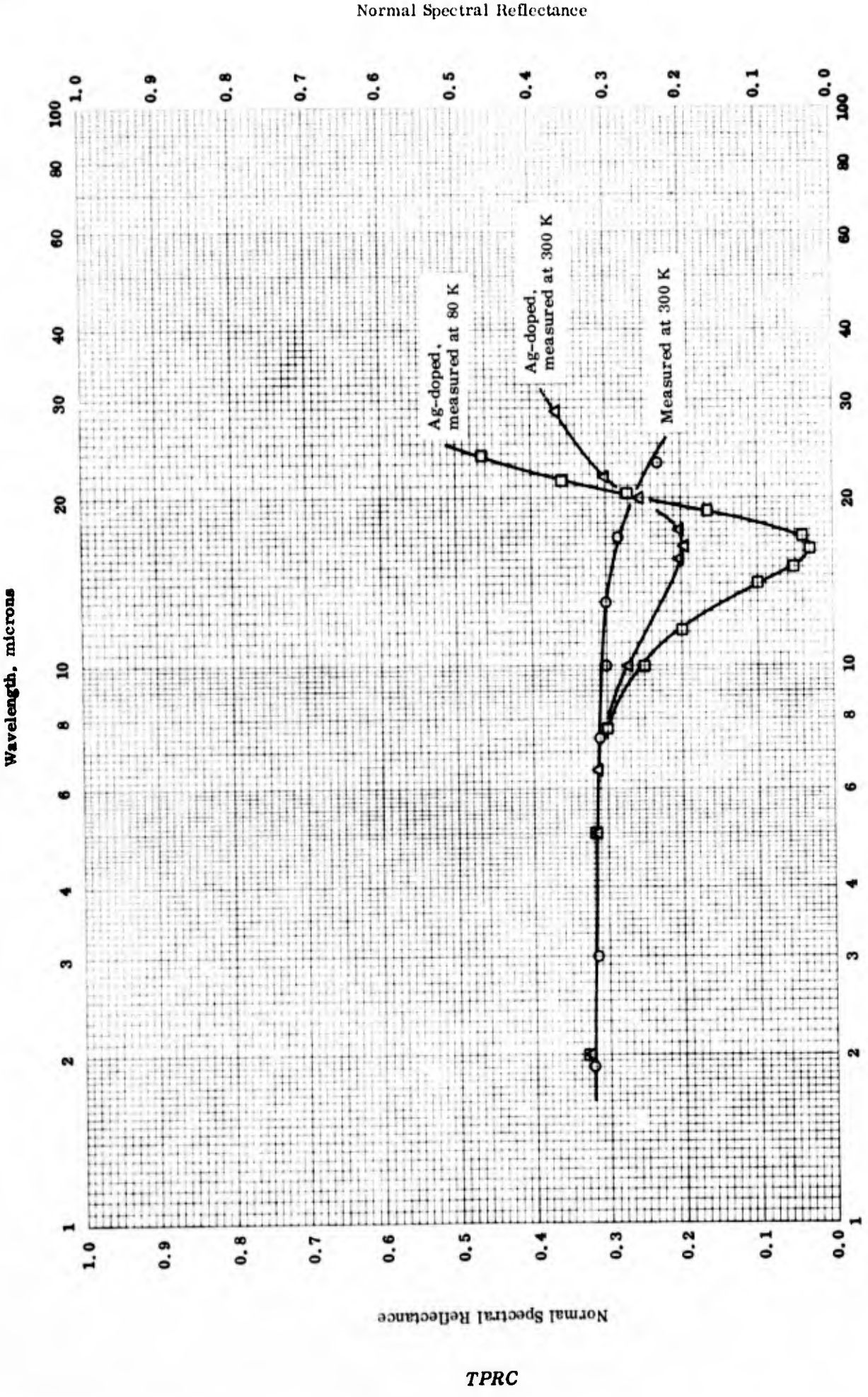


THERMAL LINEAR EXPANSION -- THORIUM MONOSULFIDE

THERMAL LINEAR EXPANSION -- THORIUM MONOSULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-27	293-1223		ThS.	Specimen prepared from highly reactive thorium (0.0900 metallic impurities) produced by hydriding metal turnings at 200 to 500 C, decomposed at 750 C, reacted with stoichiometric amount of H_2S (about 99.5 H_2S) at 700 C, ground to -100 mesh, blended, loosely packed in tungsten crucible in argon atm, homogenized in vacuum (2×10^{-4} to 1×10^{-5} mm Hg) or in inert atm at 1800 to 1900 C, ground to -100 mesh in argon atm, preformed at 15,000 psi in argon atm, isostatically pressed at 55,000 psi with binder of 1 Carbowax and water, and sintered in vacuum or in inert atm at 1900 to 2100 C; measured in vacuum.
□	62-34	273-1273		ThS.	Specimen prepared from thorium powder obtained from the hydride, reacted with stoichiometric H_2S at 500 to 700 C, homogenized to monosulfide phase at approx 1800 C, pressed into pellets at 55,000 psi, and sintered at 1800 to 2100 C.



NORMAL SPECTRAL REFLECTANCE -- TIN MONOSULFIDE

NORMAL SPECTRAL REFLECTANCE -- TIN MONOSULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	61-10	300	1.9-23		Undoped SnS crystal, 4×10^{17} holes cm^{-3}.	Reflecting surface perpendicular to one of the crystallographic axes; surface polished; approximately normal incidence; same data for 80 K.
△	61-10	300	2.0-28.6		Ag-doped SnS crystal, hole concentration 1.06×10^{19} cm^{-3} at 80 K.	Same as above.
□	61-10	80	2.0-23.8		Same as above.	Same as above.

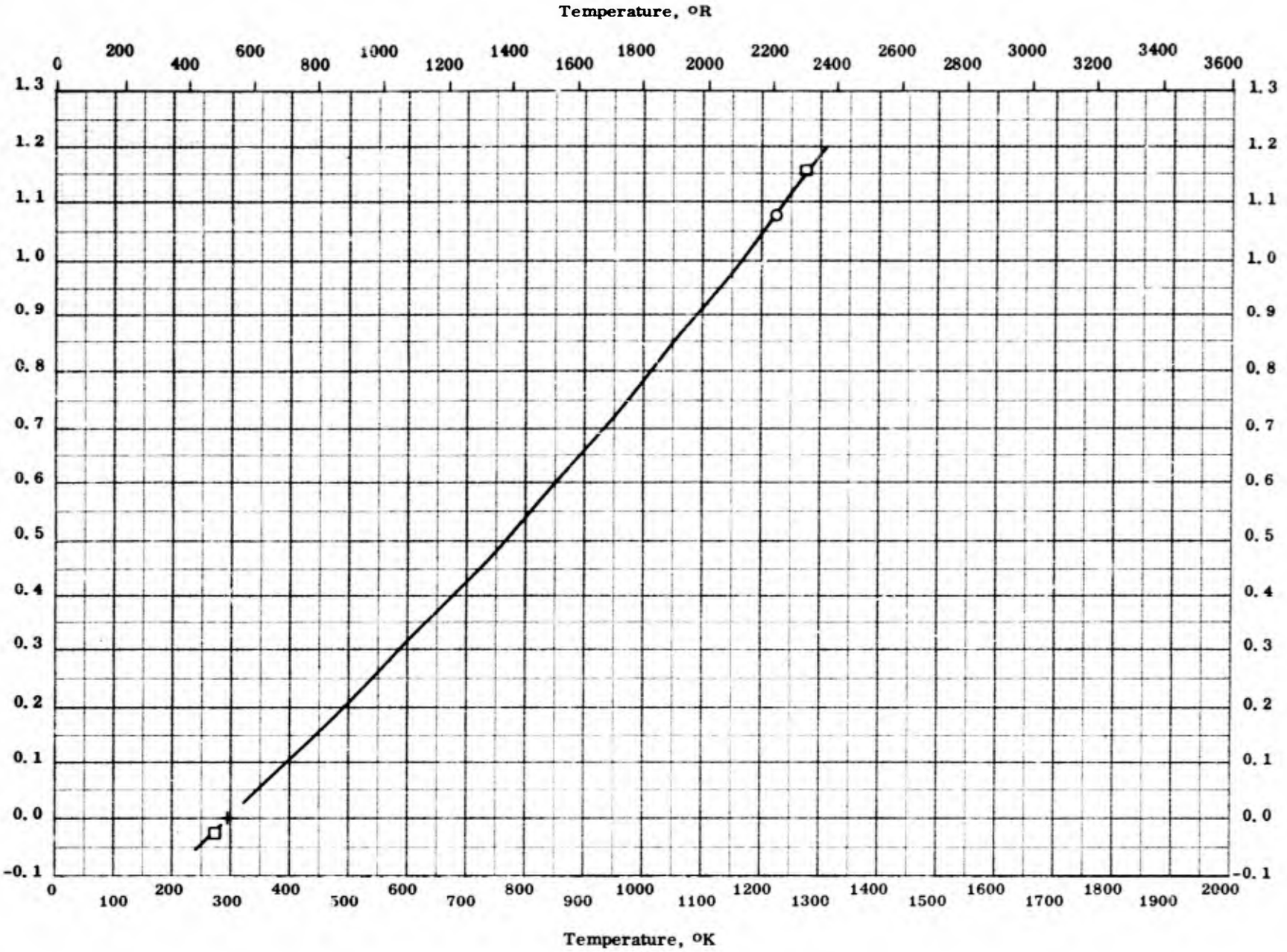
PROPERTIES OF URANIUM SULFIDES

REPORTED VALUES

Density:	$g\ cm^{-3}$	$lb\ ft^{-3}$
○ US	10.87	678.6
□ US_2	7.90	493
Melting Point:	**K**	**R**
△ β-US_2	2123	3821
▽ US	2273	4091

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	48-1	298		US.	
□	48-1	298		US_2; black.	
△	55-12	2123		β - US_2.	
▽	55-12	2273		US.	

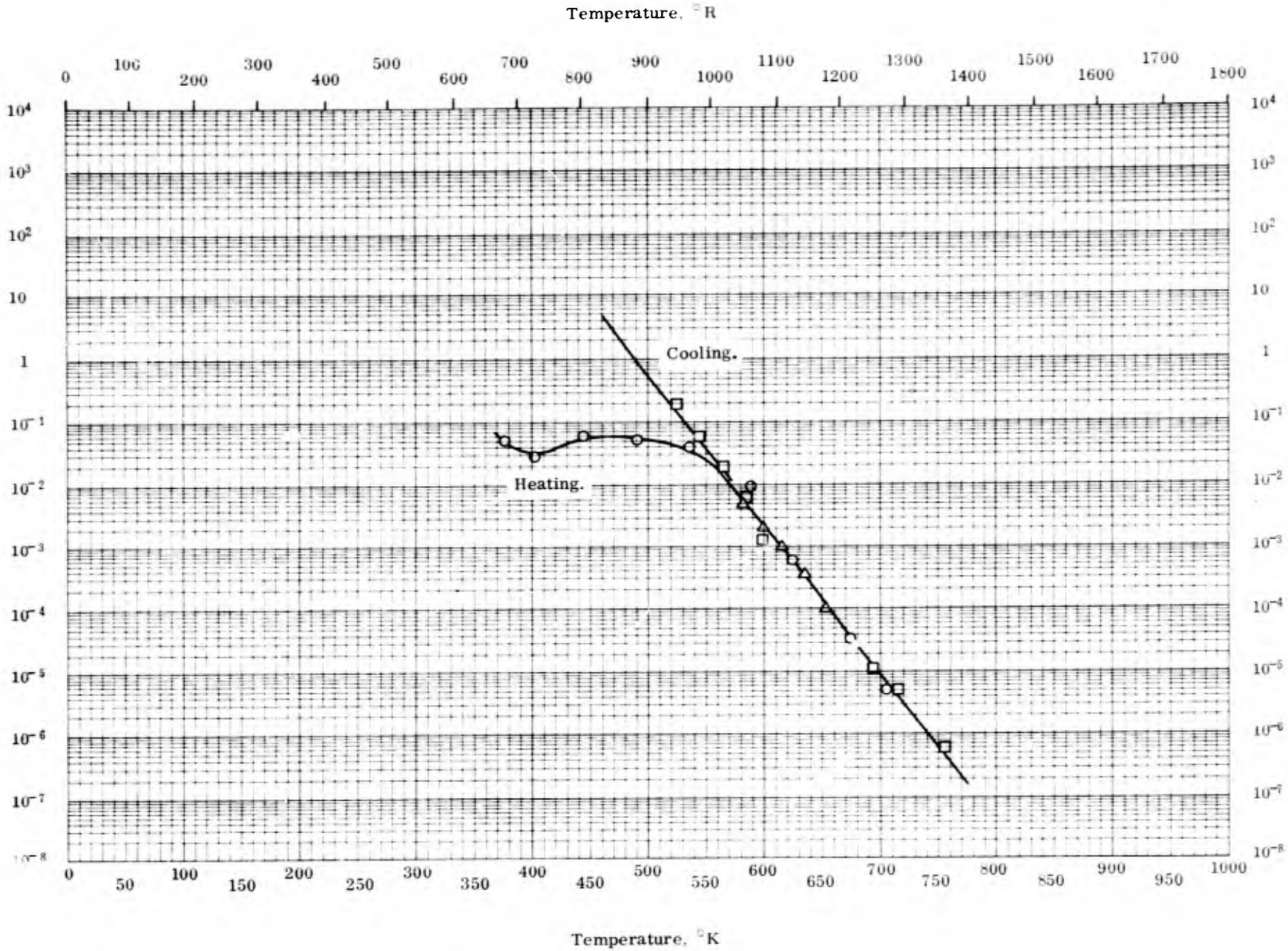


THERMAL LINEAR EXPANSION -- URANIUM MONOSULFIDE

THERMAL LINEAR EXPANSION -- URANIUM MONOSULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-27	293-1223		US.	Specimen prepared from highly reactive uranium (0.0100-0.0600 metallic impurities) produced by hydriding metal turnings at 250 C, decomposed at 550 C, reacted with stoichiometric amount of H_2S (about 99.5 H_2S) at 400 to 500 C, ground to -100 mesh, blended, loosely packed in tungsten crucible in argon atm, homogenized in vacuum (2×10^{-4} to 1×10^{-5} mm Hg) or in inert atm at 1700 to 1800 C, ground to -100 mesh in argon atm, preformed at 15,000 psi in argon atm, isostatically pressed at 55,000 psi with binder of 1 Carbowax and water, and sintered in vacuum or in inert atm at 1700 to 2050 C; measured in vacuum.
□	62-34	273-1273		US.	Specimen prepared from uranium powder obtained from the hydride, reacted with stoichiometric H_2S at 500 to 700 C, homogenized to monosulfide phase at approx 1800 C, pressed into pellets at 55,000 psi, and sintered at 1800 to 2100 C.



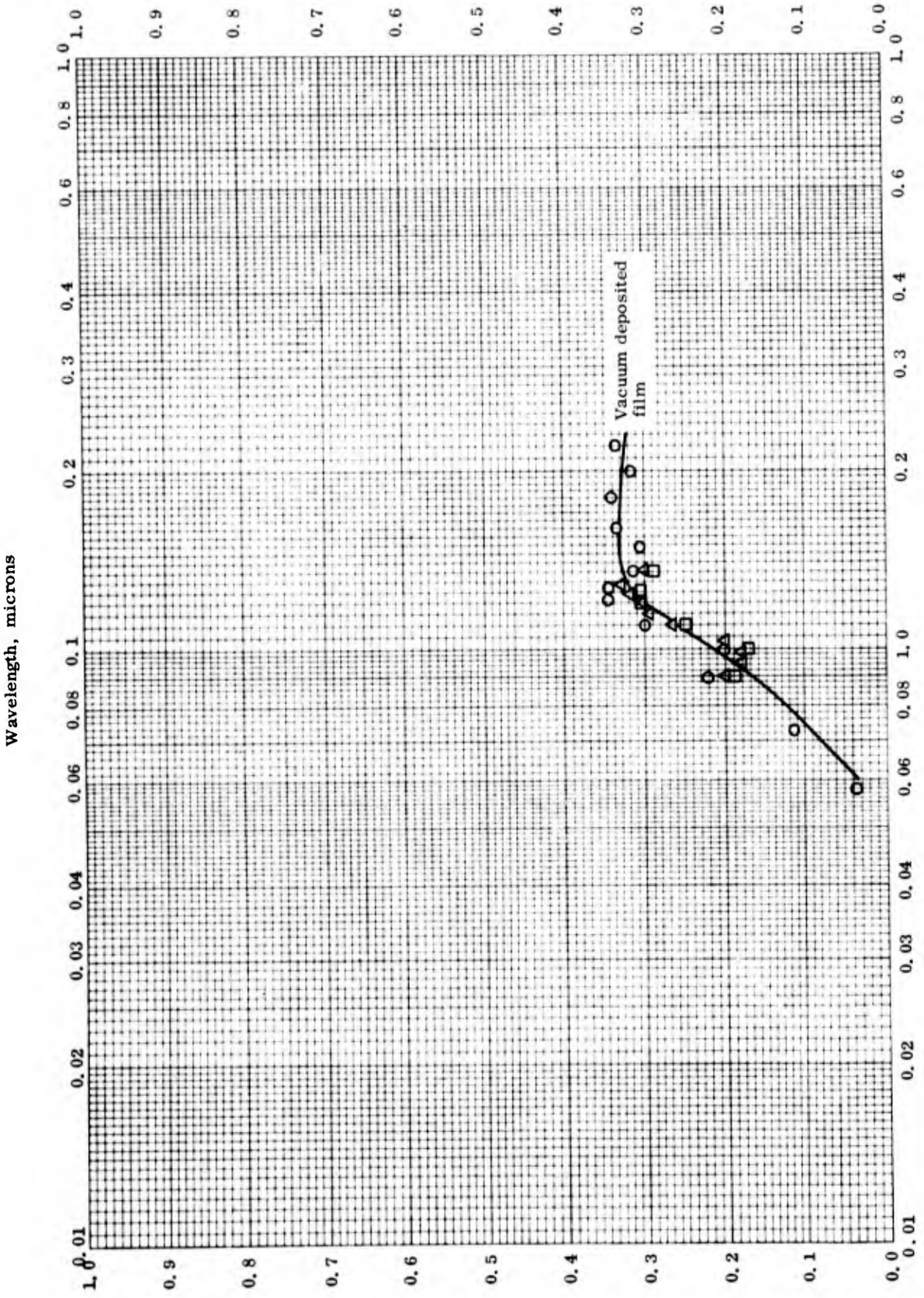
TPRC

ELECTRICAL RESISTIVITY -- ZINC SULFIDE

ELECTRICAL RESISTIVITY -- ZINC SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-9	377-704		Intrinsic hexagonal single crystal.	Initial heating.
□	63-9	526-757		Same as above.	Cooling curve.
△	63-9	581-653		Same as above.	Subsequent heating curve.

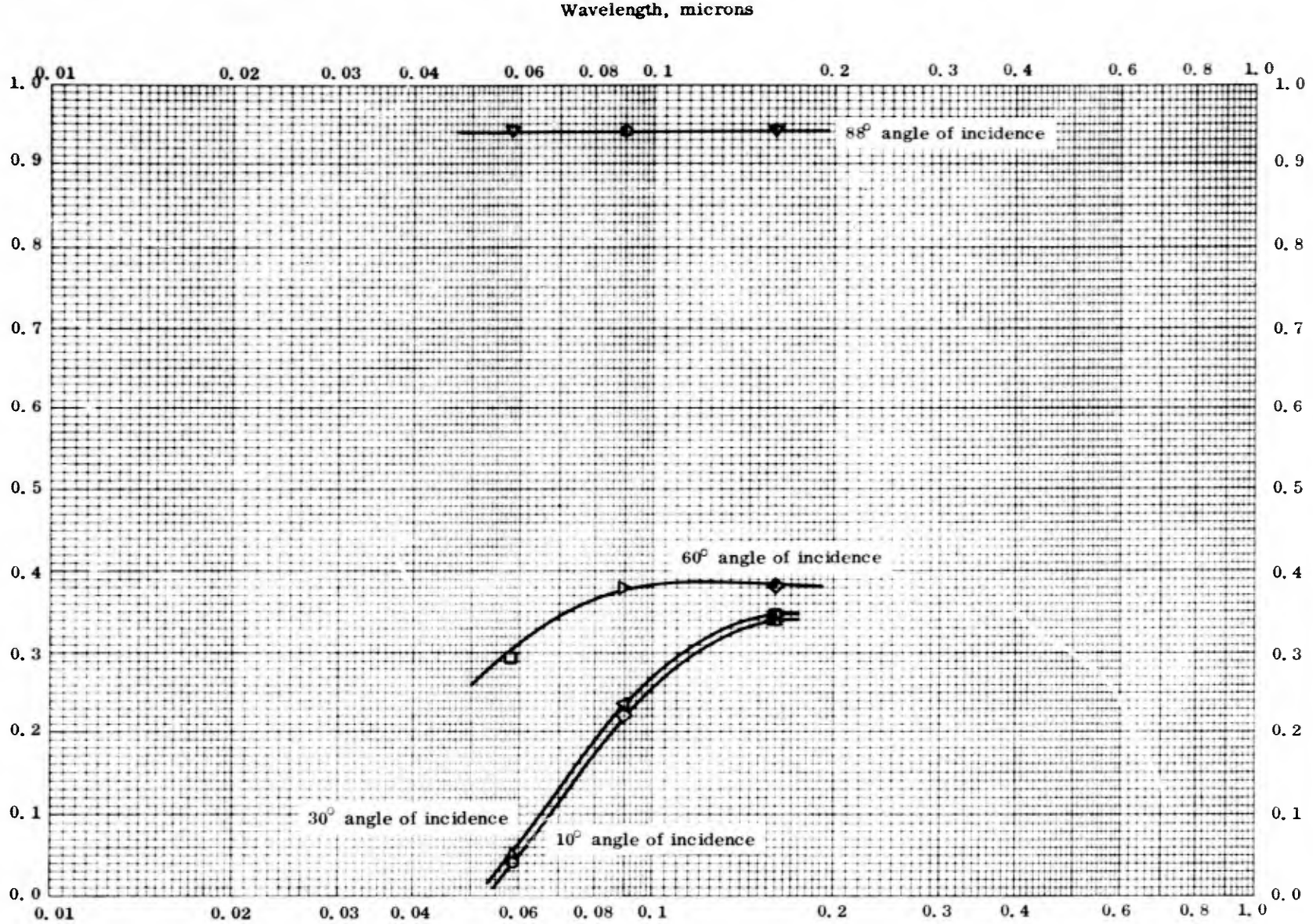


NORMAL SPECTRAL REFLECTANCE -- ZINC SULFIDE

NORMAL SPECTRAL REFLECTANCE -- ZINC SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	59-9	298	0.058-0.22		ZnS, vacuum deposited film of 0.12 μ thickness on a glass substrate by using commercially pure ZnS powder.	6 degree angle of incidence.
△	59-9	298	0.09-0.136		Same as above.	Aged 2 months in air; same as above.
□	59-9	298	0.09-0.136		Same as above.	Aged 2 years in air; same as above.



ANGULAR SPECTRAL REFLECTANCE -- ZINC SULFIDE

ANGULAR SPECTRAL REFLECTANCE -- ZINC SULFIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error%	Sample Specifications	Remarks
○	59-9	298	0.0584		ZnS; vacuum-deposited film of 0.12μ thickness on a glass substrate by using commercially pure ZnS powder.	10 degree angle of incidence.
△	59-9	298	0.0584		Same as above.	30 degree angle of incidence.
□	59-9	298	0.0584		Same as above.	60 degree angle of incidence.
▽	59-9	298	0.0584		Same as above.	88 degree angle of incidence.
◇	59-9	298	0.09		Same as above.	10 degree angle of incidence.
◁	59-9	298	0.09		Same as above.	30 degree angle of incidence.
▷	59-9	298	0.09		Same as above.	60 degree angle of incidence.
◐	59-9	298	0.09		Same as above.	88 degree angle of incidence.
▲	59-9	298	0.16		Same as above.	10 degree angle of incidence.
◧	59-9	298	0.16		Same as above.	30 degree angle of incidence.
◆	59-9	298	0.16		Same as above.	60 degree angle of incidence.
▼	59-9	298	0.16		Same as above.	88 degree angle of incidence.

PROPERTIES OF OTHER METAL SULFIDES

REPORTED VALUES

Density		$g\ cm^{-3}$	$lb\ ft^{-3}$
○	EuS	5.75	358.8
	$EuS_{1.905}$	5.70	355.7
	Eu_3S_4	6.27	391.2
	$\gamma - Gd_2S_3$	6.15	383.8
	GdS_{γ}	5.98	373.2
	$\gamma - Dy_2S_3$	5.91	368.8
	DyS_2	6.11	381.3
	Dy_5S_7	6.35	396.2
	ErS	6.75	421.2
	Er_5S_7	6.21	387.5
	Er_2S_3	6.21	387.5
	Yb_2S_3	6.02	375.6
	Sc_2S_3	2.89	180.3
	YS	4.92	307.0
	Y_5S_7	4.18	260.8
	Y_2S_3	3.82	238.4
	YS_2	4.35	271.4

Melting Point		K	R
□	Dy_2S_3	1753	3156
△	Dy_5S_7	1813	3264
▽	Er_2S_3	2003	3606
◇	Er_2S_3	1903*	3426*
●	Er_5S_7	1893	3408
■	Gd_2S_3	2158	3885
◐	YS_2	1933	3480
◨	YS_2	1933	3480
◧	Y_2S_3	1873	3372
▲	Y_5S_7	1903	3426
▲	YS	2313	4164
◆	YS	2313	4164

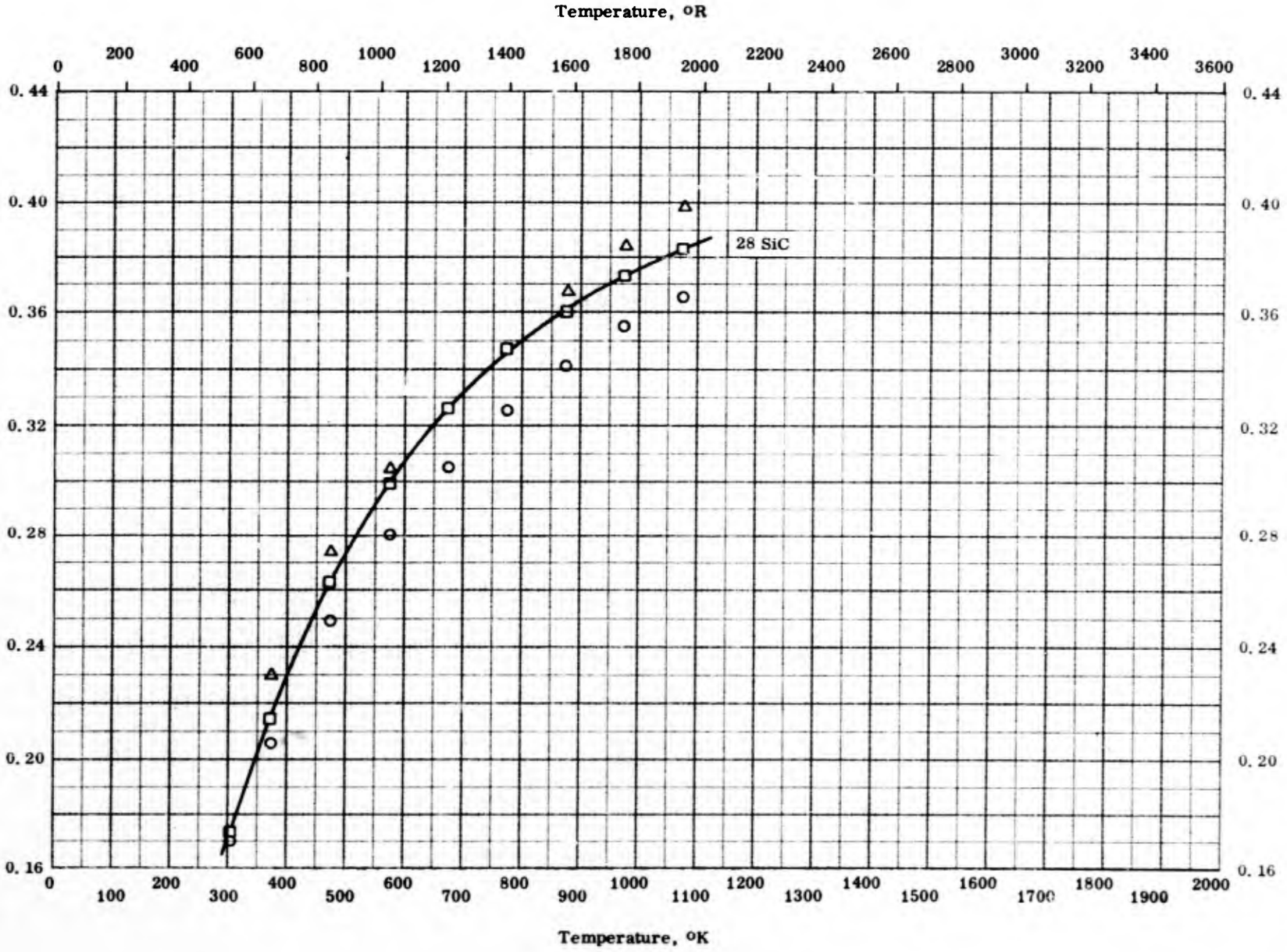
*Most probable value for this compound.

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-44	298		Rare earth sulfides.	
□	61-27	1753		Dy_2S_3.	
◇	61-27	1903		Er_2S_3.	
△	57-26	1813		Dy_5S_7.	
▽	57-26	2003		Er_2S_3.	
●	57-26	1893		Er_5S_7.	
■	57-26	2158		Gd_2S_3.	
◐	59-19	1933		YS_2.	
◨	56-9	1933		YS_2.	
◧	56-16	1873		Y_2S_3.	
▲	56-16	1903		Y_5S_7.	
▲	56-15	2313		YS.	
◆	56-10	2313		YS.	

MIXTURES OF ELEMENTS, OXIDES AND NONOXIDES -- EXCLUDING MIXTURES LISTED BY SPECIFIC CATEGORIES

(Major constituent is < 95.0 percent, or any other constituent is > 2.0 percent)

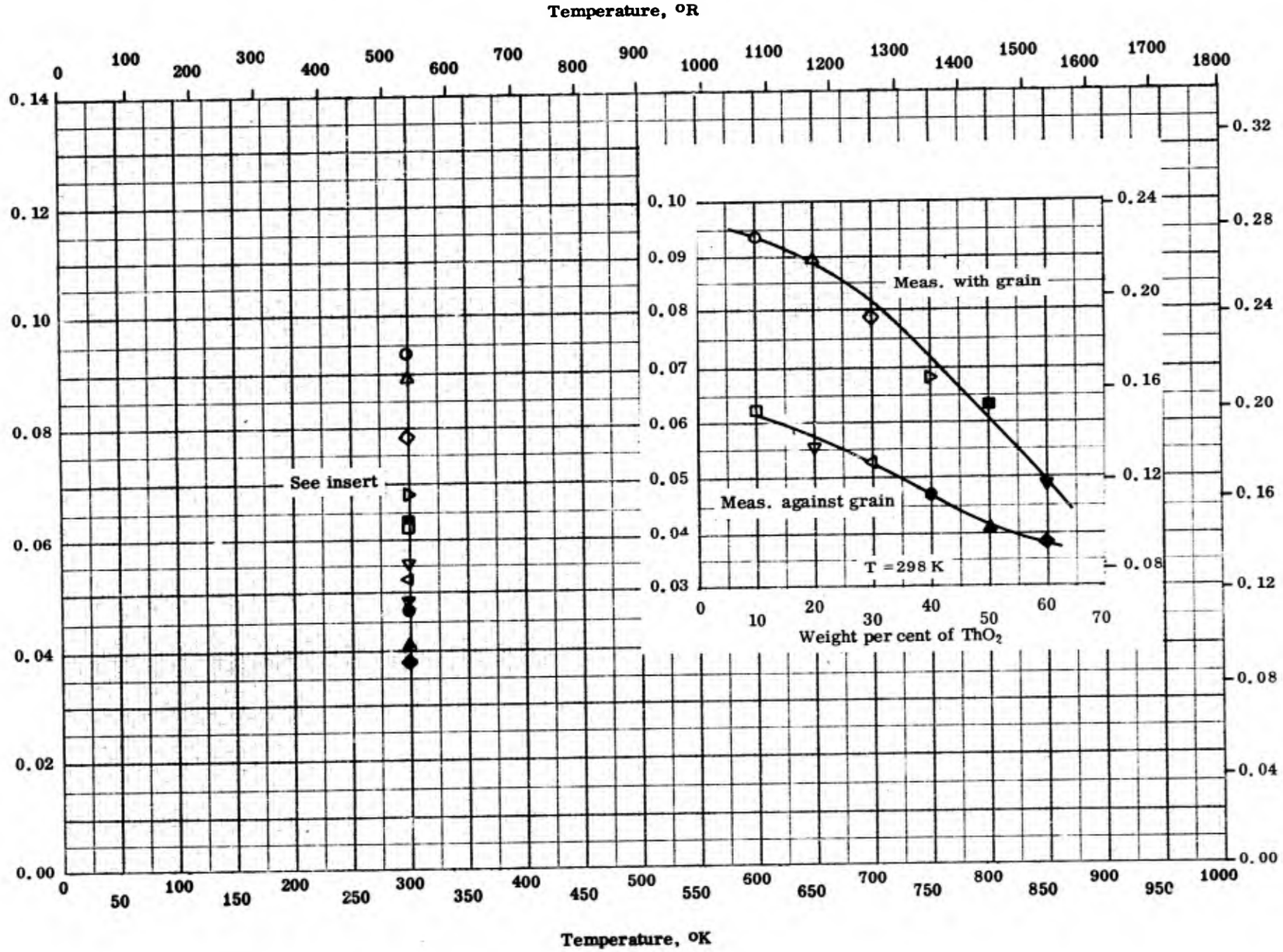


SPECIFIC HEAT -- GRAPHITE + SILICON CARBIDE

SPECIFIC HEAT -- GRAPHITE + SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	<3	57 C and 43 SiC.	
□	62-21	303-1073	<3	72 C and 28 SiC.	
△	62-21	303-1073	<3	77 C and 23 SiC.	

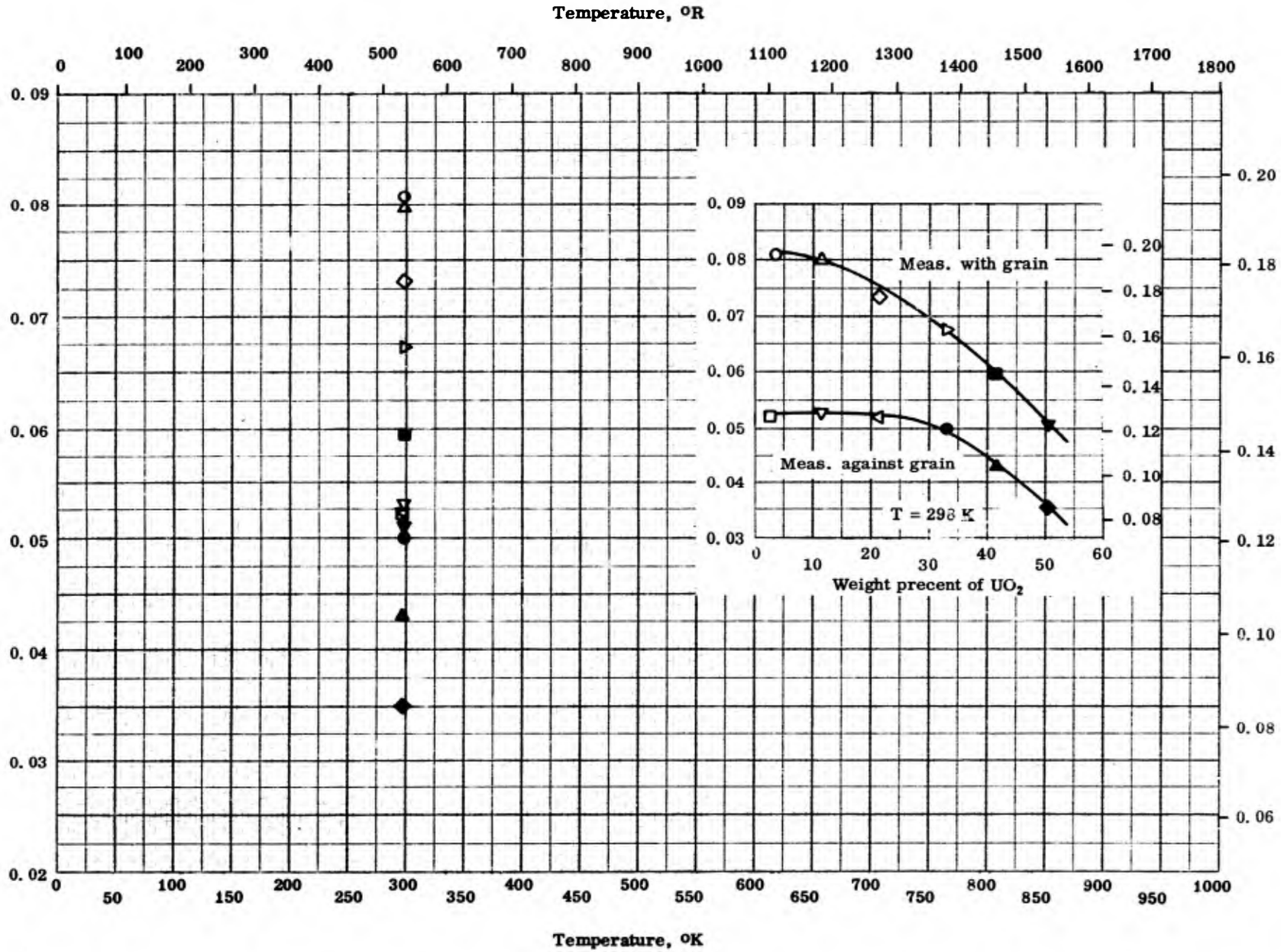


THERMAL CONDUCTIVITY -- GRAPHITE + THORIUM DIOXIDE

THERMAL CONDUCTIVITY -- GRAPHITE + THORIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	59-1	298		89.96 C and 10.04 ThO_2; bulk density 1.827 g cm^{-3}.	Baked to 1425 C; measured with the grain.
□	59-1	298		Same as above.	Same as above; measured against the grain.
△	59-1	298		80.05 C and 19.95 ThO_2; bulk density 1.971 g cm^{-3}.	Baked to 1425 C; measured with the grain.
▽	59-1	298		Same as above.	Same as above; measured against the grain.
◇	59-1	298		70.03 C and 29.97 ThO_2; bulk density 2.149 g cm^{-3}.	Baked to 1425 C; measured with the grain.
◁	59-1	298		Same as above.	Same as above; measured against the grain.
▷	59-1	298		60.07 C and 39.93 ThO_2; bulk density 2.369 g cm^{-3}.	Baked to 1425 C; measured with the grain.
●	59-1	298		Same as above.	Same as above; measured against the grain.
■	59-1	298		49.94 C and 50.06 ThO_2; bulk density 2.624 g cm^{-3}.	Baked to 1425 C; measured with the grain.
▲	59-1	298		Same as above.	Same as above; measured against the grain.
▼	59-1	298		39.83 C and 60.17 ThO_2; bulk density 2.951 g cm^{-3}.	Baked to 1425 C; measured with the grain.
◆	59-1	298		Same as above.	Same as above; measured against the grain.

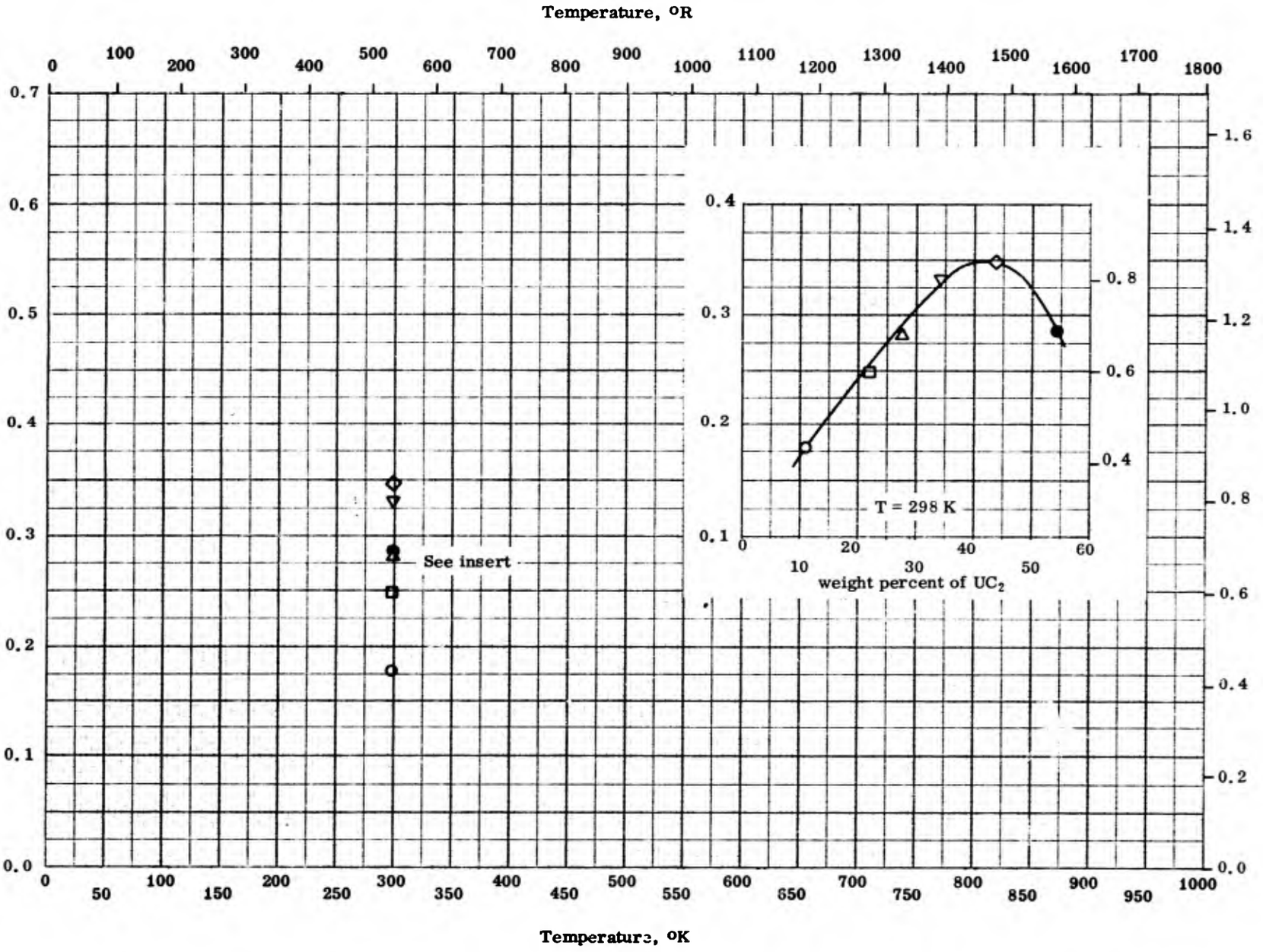


THERMAL CONDUCTIVITY -- GRAPHITE + URANIUM DIOXIDE

THERMAL CONDUCTIVITY -- GRAPHITE + URANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	59-1	298		96.96 C and 3.31 UO_2; bulk density 1.724 g cm^{-3}.	Baked to 1425 C; measured with the grain.
□	59-1	298		Same as above.	Same as above; measured against the grain.
△	59-1	298		88.89 C and 11.11 UO_2; bulk density 1.832 g cm^{-3}.	Baked to 1425 C; measured with the grain.
▽	59-1	298		Same as above.	Same as above; measured against the grain.
◇	59-1	298		78.47 C and 21.53 UO_2; bulk density 2.007 g cm^{-3}.	Baked to 1425 C; measured with the grain.
◁	59-1	298		Same as above.	Same as above, measured against the grain.
▷	59-1	298		67.05 C and 32.95 UO_2; bulk density 2.224 g cm^{-3}.	Baked to 1425 C; measured with the grain.
●	59-1	298		Same as above.	Same as above; measured against the grain.
■	59-1	298		58.61 C and 41.39 UO_2; bulk density 2.441 g cm^{-3}.	Baked to 1425 C; measured with the grain.
▲	59-1	298		Same as above.	Same as above; measured against the grain.
▼	59-1	298		49.35 C and 50.65 UO_2; bulk density 2.686 g cm^{-3}.	Baked to 1425 C; measured with the grain.
◆	59-1	298		Same as above.	Same as above; measured against the grain.

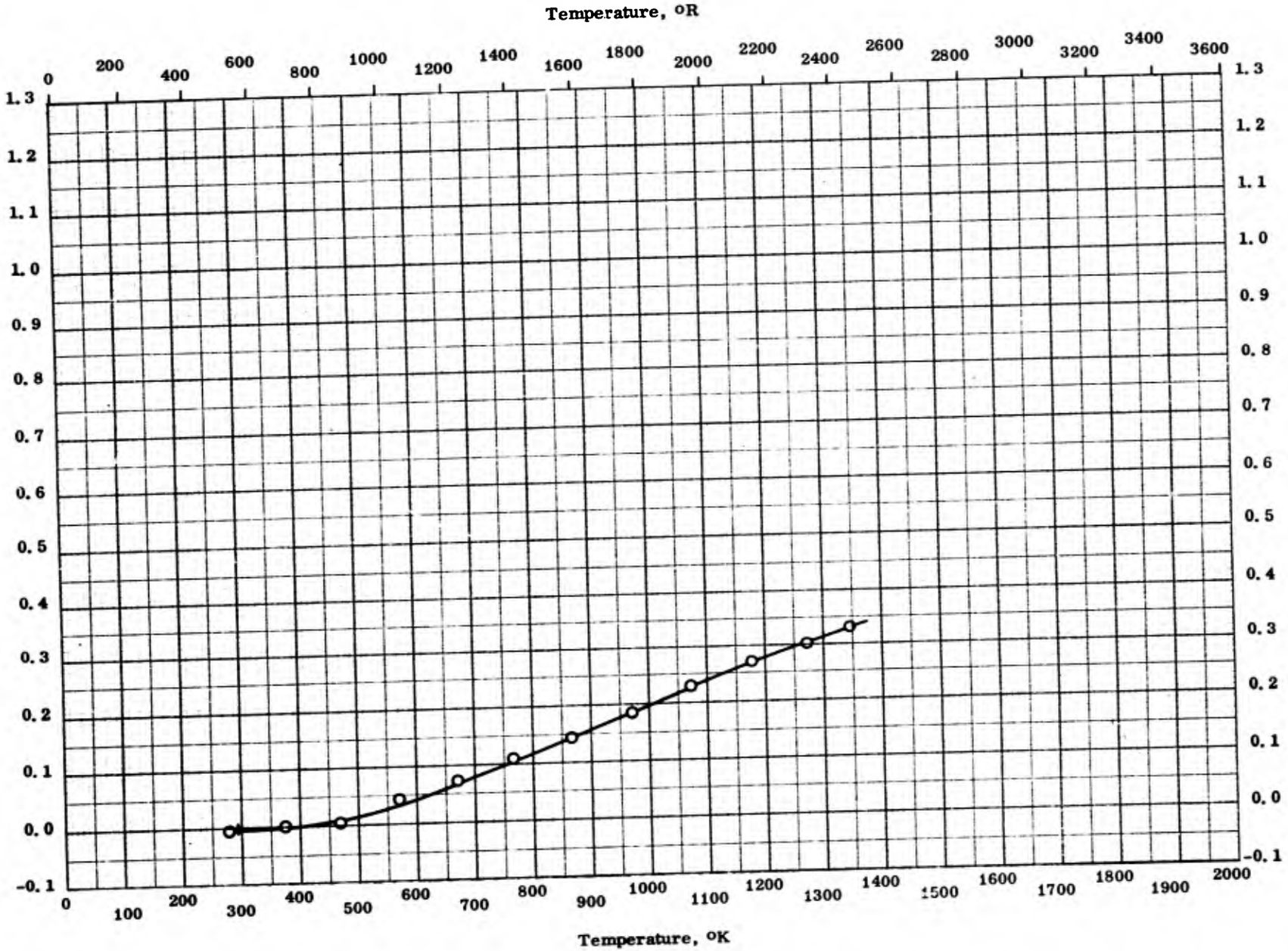


THERMAL CONDUCTIVITY -- GRAPHITE + URANIUM DICARBIDE

THERMAL CONDUCTIVITY -- GRAPHITE +URANIUM DICARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	59-1	298		88.96 C and 11.04 UC_2; bulk density 1.866 g cm^{-3}.	Baked to 2800 C.
□	59-1	298		78.07 C and 21.93 UC_2; bulk density 1.986 g cm^{-3}.	Baked to 2800 C.
△	59-1	298		72.52 C and 27.48 UC_2; bulk density 2.067 g cm^{-3}.	Baked to 2800 C.
▽	59-1	298		65.92 C and 34.08 UC_2; bulk density 2.157 g cm^{-3}.	Baked to 2800 C.
◇	59-1	298		56.13 C and 43.87 UC_2; bulk density 2.333 g cm^{-3}.	Baked to 2800 C.
●	59-1	298		45.26 C and 54.74 UC_2; bulk density 2.526 g cm^{-3}.	Baked to 2800 C.

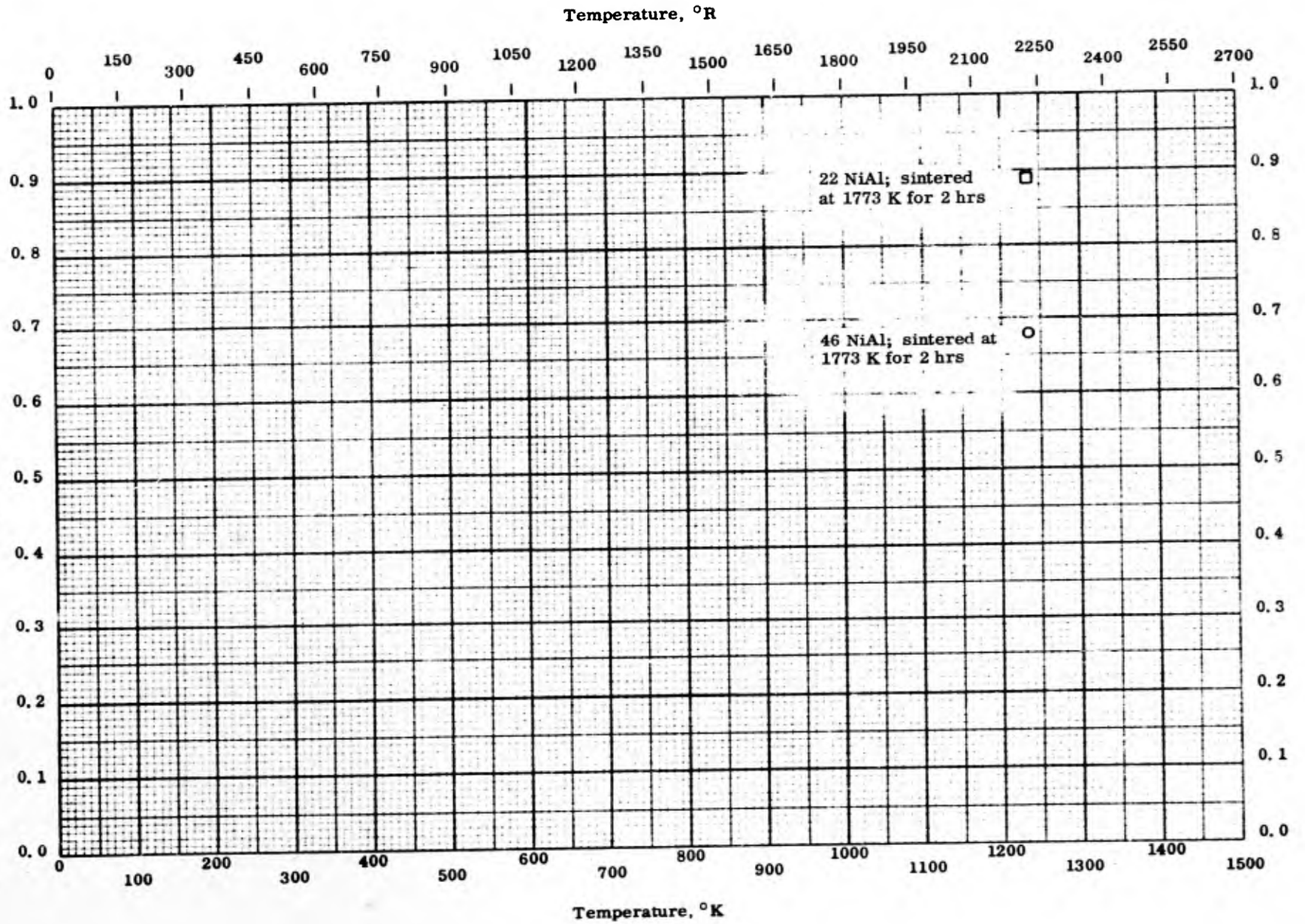


THERMAL LINEAR EXPANSION — PYROLYTIC GRAPHITE + ZIRCONIUM PYROCARBIDE

THERMAL LINEAR EXPANSION -- PYROLYTIC GRAPHITE + ZIRCONIUM PYROCARBIDE

REFERENCE INFORMATION

Symbol	Ref	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-42	283-1348		92 C; zirconium pyrocarbide and pyrolytic graphite.	Measured parallel to a-direction.

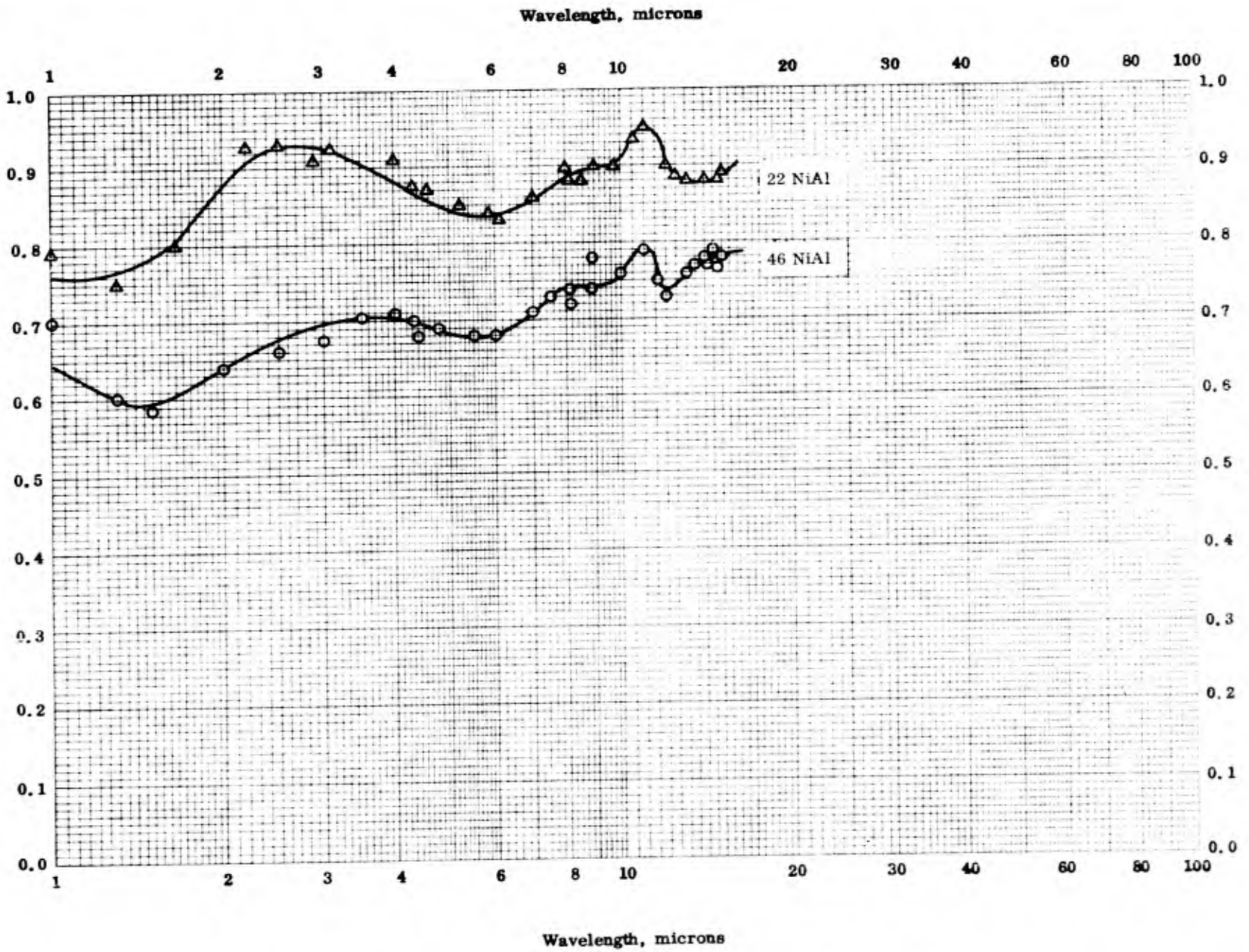


NORMAL TOTAL EMITTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

NORMAL TOTAL EMITTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	54 Al_2O_3 and 46 Ni Al; 0.048 in. thickness plate; density 3.05 g cm^{-3}.	Sintered at 1773 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
□	63-18	1223	± 8	78 Al_2O_3 and 22 Ni Al; 0.084 in. thickness plate.	Same as above.

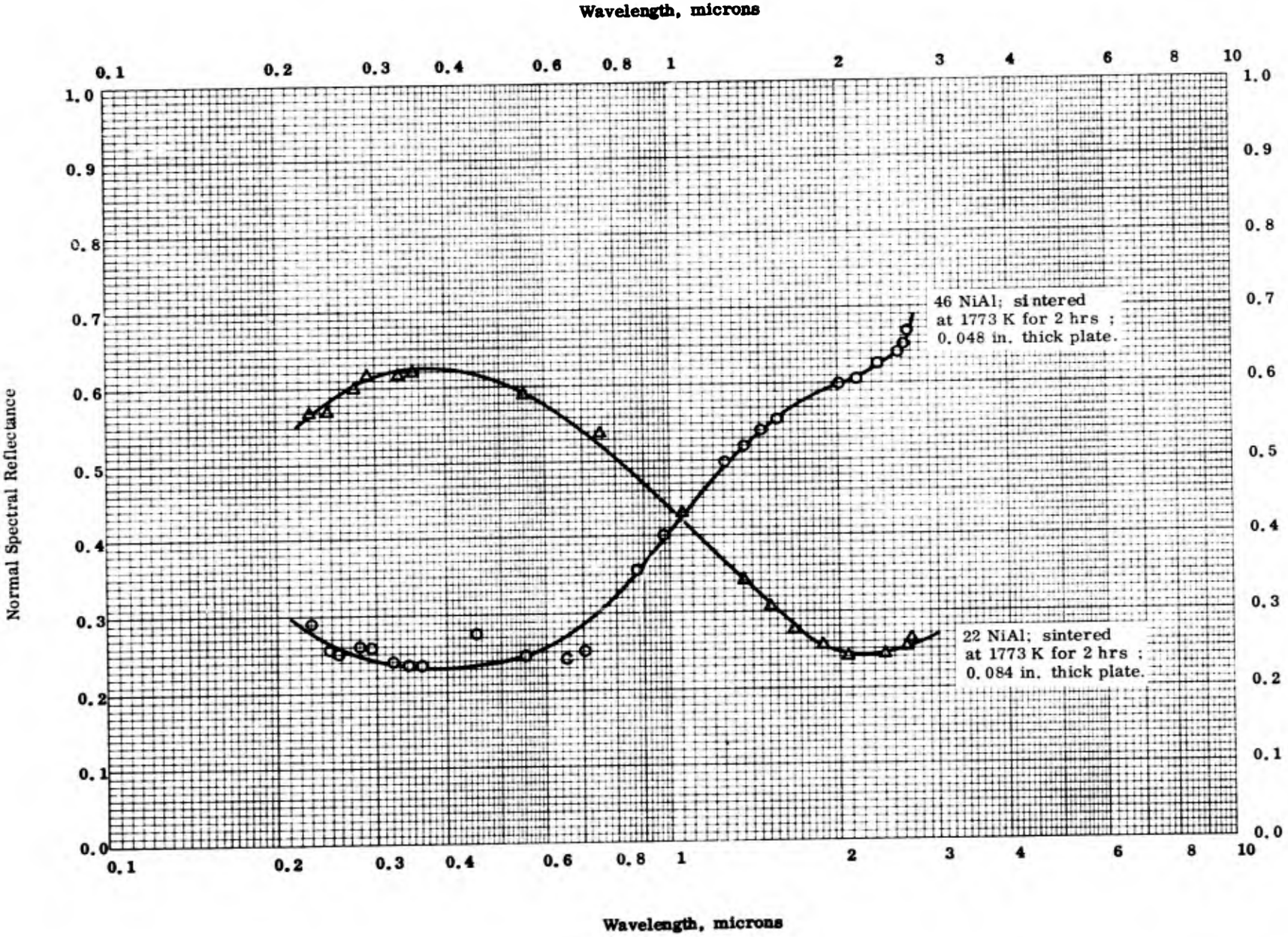


NORMAL SPECTRAL EMITTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

NORMAL SPECTRAL EMITTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	1-15		54 Al_2O_3 and 46 Ni Al; 0.048 in. thickness plate; density 3.05 g cm^{-3}.	Sintered at 1773 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
Δ	63-18	1223	1-15		78 Al_2O_3 and 22 Ni Al; 0.084 in. thickness plate; density 3.05 g cm^{-3}.	Same as above.

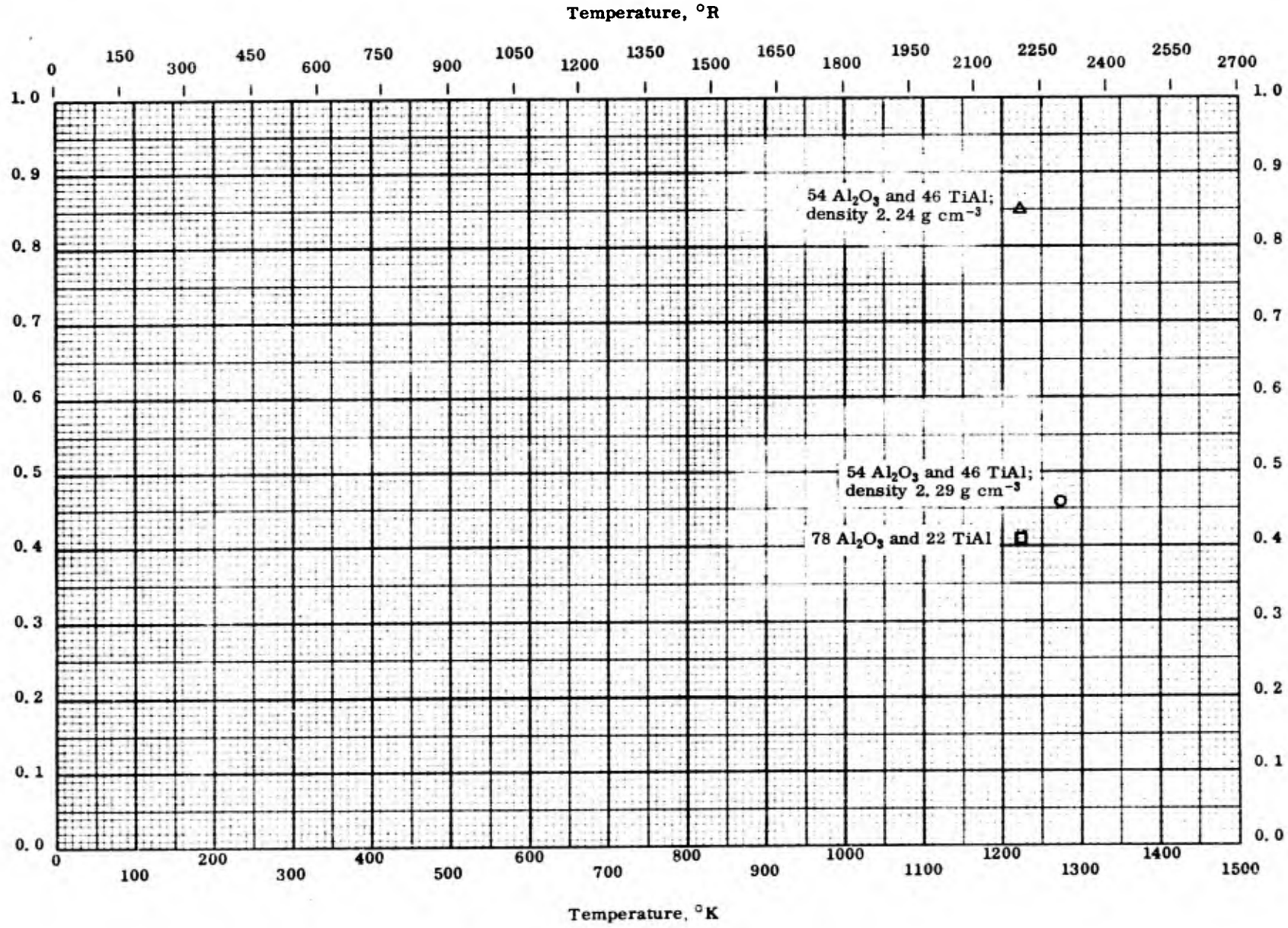


NORMAL SPECTRAL REFLECTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

NORMAL SPECTRAL REFLECTANCE -- ALUMINUM OXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	54 Al_2O_3 and 46 Ni Al; 0.048 in. thickness plate; density 3.05 g cm^{-3}.	Sintered at 1773 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	78 Al_2O_3 and 22 Ni Al; 0.084 in. thickness plate; density 3.05 g cm^{-3}.	Same as above.



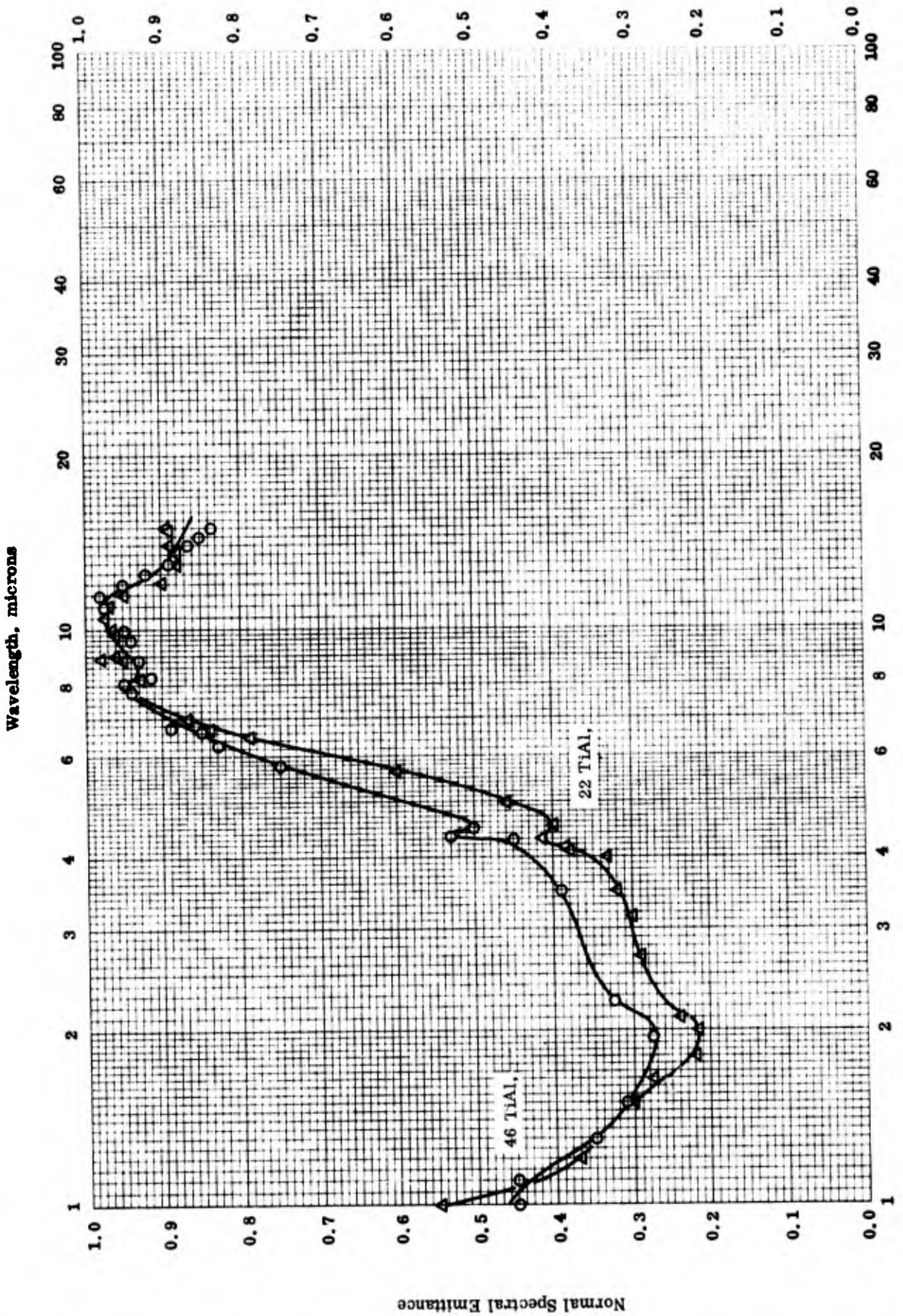
NORMAL TOTAL EMITTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	± 8	54 Al_2O_3 and 46 TiAl; 0.070 in. thickness plate; density 2.29 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon; calculated from spectral data.
△	63-18	1223	± 8	54 Al_2O_3 and 46 TiAl; 0.050 in. thickness plate; density 2.24 g cm^{-3}.	Same as above.
□	63-18	1223	± 8	78 Al_2O_3 and 22 TiAl; 0.047 in. thickness plate; density 2.14 g cm^{-3}.	Same as above.

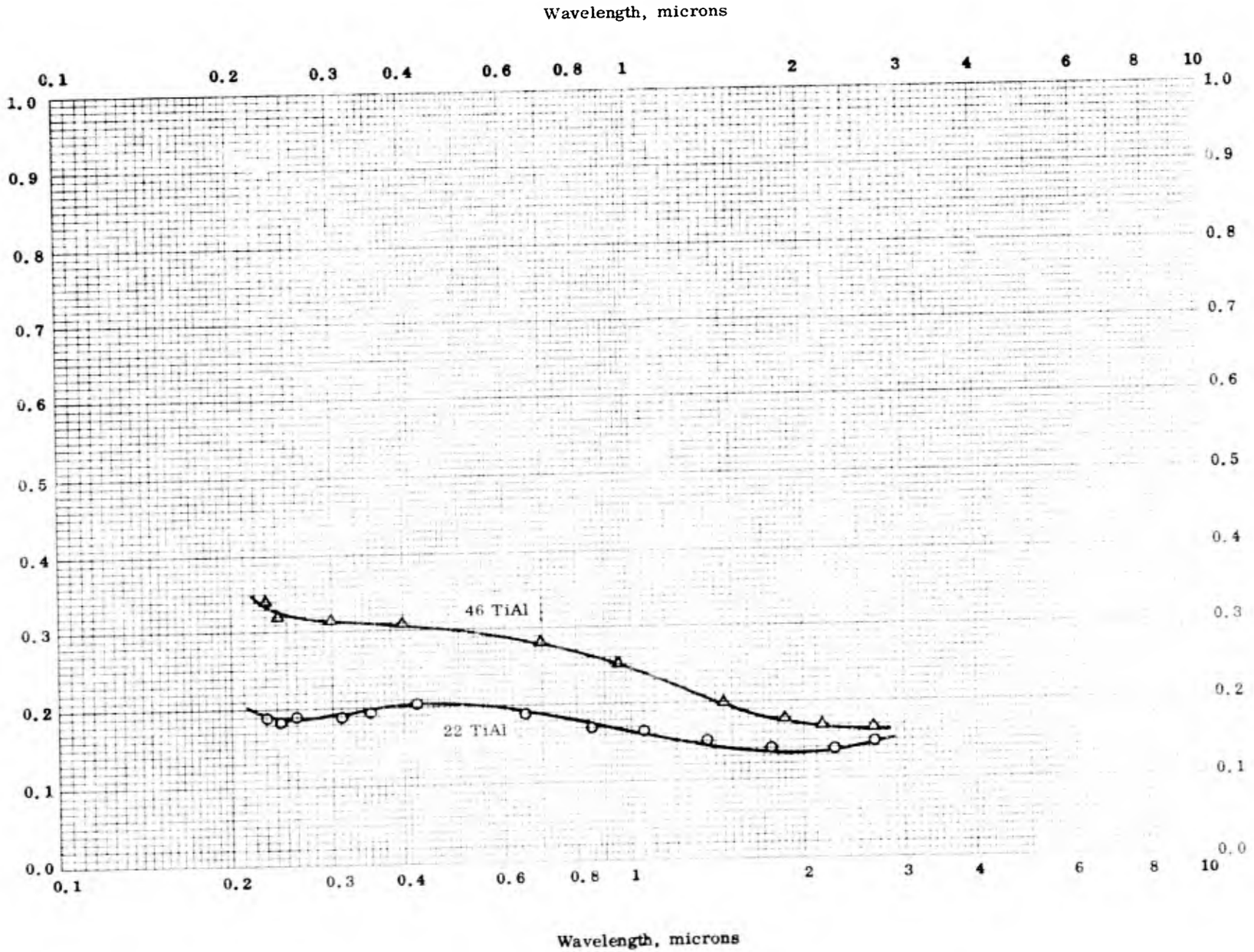


NORMAL SPECTRAL EMITTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

NORMAL SPECTRAL EMITTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	1-15		54 Al_2O_3 and 46 TiAl; 0.07 in. thickness plate; density 2.29 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon; data taken from a curve.
△	63-18	1223	1-15		78 Al_2O_3 and 22 TiAl; 0.047 in. thickness plate; density 2.14 g cm^{-3}.	Same as above.

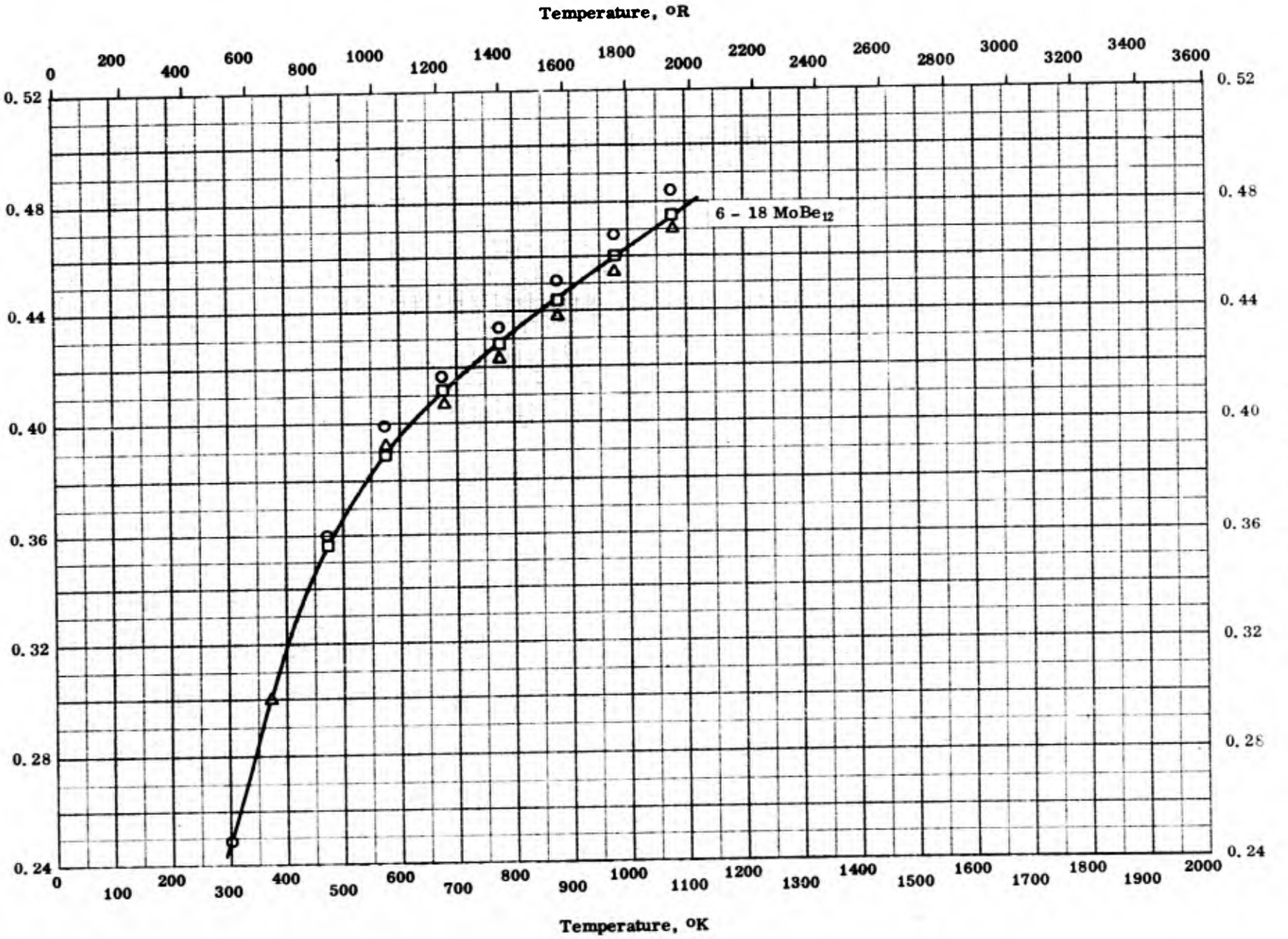


NORMAL SPECTRAL REFLECTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

NORMAL SPECTRAL REFLECTANCE -- ALUMINUM OXIDE + TITANIUM ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	54 Al_2O_3 and 46 TiAl; 0.05 in. thickness plate; density 2.24 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	78 Al_2O_3 and 22 TiAl; 0.047 in. thickness plate; density 2.14 g cm^{-3}.	Same as above.



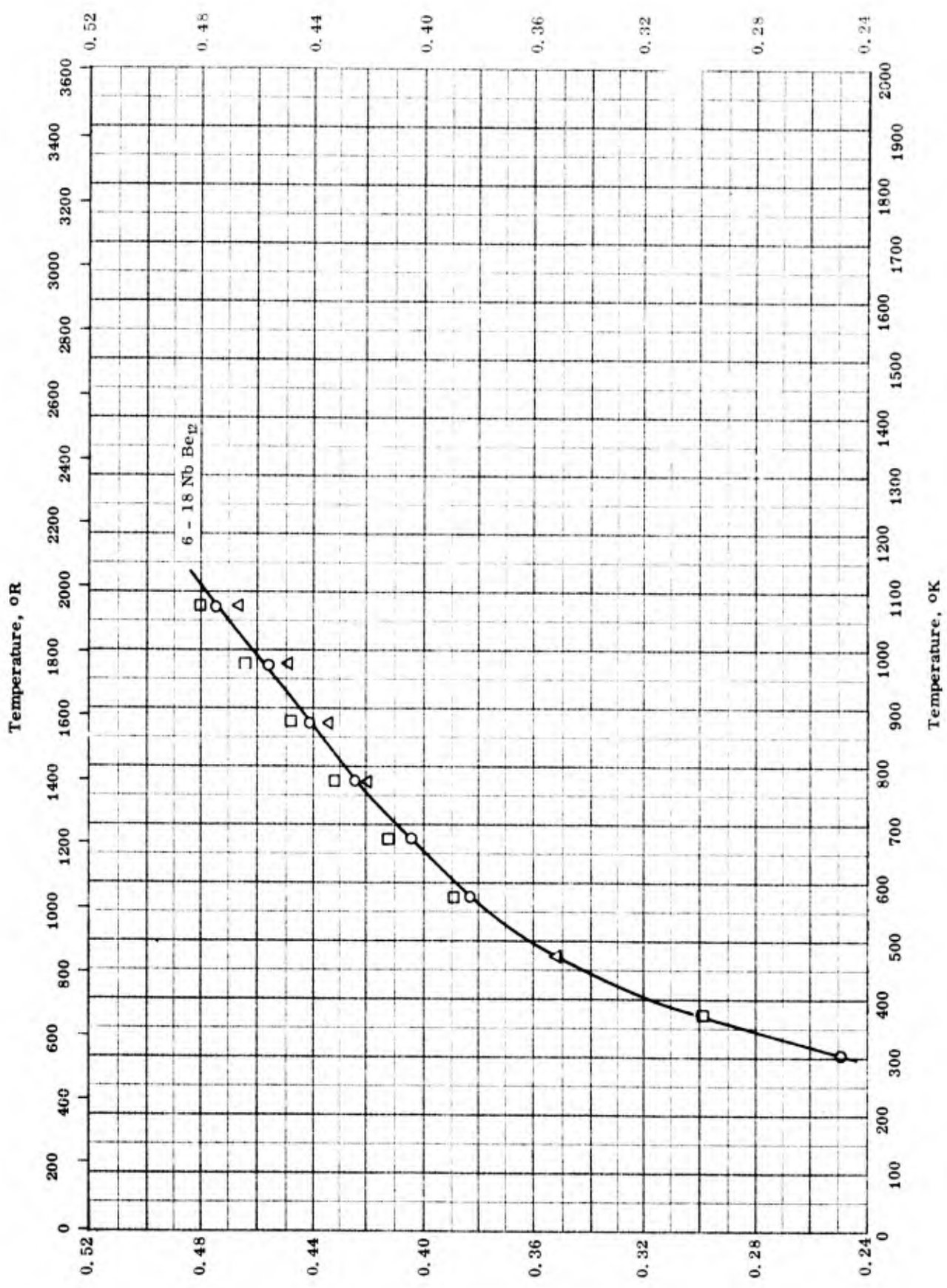
SPECIFIC HEAT -- BERYLLIUM OXIDE + MOLYBDENUM BERYLLIDE

SPECIFIC HEAT -- BERYLLIUM OXIDE + MOLYBDENUM BERYLLIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	<3	94 BeO and 6 $MoBe_{12}$.	
□	62-21	303-1073	<3	91 BeO and 9 $MoBe_{12}$.	
△	62-21	303-1073	<3	82 BeO and 18 $MoBe_{12}$.	

TPRC



SPECIFIC HEAT -- BERYLLIUM OXIDE + NIOBIUM BERYLLIDE

SPECIFIC HEAT -- BERYLLIUM OXIDE + NIOBIUM BERYLLIDE

REFERENCE INFORMATION

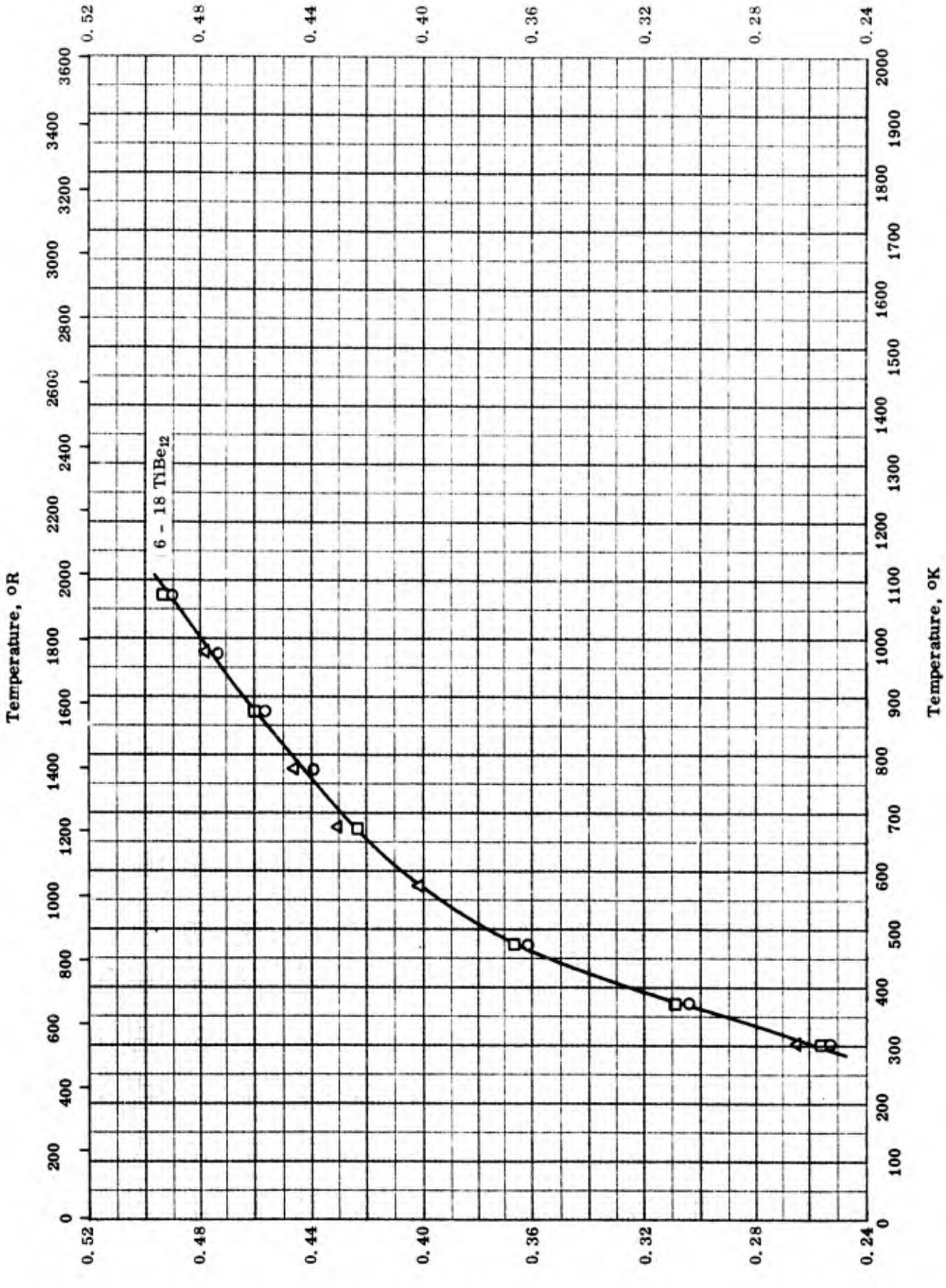
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	< 3	94 BeO and 6 $NbBe_{12}$.	
□	62-21	303-1073	< 3	91 BeO and 9 $NbBe_{12}$.	
△	62-21	303-1073	< ?	82 BeO and 18 $NbBe_{12}$.	

SPECIFIC HEAT -- BERYLLIUM OXIDE + TANTALUM BERYLLIDE

SPECIFIC HEAT -- BERYLLIUM OXIDE + TANTALUM BERYLLIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	<3	94 BeO and 6 $TaBe_{12}$.	
□	62-21	303-1073	<3	91 BeO and 9 $TaBe_{12}$.	
△	62-21	303-1073	<3	82 BeO and 18 $TaBe_{12}$.	

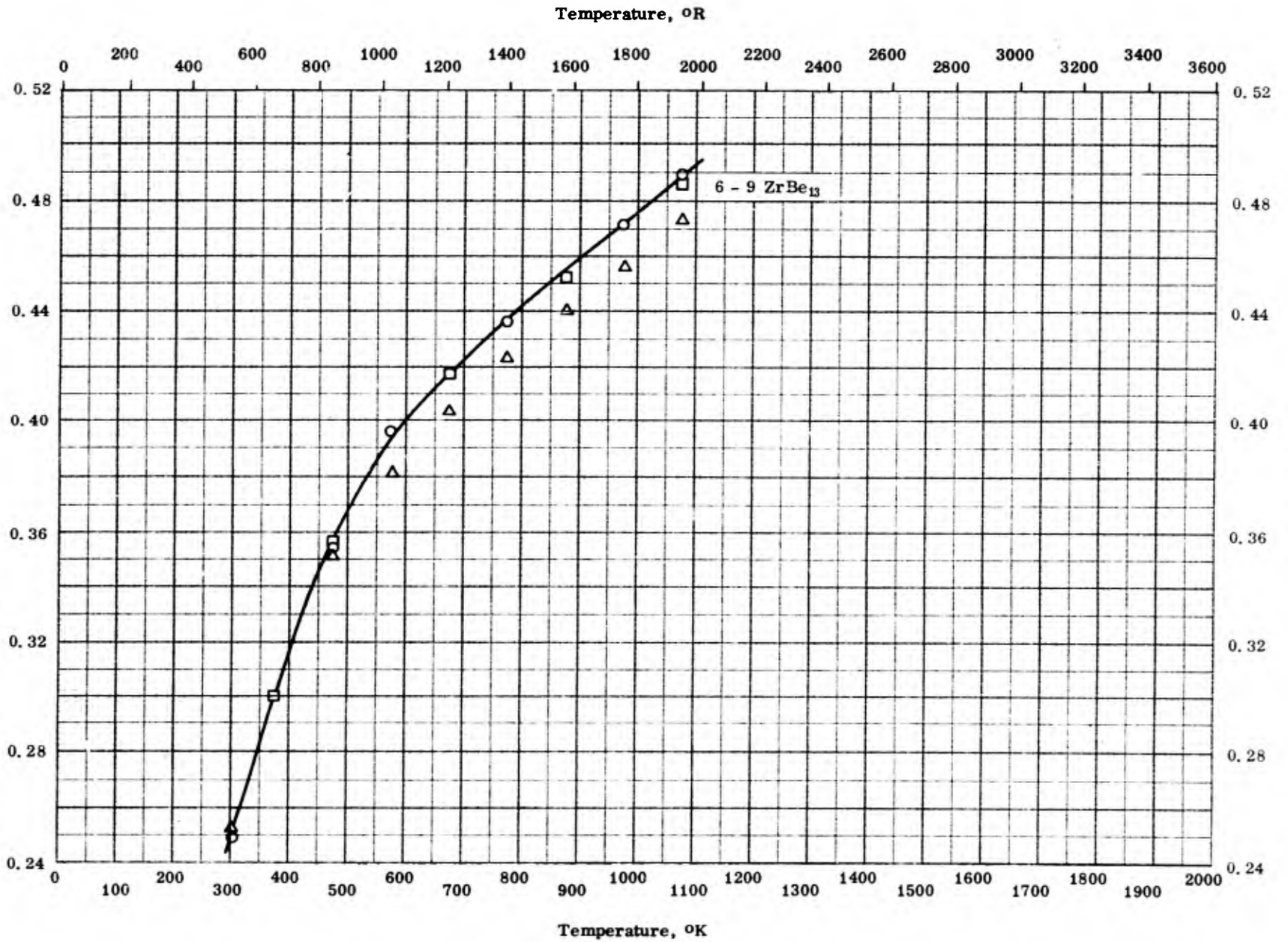


SPECIFIC HEAT -- BERYLLIUM OXIDE + TITANIUM BERYLLIDE

SPECIFIC HEAT -- BERYLLIUM OXIDE + TITANIUM BERYLLIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	<3	94 BeO and 6 $TiBe_{12}$.	
□	62-21	303-1073	<3	91 BeO and 9 $TiBe_{12}$.	
△	62-21	303-1073	<3	82 BeO and 18 $TiBe_{12}$.	

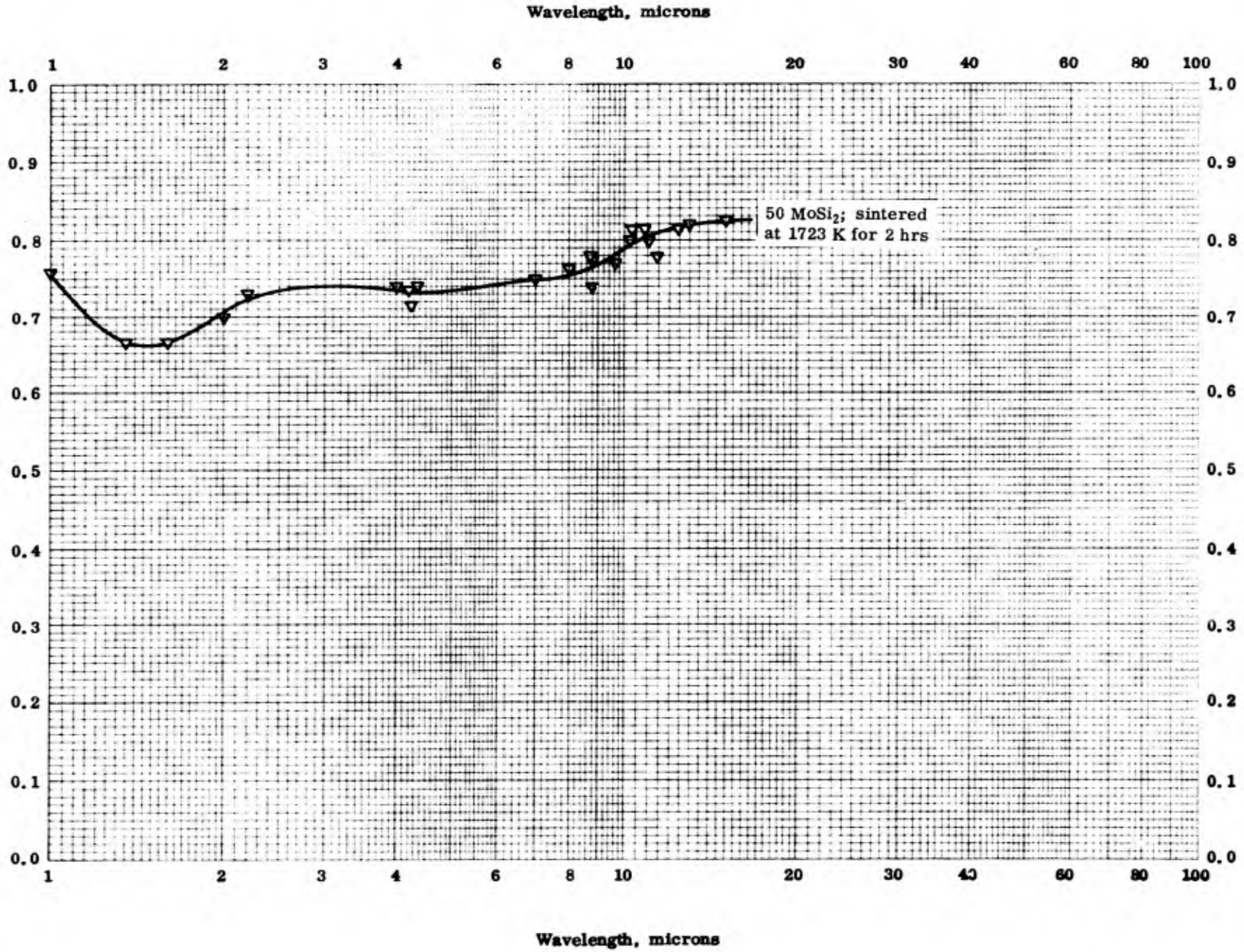


SPECIFIC HEAT -- BERYLLIUM OXIDE + ZIRCONIUM BERYLLIDE

SPECIFIC HEAT -- BERYLLIUM OXIDE + ZIRCONIUM BERYLLIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-21	303-1073	<3	94 BeO and 6 $ZrBe_{13}$.	
□	62-21	303-1073	<3	91 BeO and 9 $ZrBe_{13}$.	
△	62-21	303-1073	<3	82 BeO and 18 $ZrBe_{13}$.	

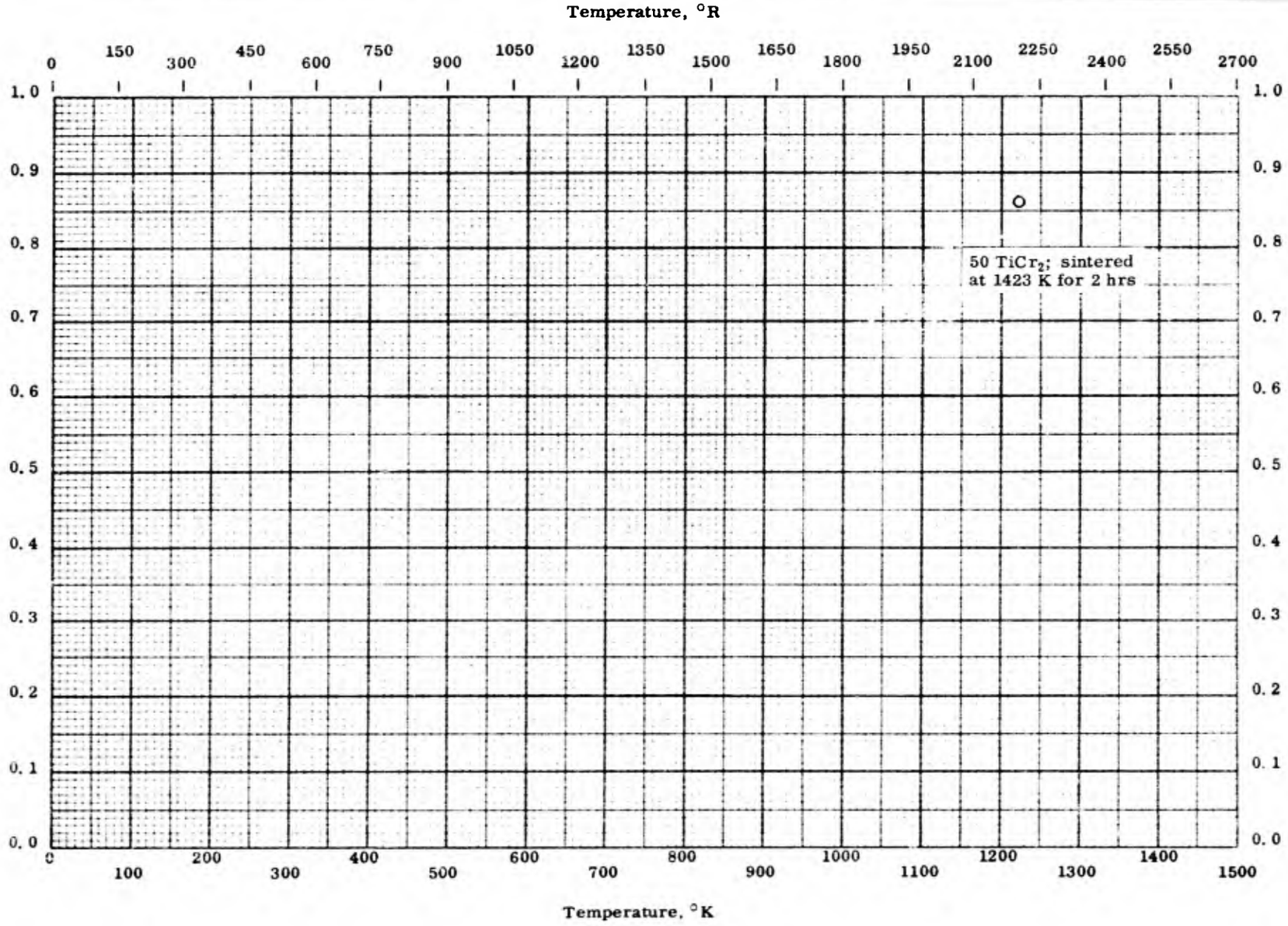


NORMAL SPECTRAL EMITTANCE -- CHROMIUM SESQUIOXIDE + MOLYBDENUM DISILICIDE

NORMAL SPECTRAL EMITTANCE -- CHROMIUM SESQUIOXIDE + MOLYBDENUM DISILICIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range μ	Rept. Error%	Sample Specifications	Remarks
▽	62-35	1273	1-15	8.9	50 Cr_2O_3 and 50 $MoSi_2$; 0.046 in. thickness plate.	Sintered at 1723 K for 2 hrs; measured in air.

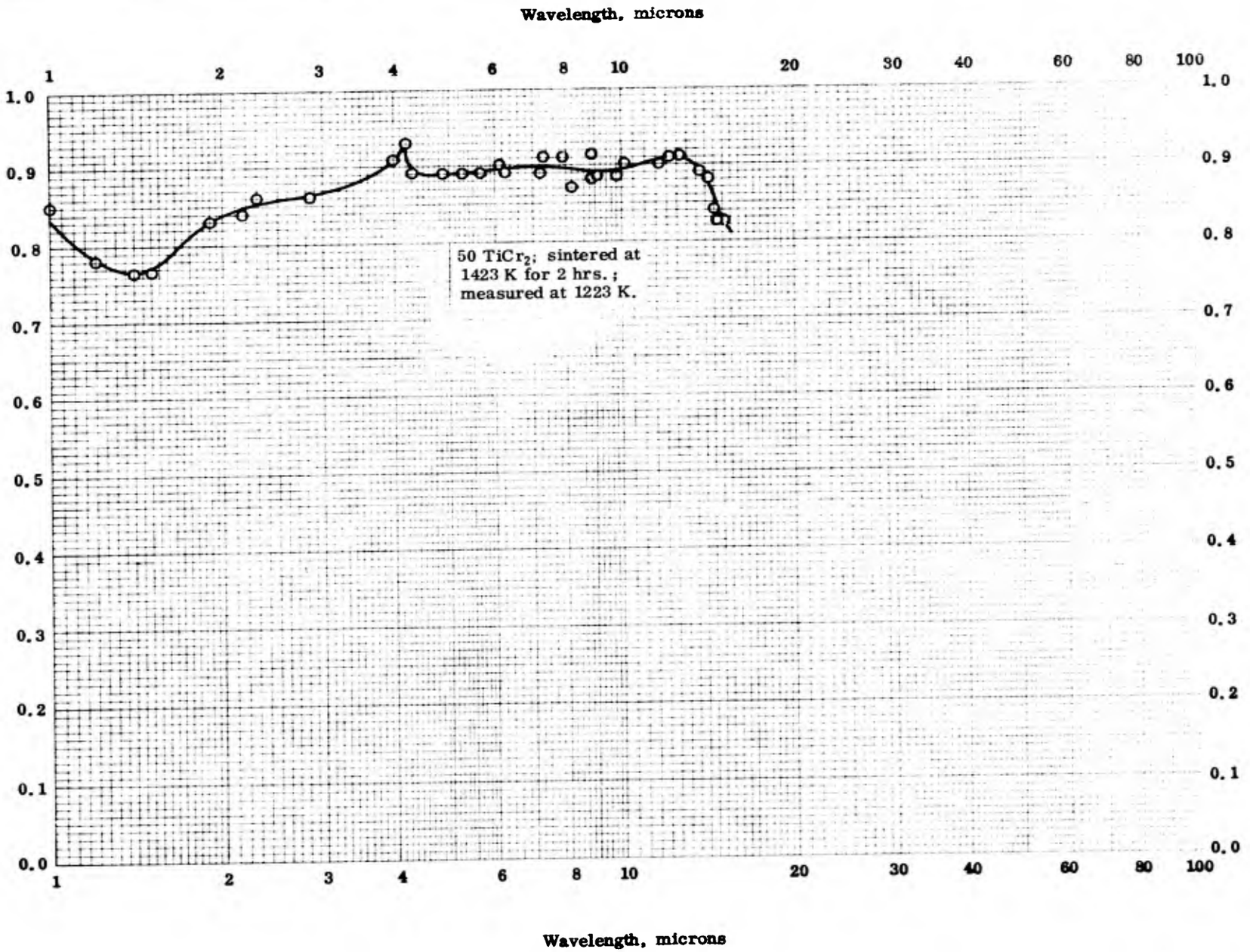


NORMAL TOTAL EMITTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

NORMAL TOTAL EMITTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	50 Cr_2O_3 and 50 $TiCr_2$; 0.045 in. thickness plate; density 5.40 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon; calculated from spectral data.

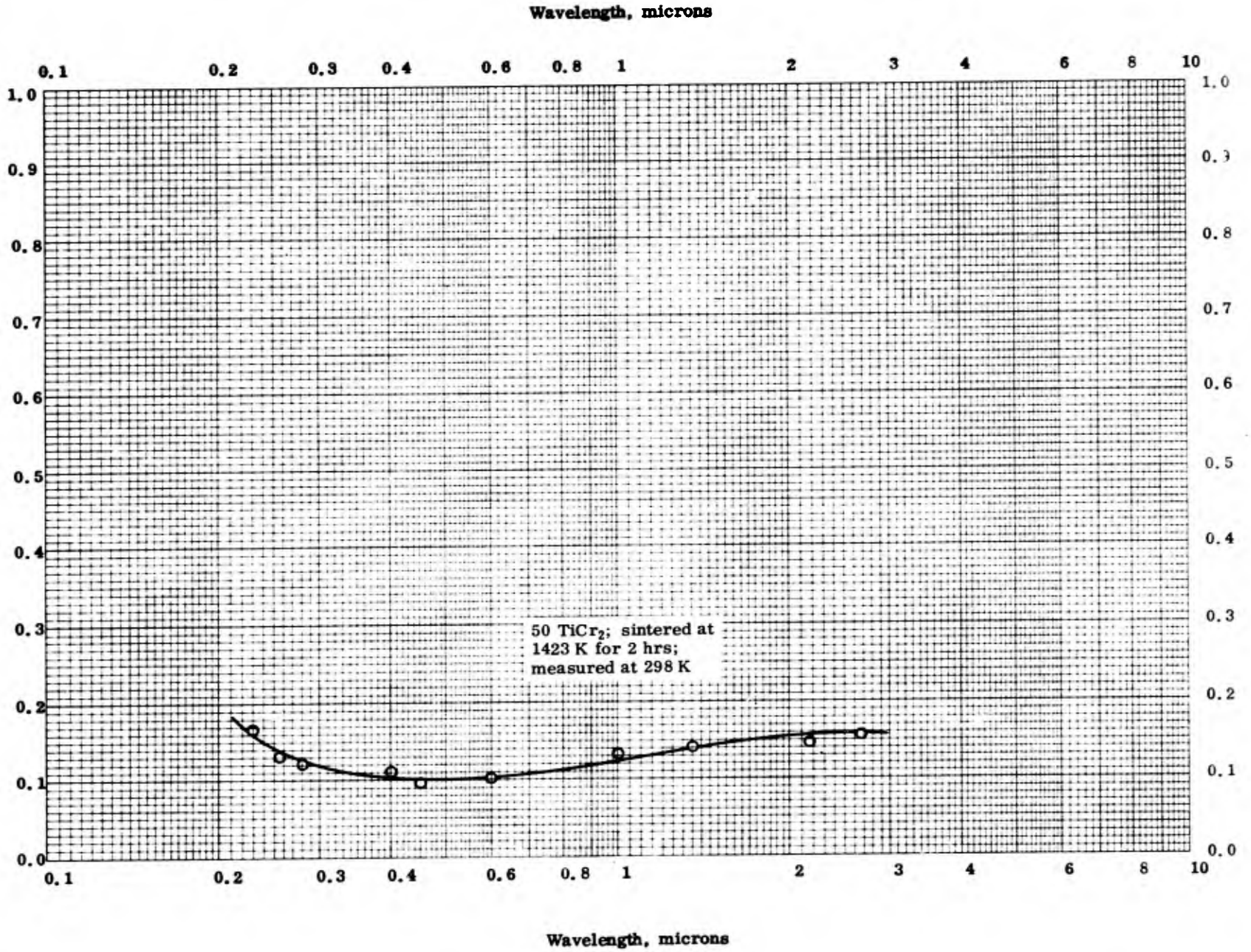


NORMAL SPECTRAL EMITTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

NORMAL SPECTRAL EMITTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	1-15		50 Cr_2O_3 and 50 $TiCr_2$; 0.045 in. thickness plate; density 3.40 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon; data taken from a curve.

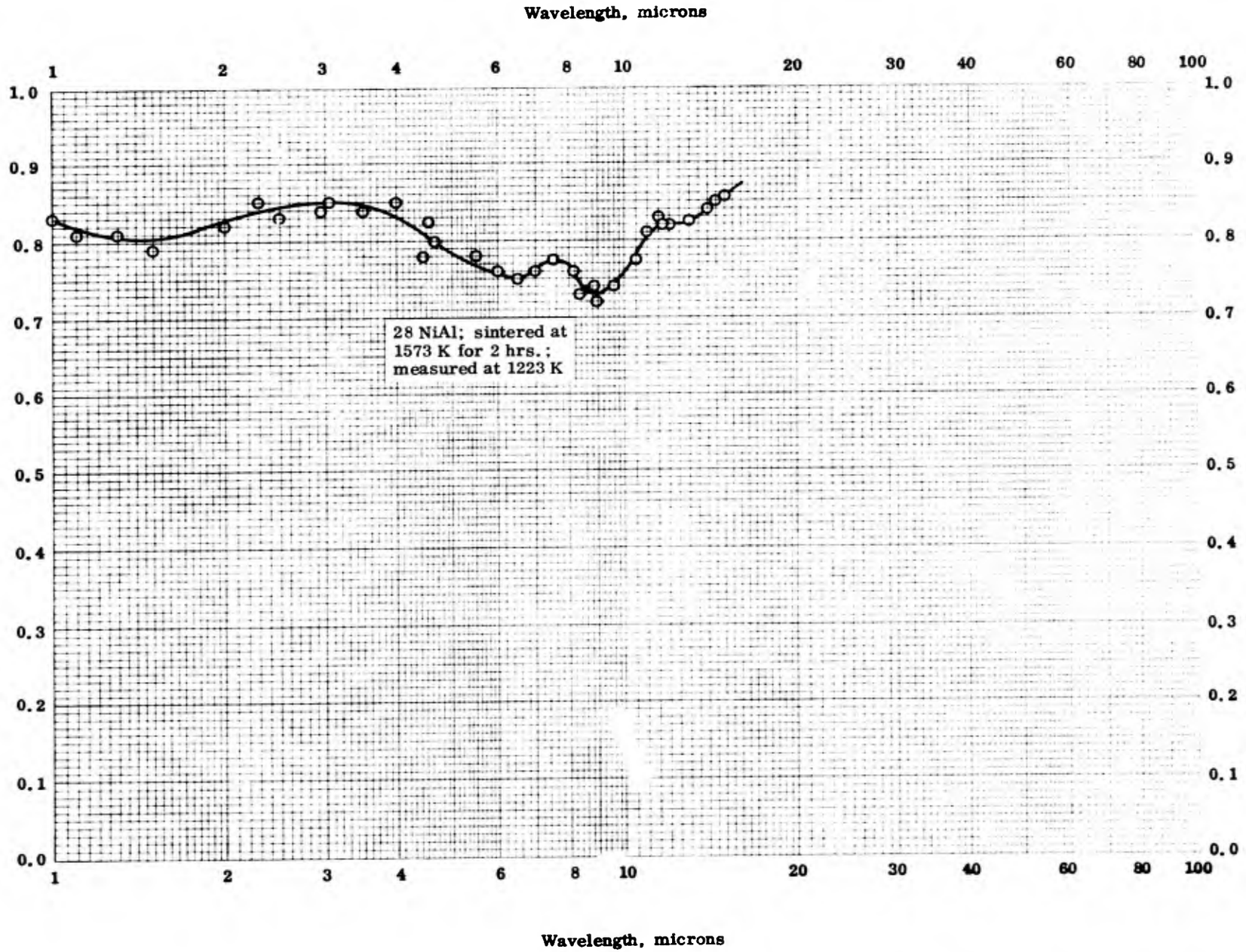


NORMAL SPECTRAL REFLECTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

NORMAL SPECTRAL REFLECTANCE -- CHROMIUM SESQUIOXIDE + TITANIUM - CHROMIUM INTERMETALLICS

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	50 Cr_2O_3 and 50 $TiCr_2$; 0.045 in. thickness plate; density 3.40 g cm^{-3}.	Sintered at 1423 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.



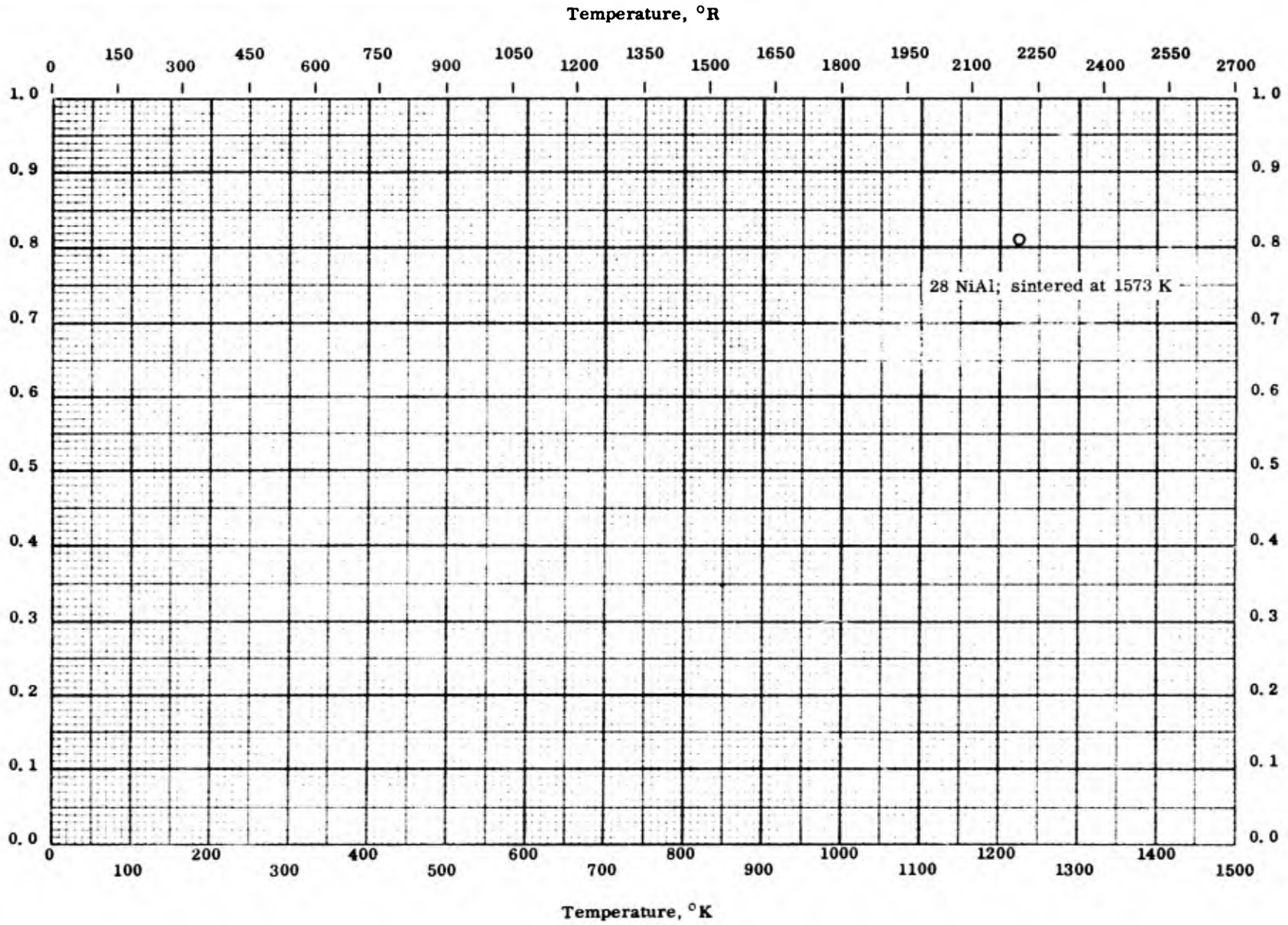
NORMAL SPECTRAL EMITTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	1-15		72 NiO and 28 NiAl; 0.04 in. thickness plate; density 4.4 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve.



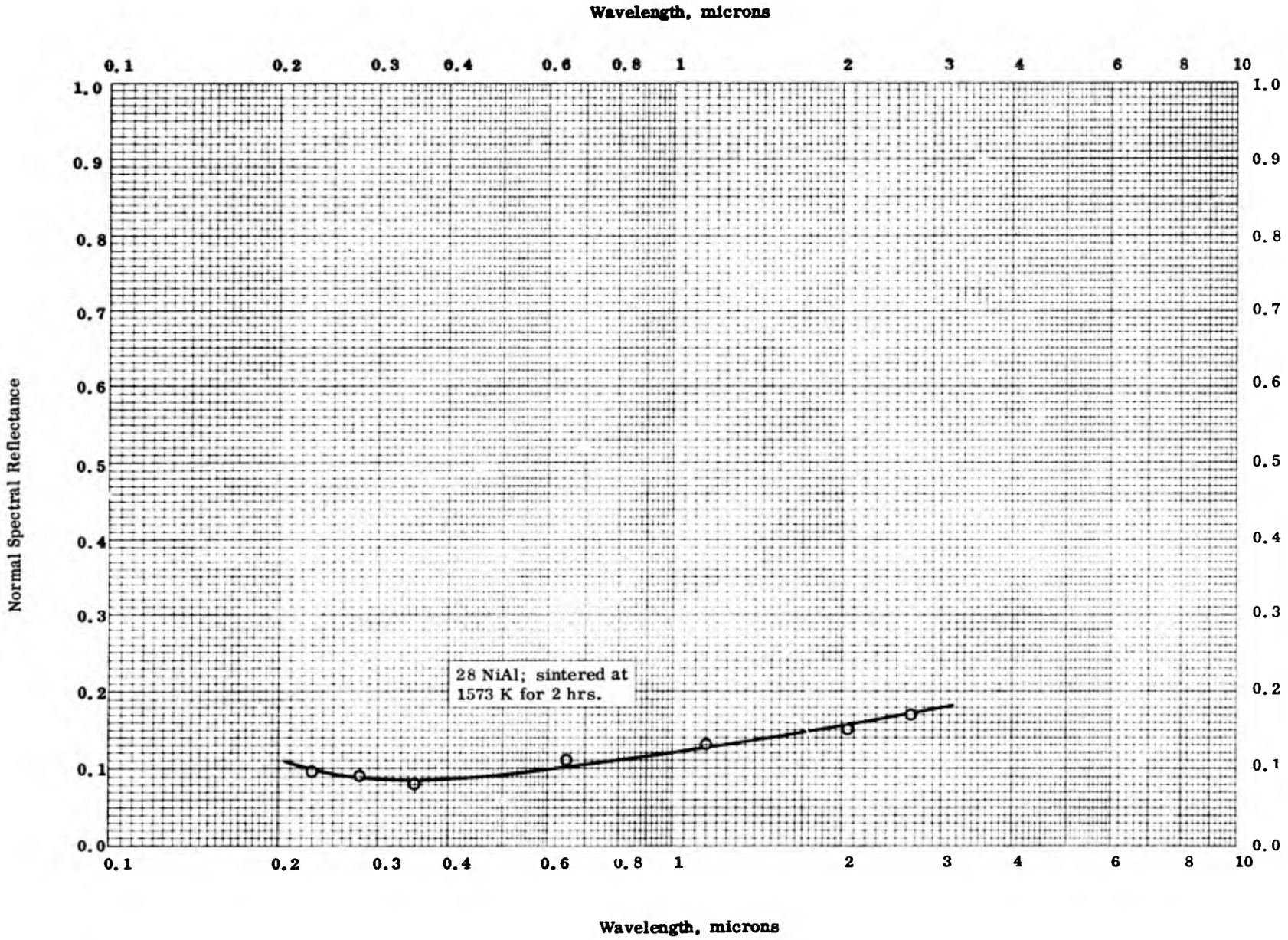
NORMAL TOTAL EMITTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	72 NiO and 28 NiAl; 0.04 in. thickness plate; density 4.40 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.



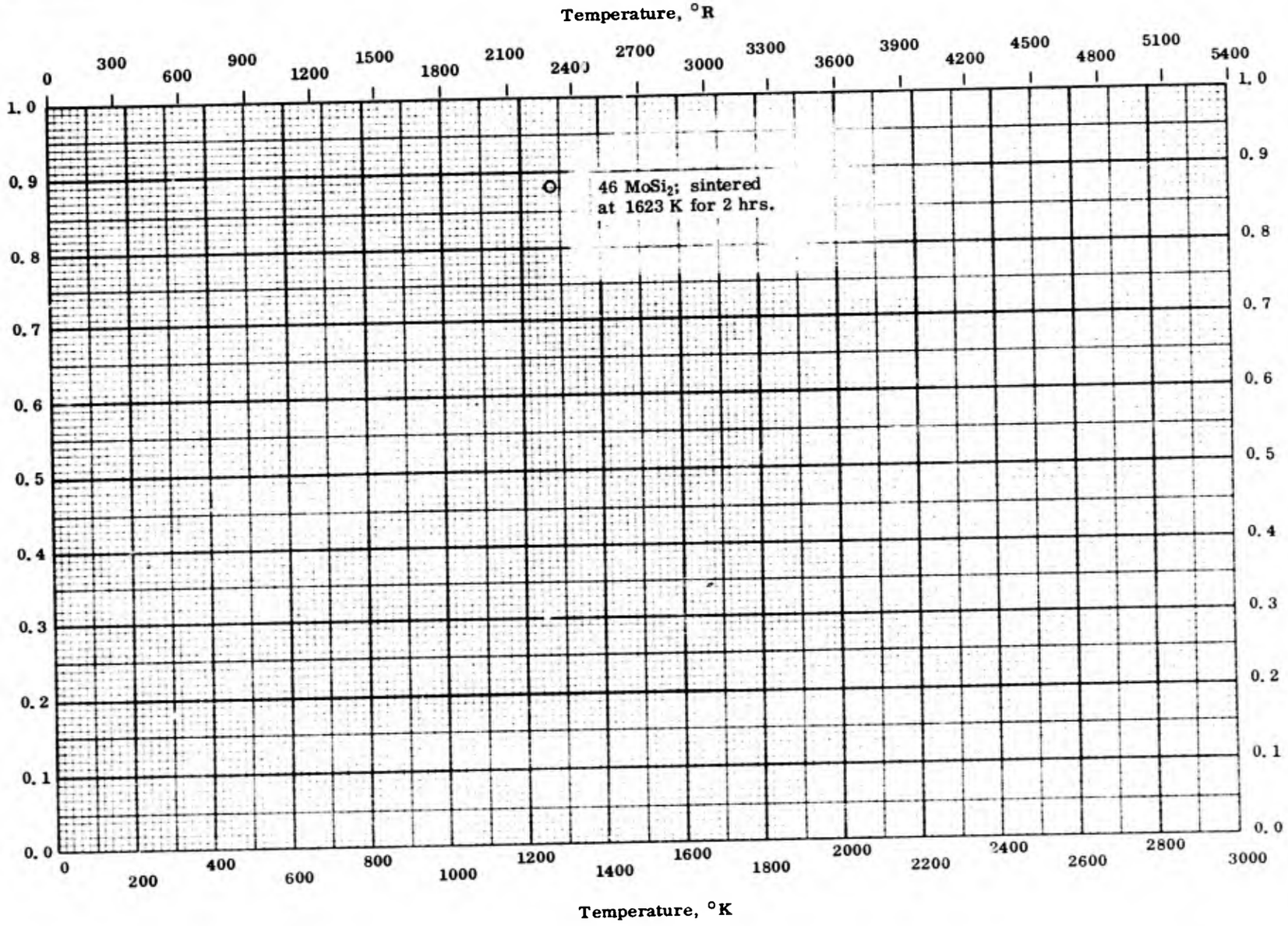
NORMAL SPECTRAL REFLECTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- NICKEL MONOXIDE + NICKEL ALUMINIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	72 NiO and 28 NiAl; 0.04 in. thickness plate; density 4.4 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.

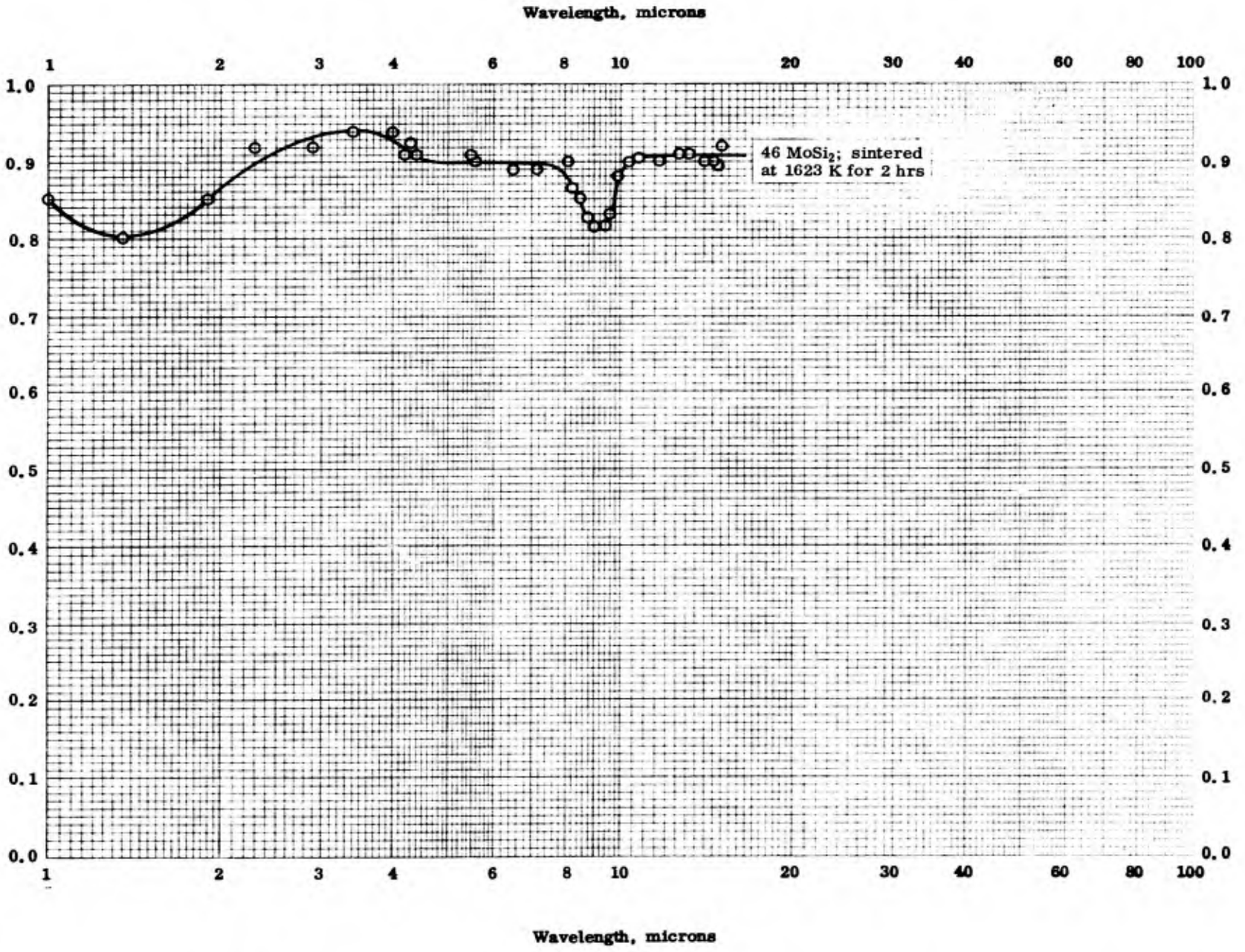


NORMAL TOTAL EMITTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

NORMAL TOTAL EMITTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	± 8	54 SiO_2 and 46 $MoSi_2$; 0.05 in. thickness plate; density 2.03 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.



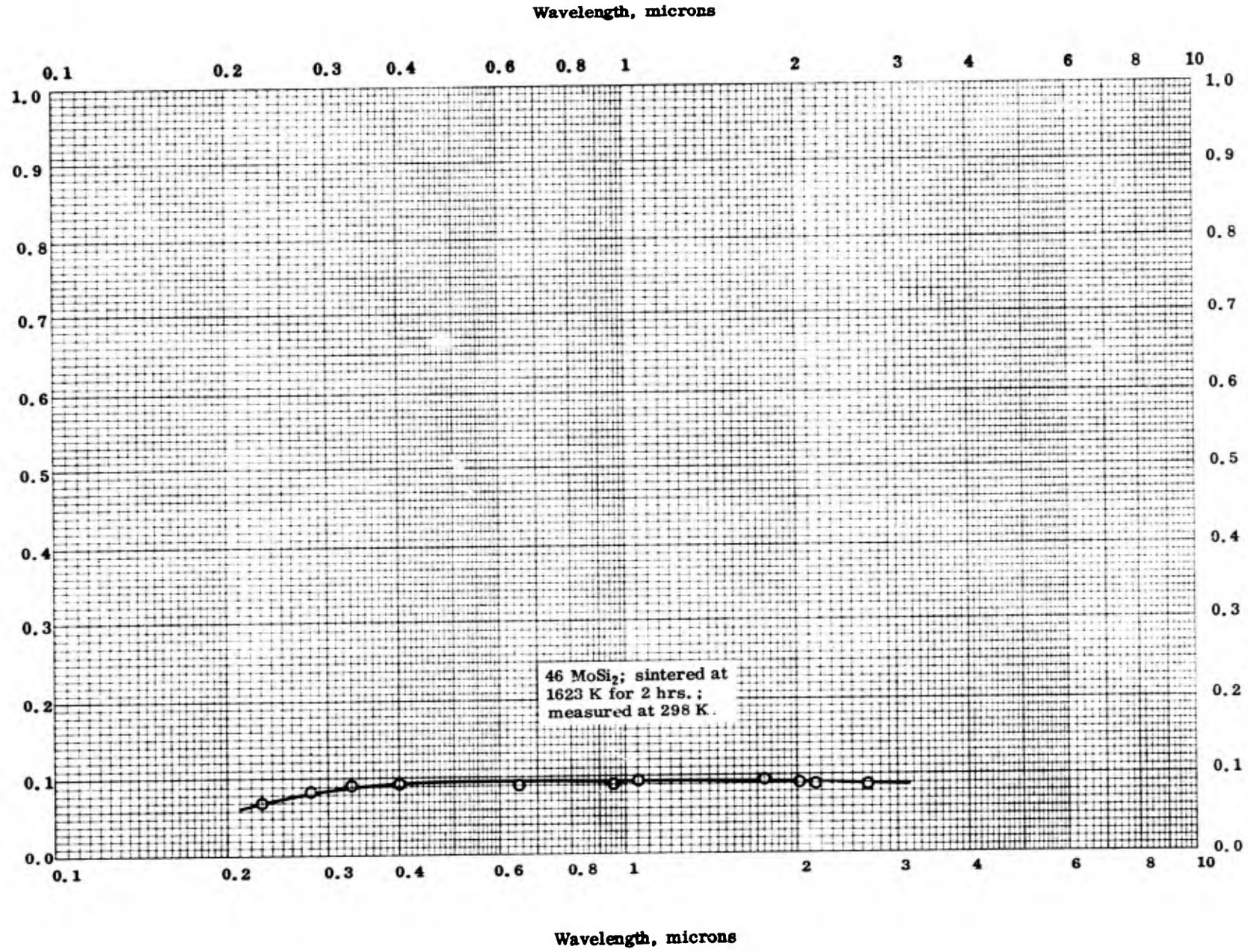
NORMAL SPECTRAL EMITTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	1-15		54 SiO_2 and 46 $MoSi_2$; 0.05 in. thickness plate; density 2.03 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon; data taken from a curve.



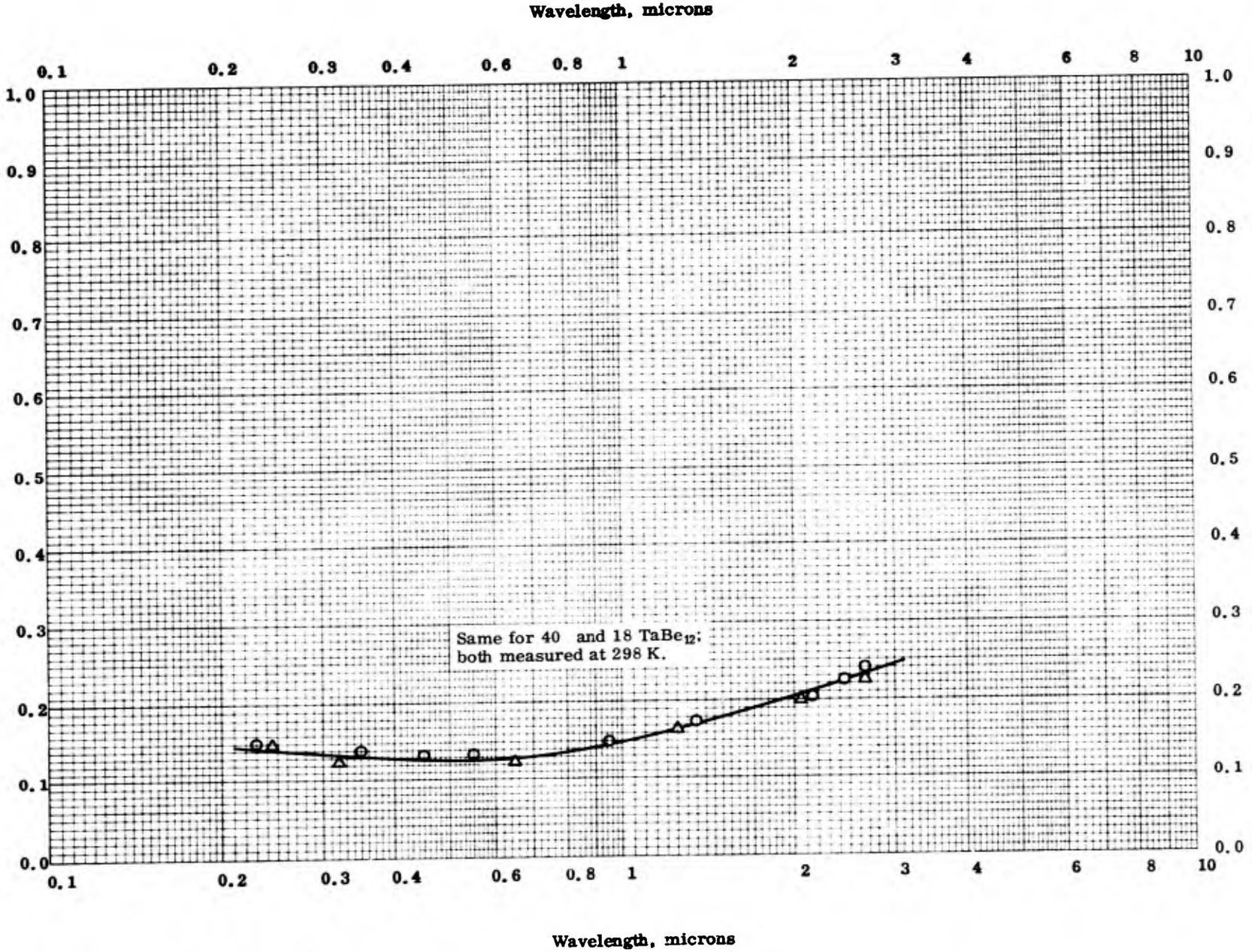
NORMAL SPECTRAL REFLECTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- SILICON DIOXIDE + MOLYBDENUM DISILICIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	54 SiO_2 and 46 $MoSi_2$; 0.05 in. thickness plate; density 2.03 g cm^{-3}.	Sintered at 1623 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.



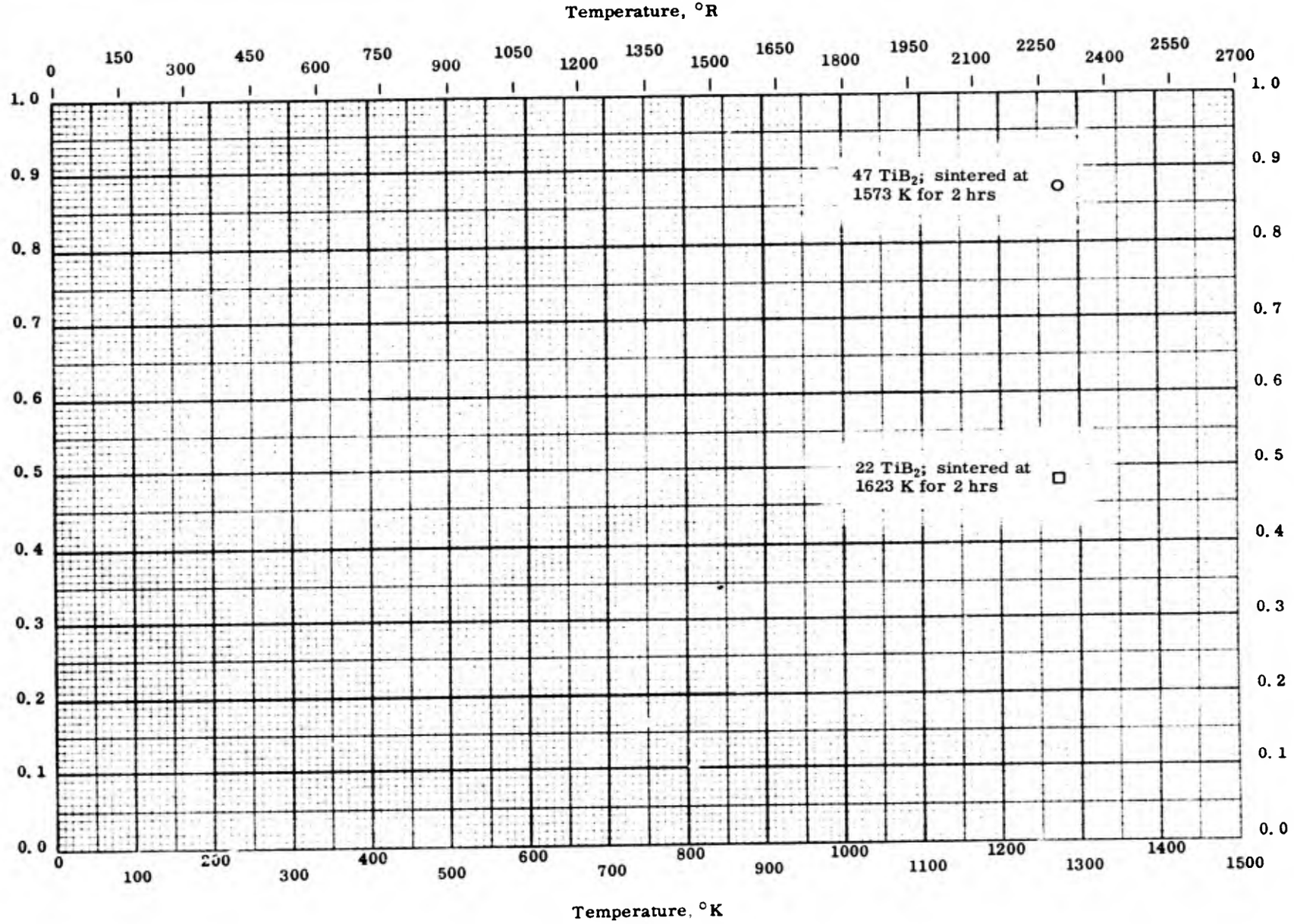
NORMAL SPECTRAL REFLECTANCE -- TANTALUM PENTOXIDE + TANTALUM BERYLLIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- TANTALUM PENTOXIDE + TANTALUM BERYLLIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	60 Ta_2O_5 and 40 $TaBe_{12}$; 0.09 in. thickness plate; density 1.81 g cm^{-3}.	Sintered at 1673 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
Δ	63-18	298	0.23-2.65	5	82 Ta_2O_5 and 18 $TaBe_{12}$; 0.055 in. thickness plate; density 5.19 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.

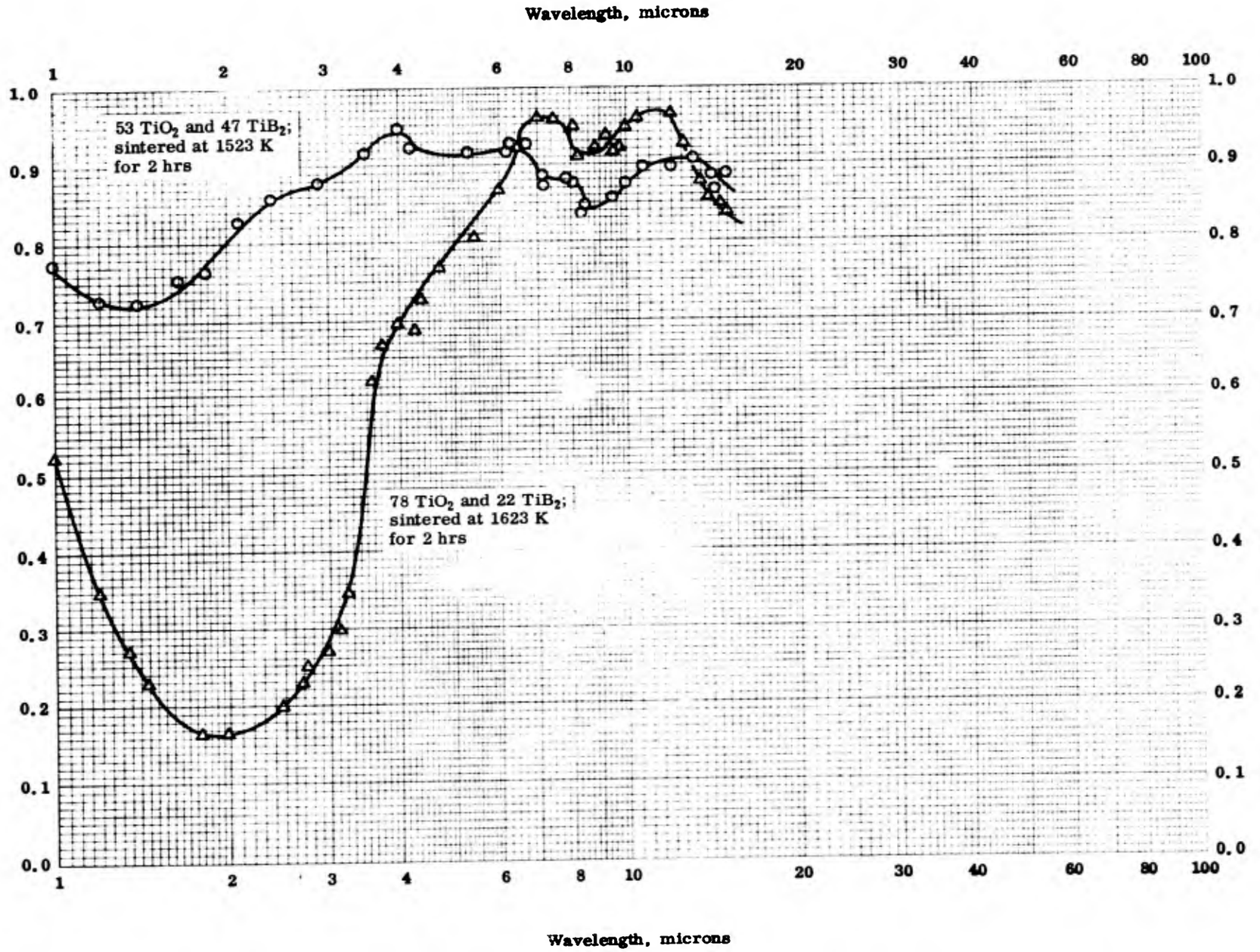


NORMAL TOTAL EMITTANCE -- TITANIUM DIOXIDE + TITANIUM DIBORIDE

NORMAL TOTAL EMITTANCE -- TITANIUM DIOXIDE + TITANIUM DIBORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	± 8	53 TiO_2 and 47 TiB_2; 0.05 in. thickness plate; density 2.78 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
□	63-18	1273	± 8	78 TiO_2 and 22 TiB_2; 0.042 in. thickness plate; density 2.47 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.

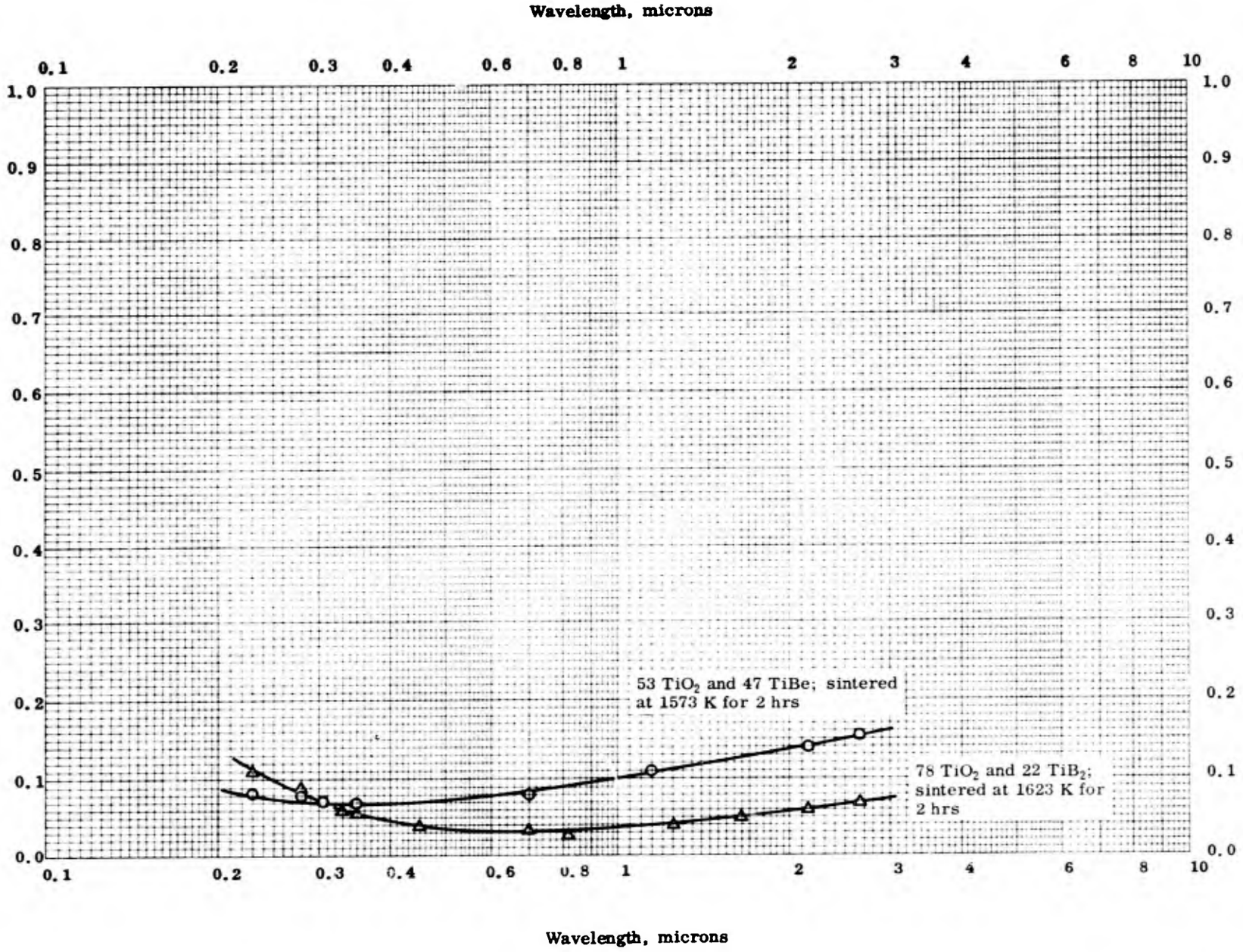


NORMAL SPECTRAL EMITTANCE -- TITANIUM DIOXIDE + TITANIUM DIBORIDE

NORMAL SPECTRAL EMITTANCE -- TITANIUM DIOXIDE + TITANIUM DIBORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	1-15		53 TiO_2 and 47 TiB_2; 0.05 in. thickness plate; density 2.78 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
Δ	63-18	1273	1-15		78 TiO_2 and 22 TiB_2; 0.042 in. thickness plate; density 2.47 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.

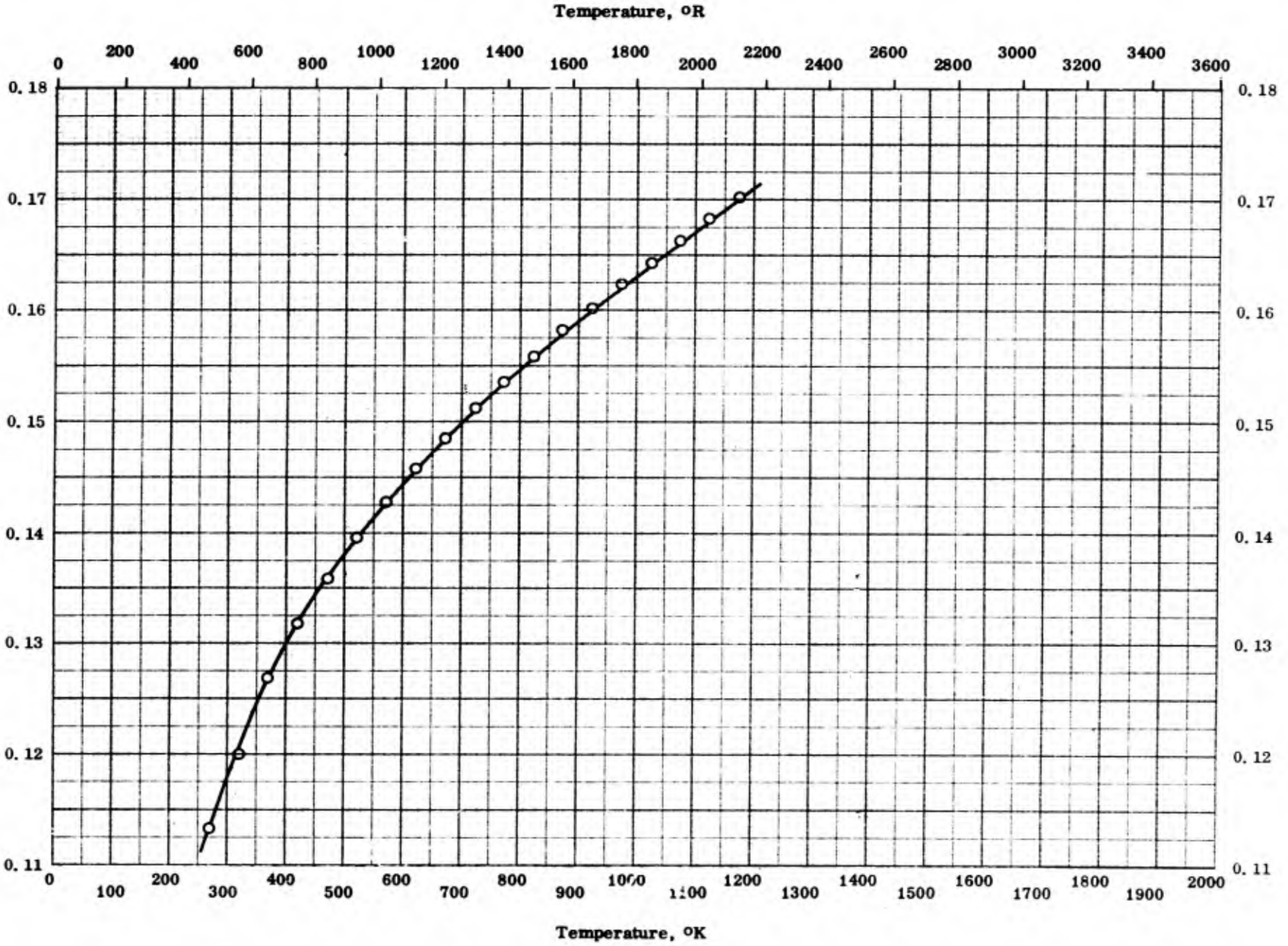


NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIOXIDE +TITANIUM DIBORIDE

NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIOXIDE + TITANIUM DIBORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	53 TiO_2 and 47 TiB_2; 0.05 in. thickness plate, density 2.78 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
Δ	63-18	298	0.23-2.65	5	78 TiO_2 and 22 TiB_2; 0.042 in. thickness plate; density 2.47 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.

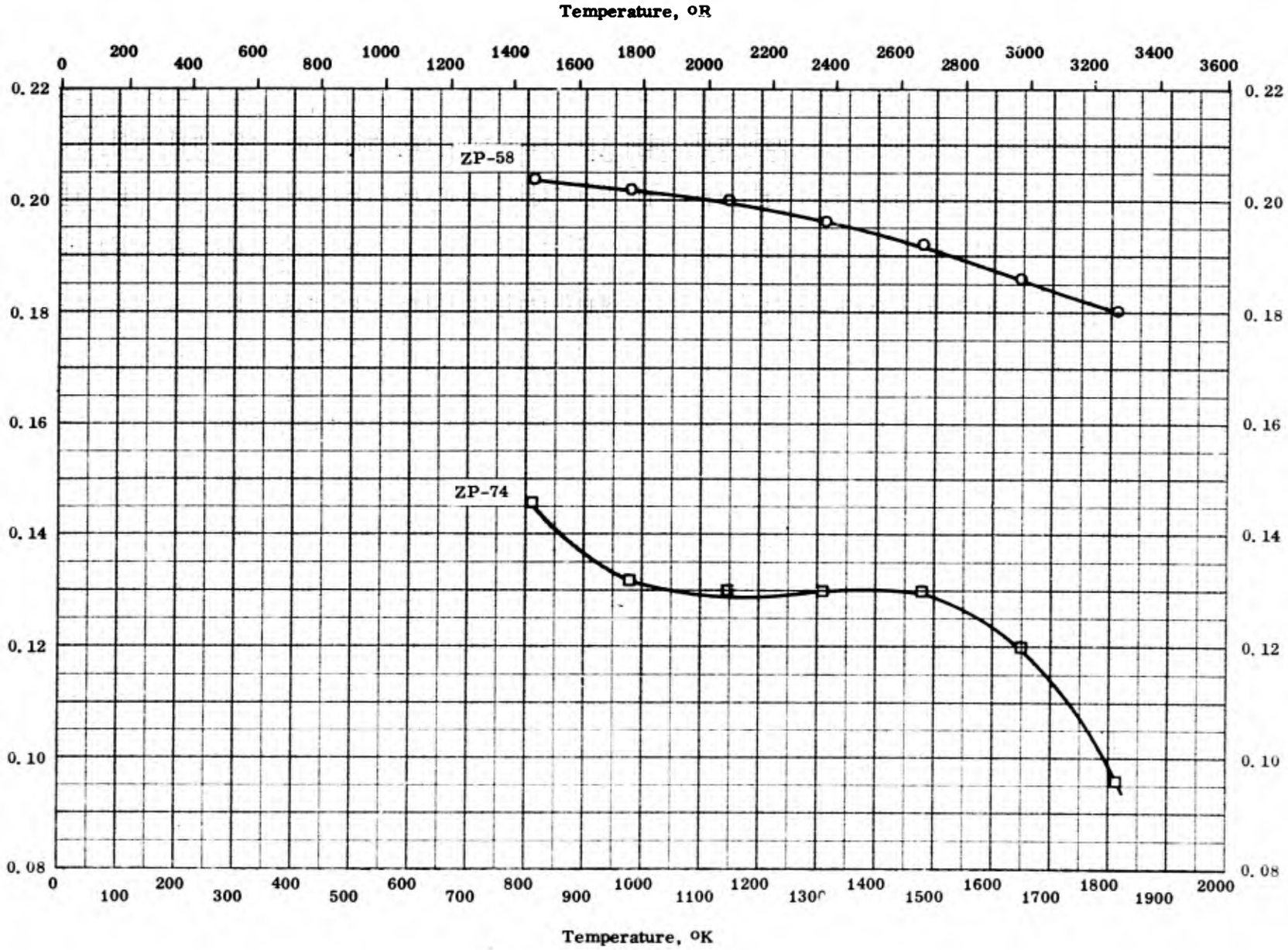


SPECIFIC HEAT -- ZIRCONIUM DIOXIDE + HAFNIUM + MAGNESIUM

SPECIFIC HEAT -- ZIRCONIUM DIOXIDE + HAFNIUM + MAGNESIUM

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-10	273-1173		1 - 10 Mg, 1 - 10 Hf, 0.1 - 1 Al, 0.1 - 1 Ca, 0.1 - 1 Na, 0.1 - 1 Si, 0.10 Ti, 0.01 - 0.1 Fe, 0.01 > Mn, 0.001 > Cu; density 337 lb ft^{-3}.	Fired to 1600 C for 24 hrs.

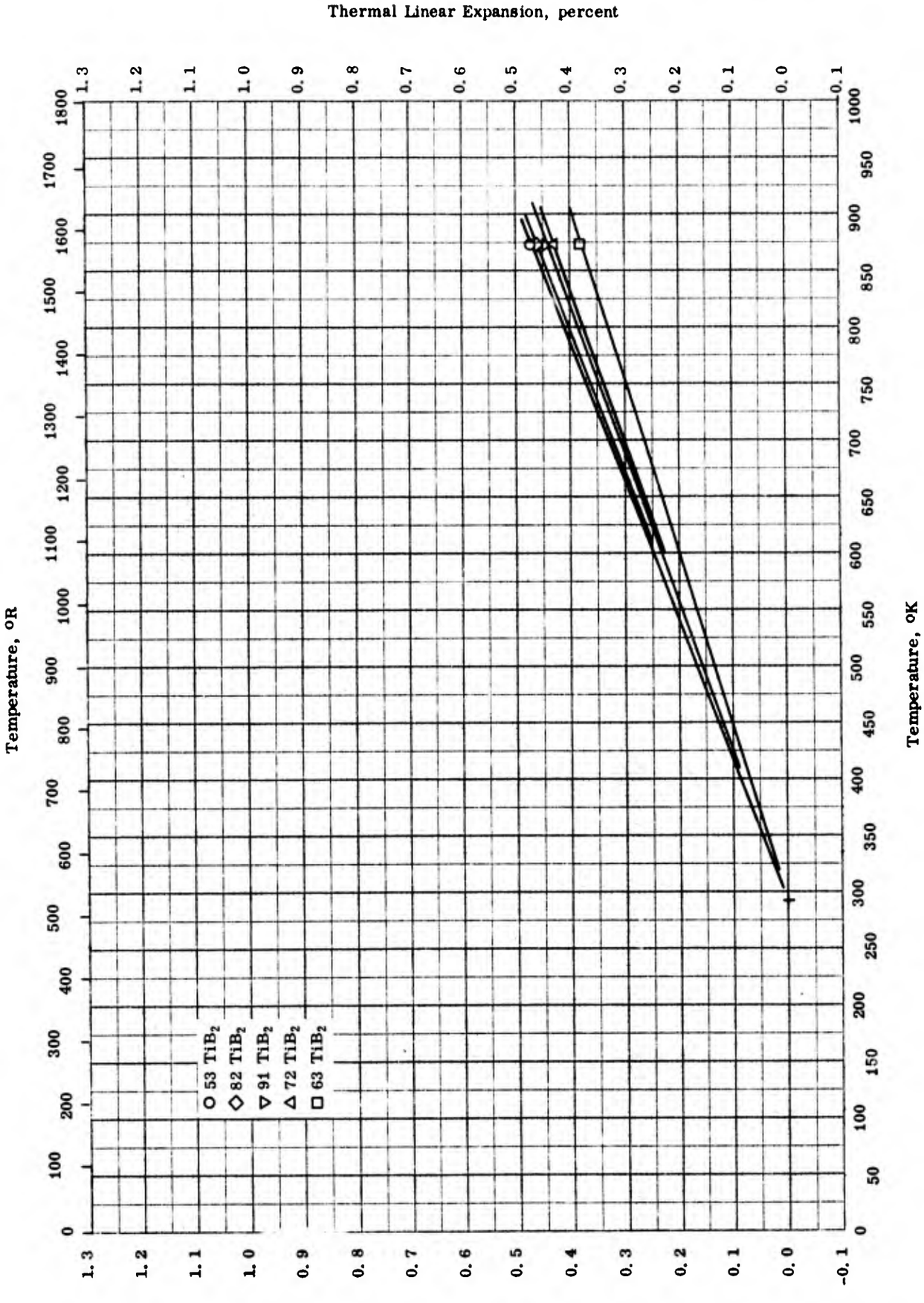


SPECIFIC HEAT -- ZIRCONIUM DIOXIDE + ΣX_i

SPECIFIC HEAT -- ZIRCONIUM DIOXIDE + ΣX_i

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-17	810-1810		ZP 58; 80 ZrO_2 - 30 Fines, 20 ZrO_2 - 325 Fines, 12.0 $NH_4H_2PO_4$, and 6.0 H_2O; bulk density 215 lb ft^{-3}; porosity 34.90.	
□	60-17	810-1810		ZP 74; 80.0 ZrO_2 - 30 Fines, 5.0 ZrO_2 - 325 Fines, 15.0 Cr_2O_3, 9.0 $NH_4H_2PO_4$ and 5.0 H_2PO_3F; bulk density 217.0 lb ft^{-3}, apparent porosity 21.96.	

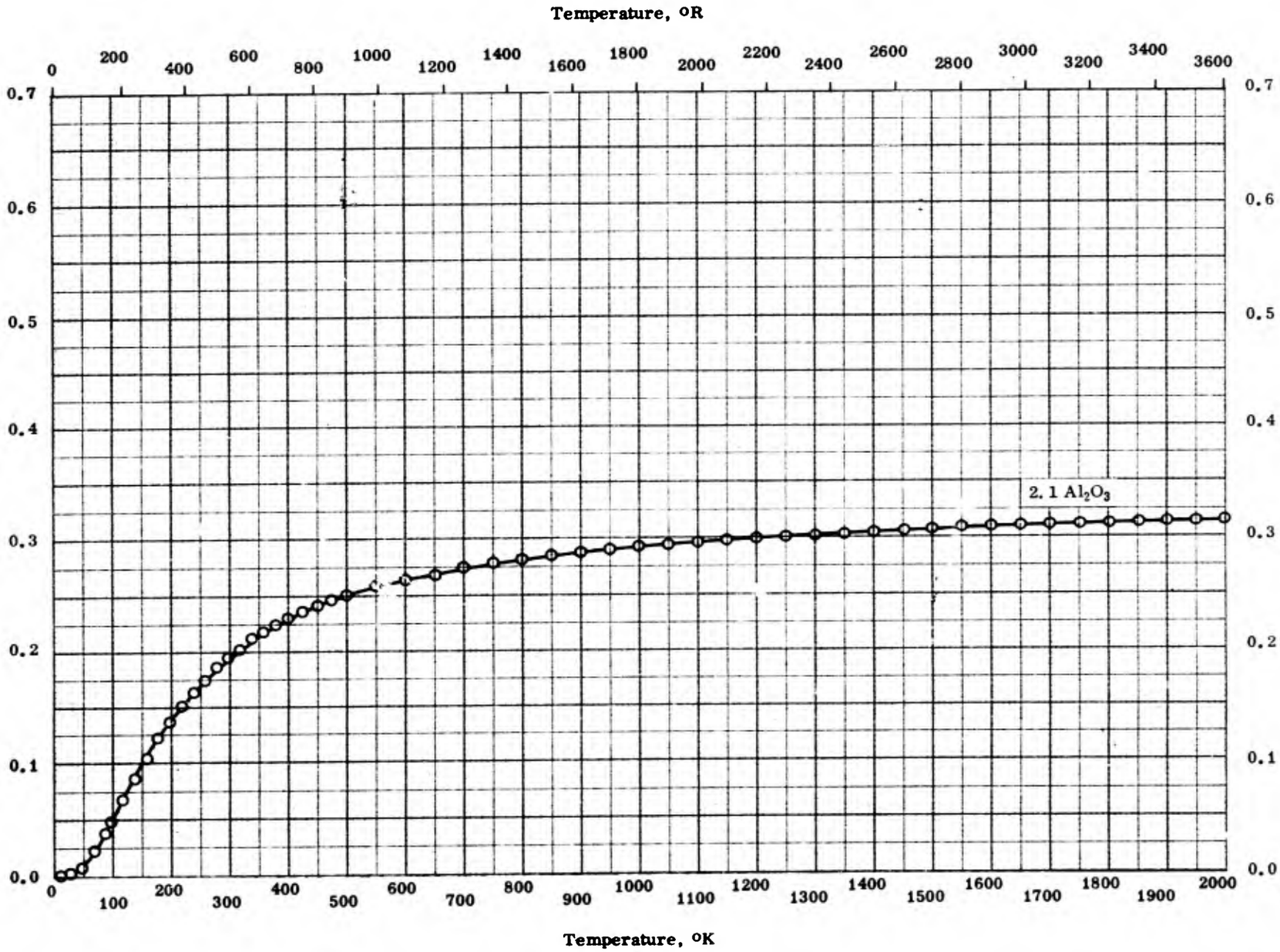


THERMAL LINEAR EXPANSION -- TITANIUM DIBORIDE + TITANIUM NITRIDE

THERMAL LINEAR EXPANSION -- TITANIUM DIBORIDE + TITANIUM NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-10	293-873		52.9 TiB_2 and 47.1 TiN; porosity 1-2%.	TiB_2 prepared by vacuum-thermal method, and TiN by nitriding Ti in a charge of T_2O_2 + 2C; powdered TiB_2 and TiN pressed at high temperatures and then sintered.
□	55-10	293-873		62.8 TiB_2 and 37.2 TiN; porosity 1-2%.	Same as above.
△	55-10	293-873		72.4 TiB_2 and 27.6 TiN; porosity 1-2%.	Same as above.
◇	55-10	293-873		81.8 TiB_2 and 18.2 TiN; porosity 1-2%.	Same as above.
▽	55-10	293-873		91.0 TiB_2 and 9 TiN; porosity 1-2%.	Same as above.

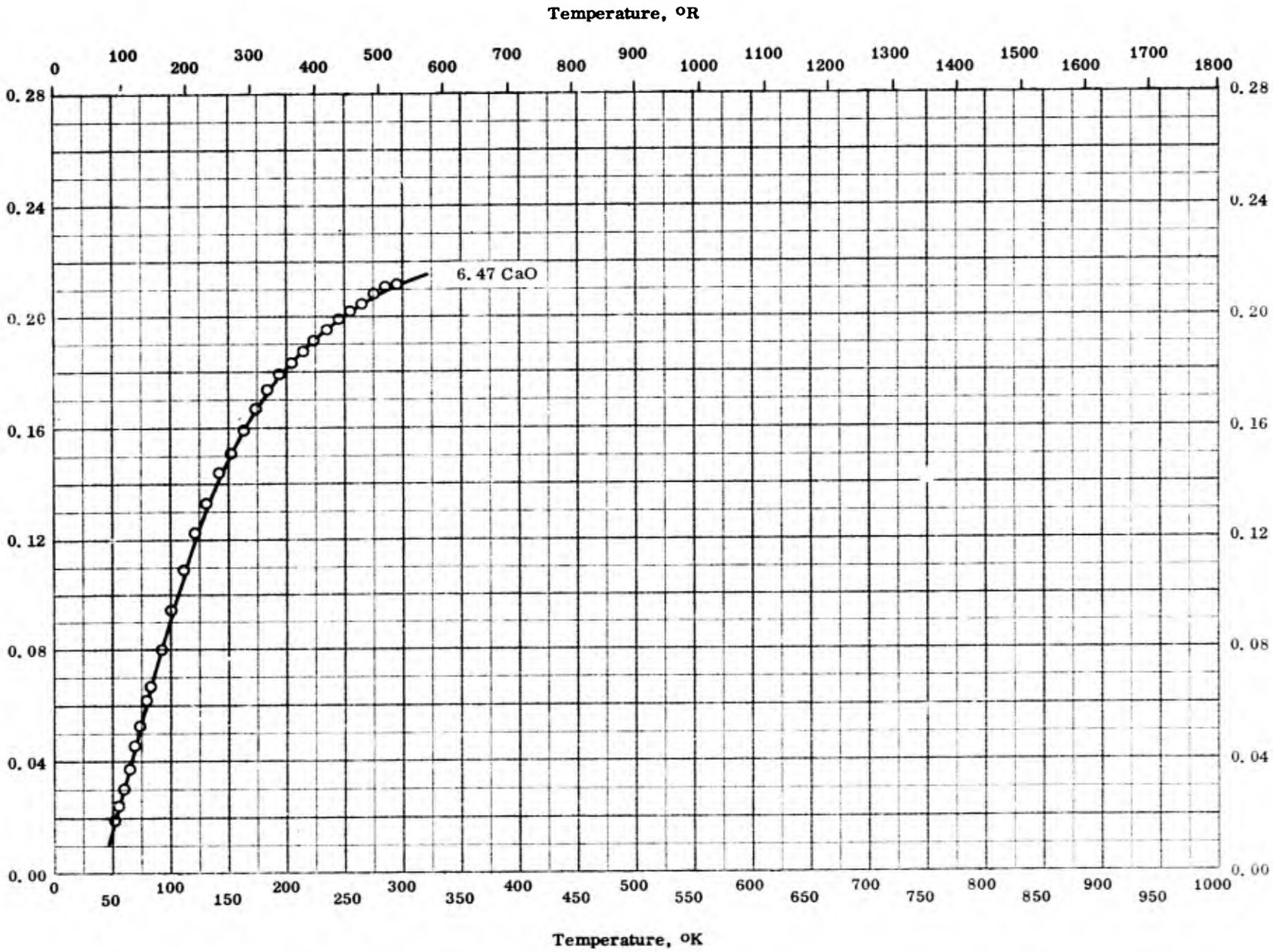


SPECIFIC HEAT -- ALUMINUM CARBIDE + ALUMINUM OXIDE

SPECIFIC HEAT -- ALUMINUM CARBIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-6	18-2000		94.8 Al_4C_3, 2.1 Al_2O_3, 1.3 AlN, 1.2 free Al, 0.8 free C, 0.10-1.0 Fe, 0.01-0.1 Si, 0.01-0.1 V, 0.001-0.01 Cr, 0.001-0.01 Cu, 0.001-0.01 Mg, 0.001-0.01 N, 0.001-0.01 Ti, 0.001-0.01 Zr, 0.0001-0.001 Ca, and 0.0001-0.001 Mn.	Under argon atmosphere.

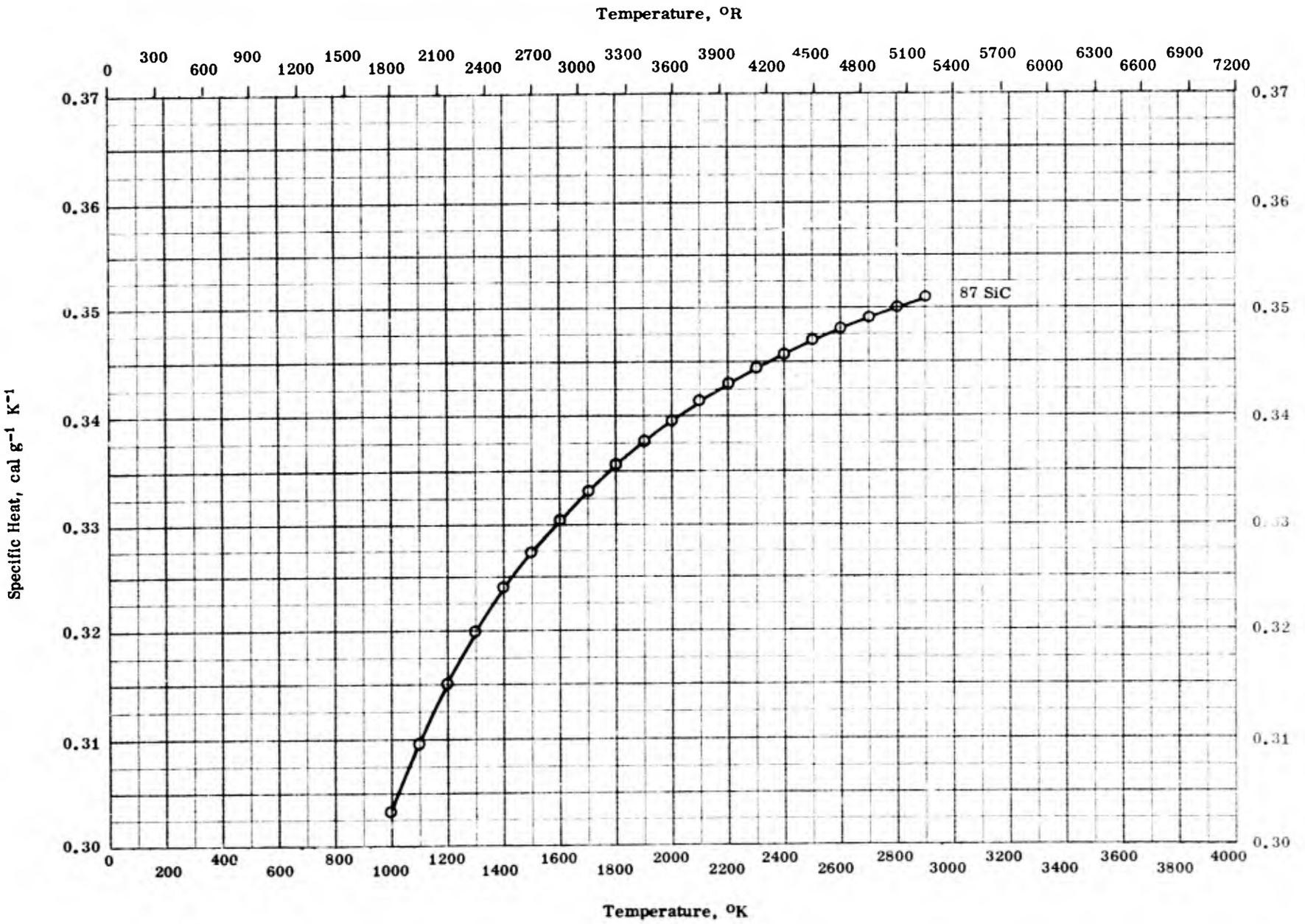


SPECIFIC HEAT -- CALCIUM CARBIDE + CALCIUM OXIDE

SPECIFIC HEAT -- CALCIUM CARBIDE + CALCIUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	41-1	53-295	0.3	91.0 CaC_2, 6.47 CaO, 1.15 SiO_2, 0.77 Al_2O_3, 0.29 FeS, 0.2 C, and 0.08 MgO.	Corrected for impurities.

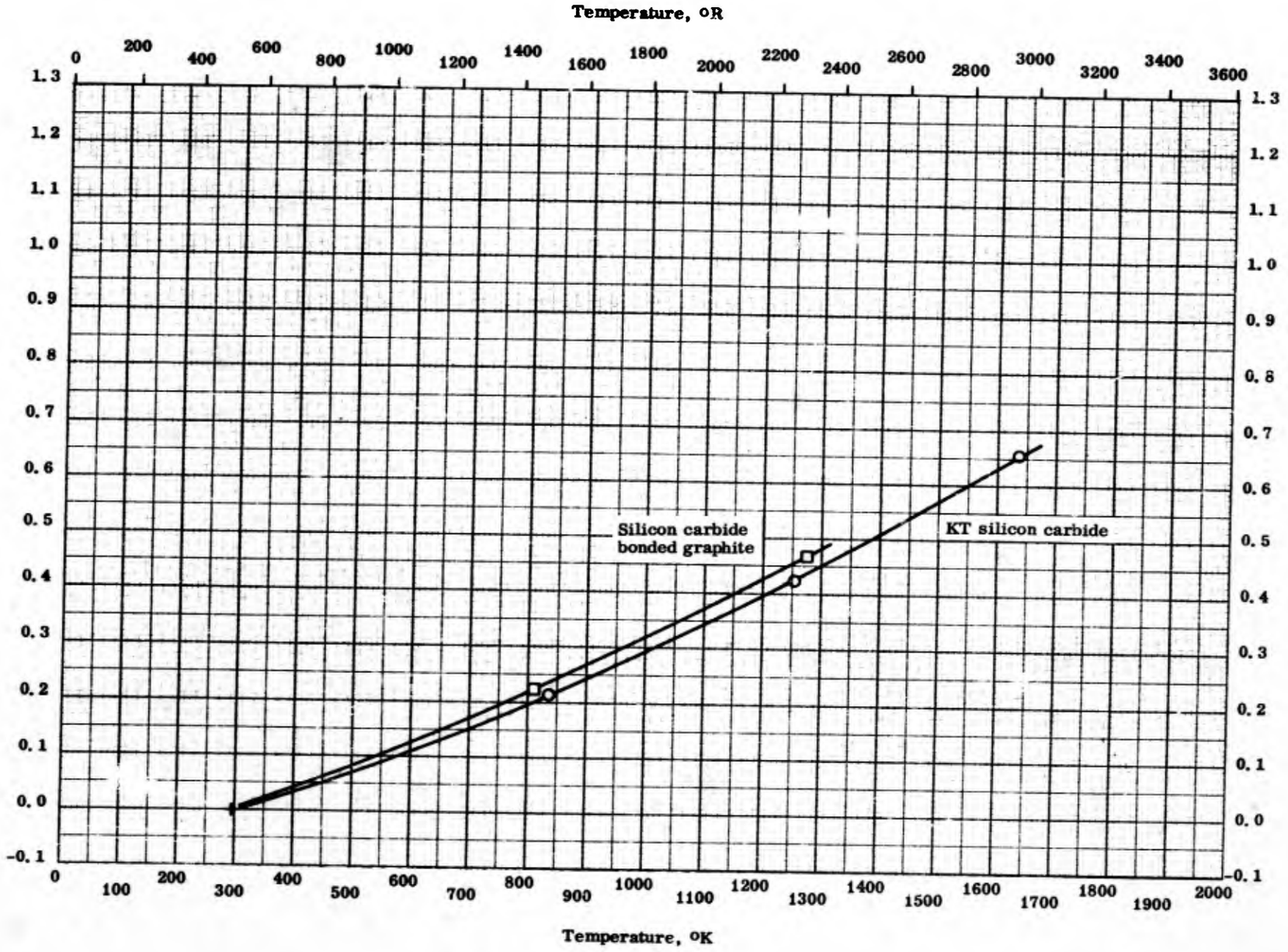


SPECIFIC HEAT -- SILICON CARBIDE + CARBON

SPECIFIC HEAT -- SILICON CARBIDE + CARBON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	64-8	1000-3413	2	87.07 Si C, 12.0 free C, and 0.73 Fe.	Under argon atmosphere.

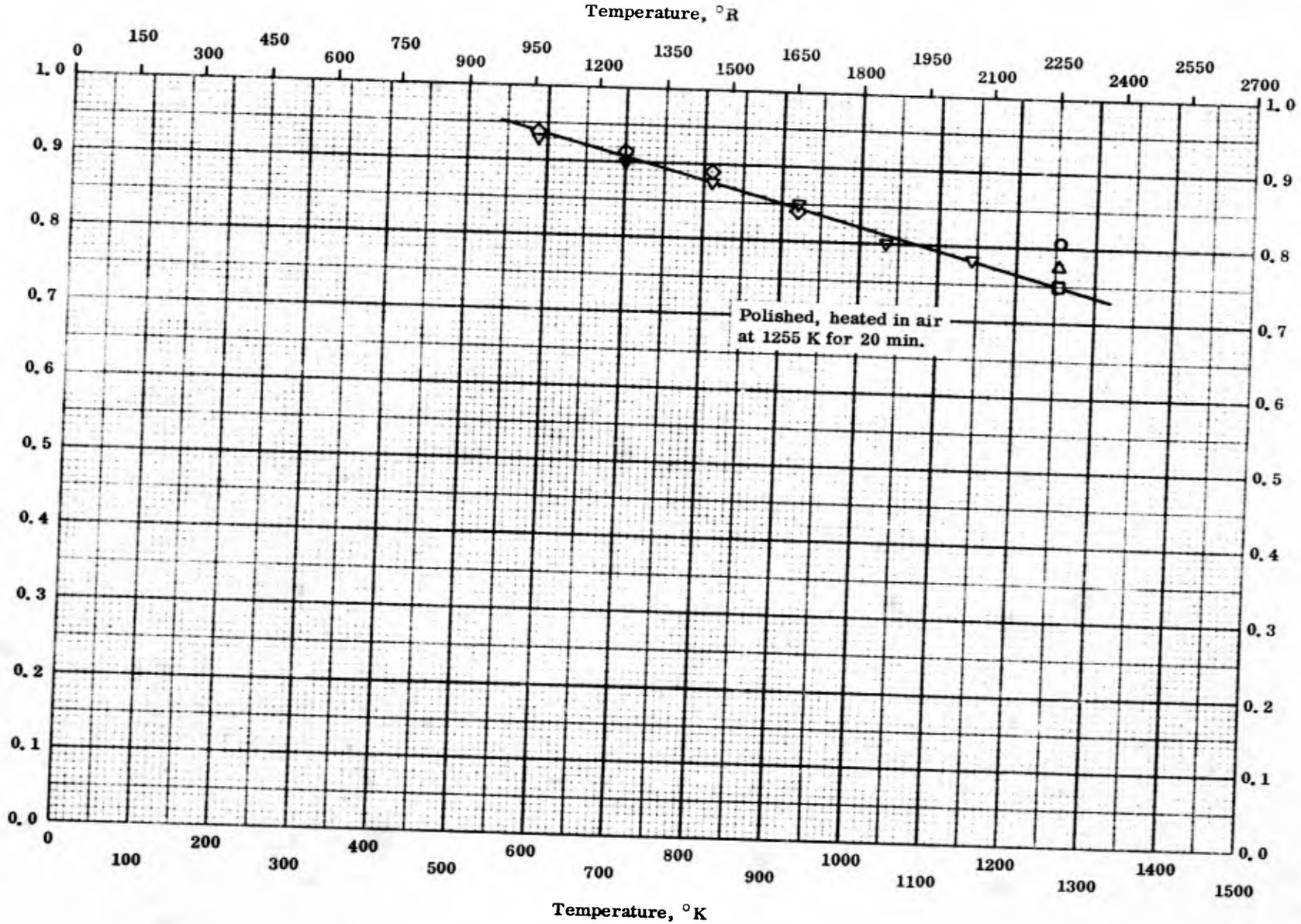


THERMAL LINEAR EXPANSION -- SILICON CARBIDE + CARBON

THERMAL LINEAR EXPANSION -- SILICON CARBIDE + CARBON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	60-11	300-1636	< 5	KT silicon carbide; 92 - 98 SiC, 2 - 8 free Si, 0 - 5 free C; specimen 3/8 in. diameter by 3 in. long. [Author's design.: E1]	Dry pressed and cured.
□	60-11	300-1278	< 5	Silicon carbide bonded graphite; 20 - 25 free C; specimen 3/8 in. diameter by 3 in. long.	

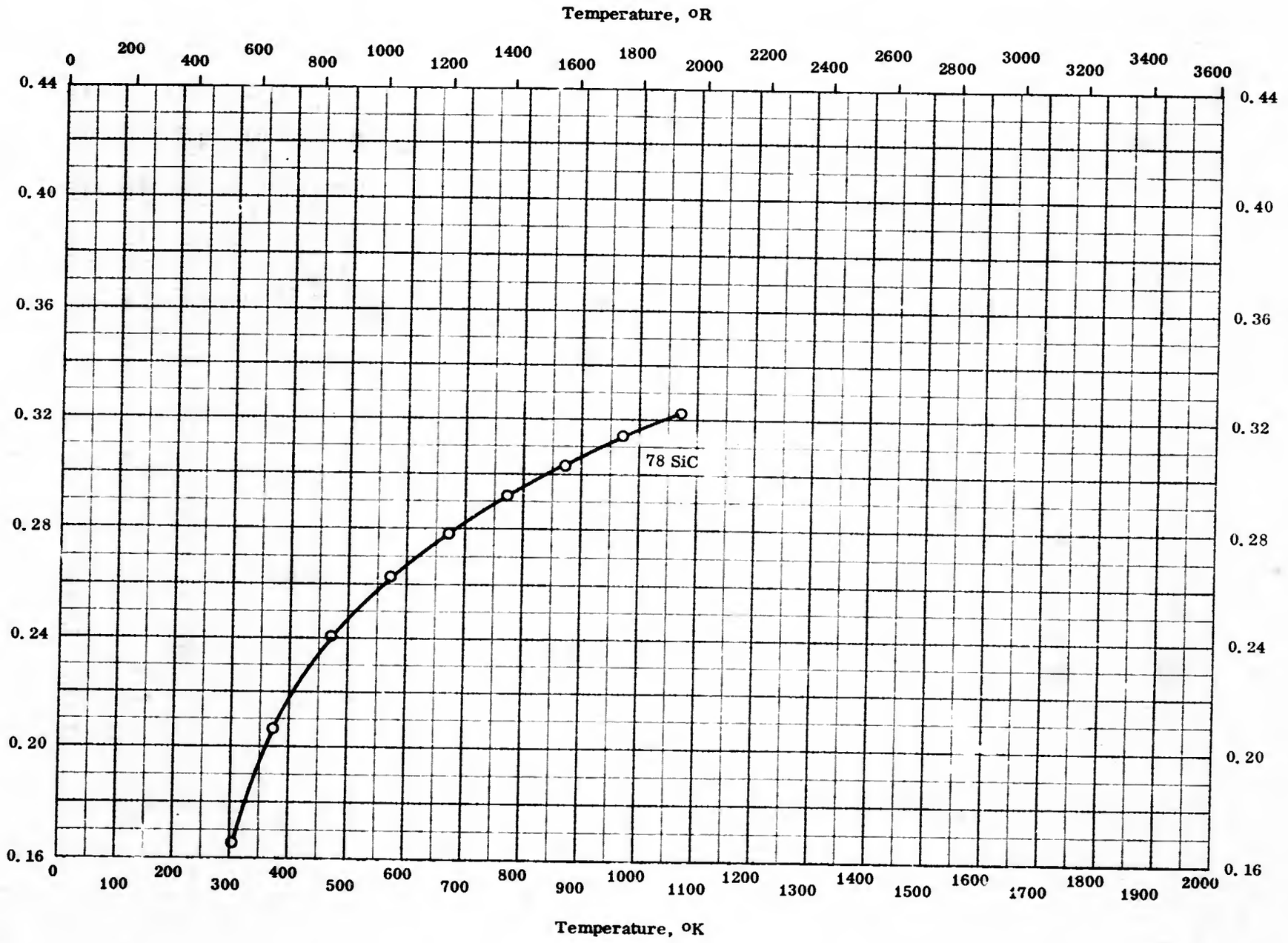


NORMAL TOTAL EMITTANCE -- SILICON CARBIDE + CARBON

NORMAL TOTAL EMITTANCE -- SILICON CARBIDE + CARBON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-25	1255		SiC + C (830 series), National Crucible.	Ground and polished; cleansing with alcohol and distilled water.
△	62-25	1255		Same as above.	Same as above except heated in air at 1255 K for 10 min.
□	62-25	1255		Same as above.	Same as above except heated in air at 1255 K for 18 min.
▽	62-25	589-1255		Same as above.	The above specimen after heated in air at 1255 K for 20 min.
◇	62-25	589-1255		Same as above.	Same as above; second sample.



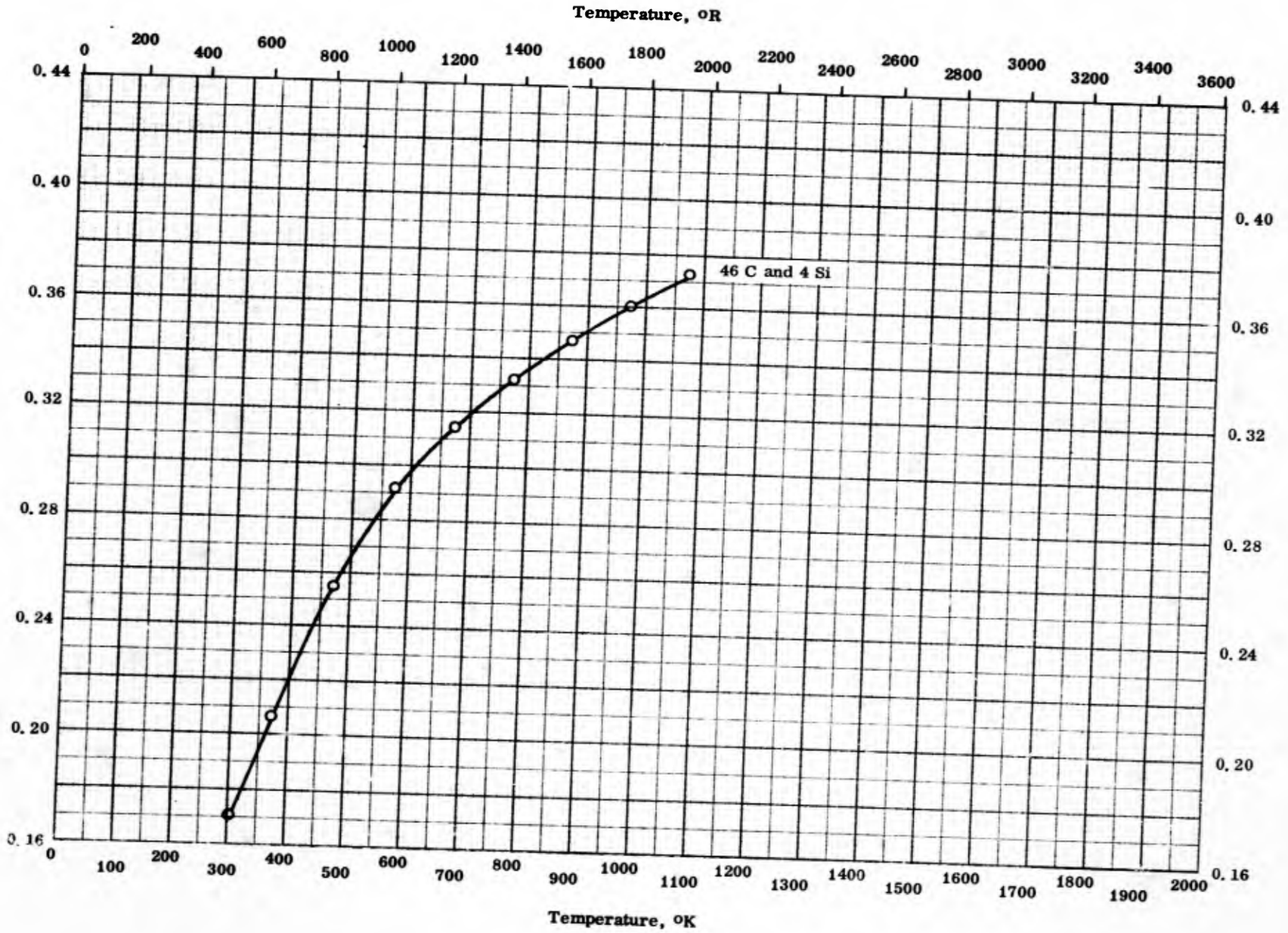
TPRC

SPECIFIC HEAT -- SILICON CARBIDE + GRAPHITE

SPECIFIC HEAT -- SILICON CARBIDE + GRAPHITE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-21	303-1073	<3	78.0 SiC, 20 C, 1 Si, and 1.0 various metals. [Author's design.: 80 SiC - 20 C (low free carbon)]	

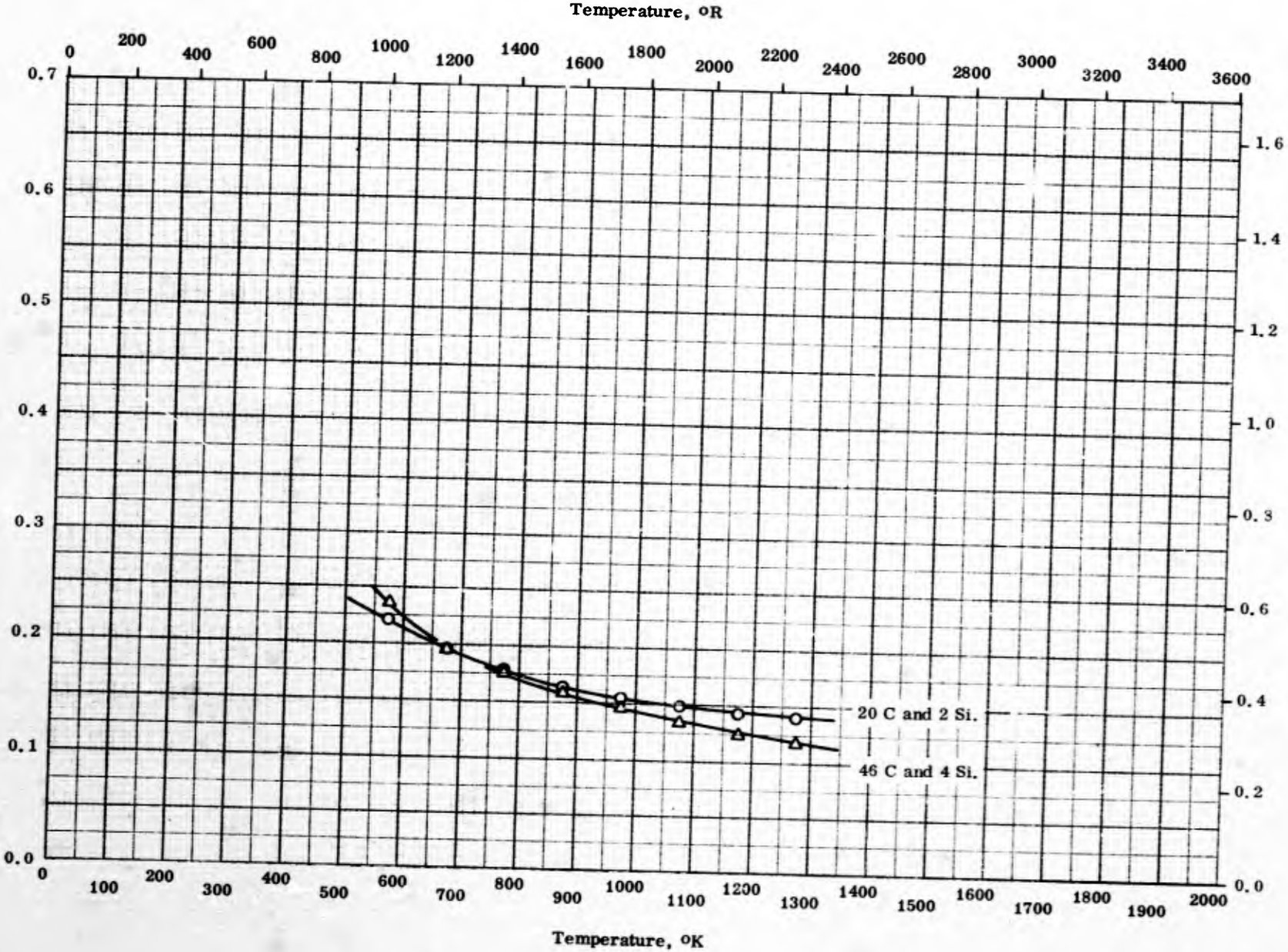


SPECIFIC HEAT -- SILICON CARBIDE + GRAPHITE + SILICON

SPECIFIC HEAT -- SILICON CARBIDE + GRAPHITE + SILICON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-21	303-1073	<3	50 SiC, 46 C and 4 Si. [Author's design.: 50 SiC - 50 C (high free carbon)].	

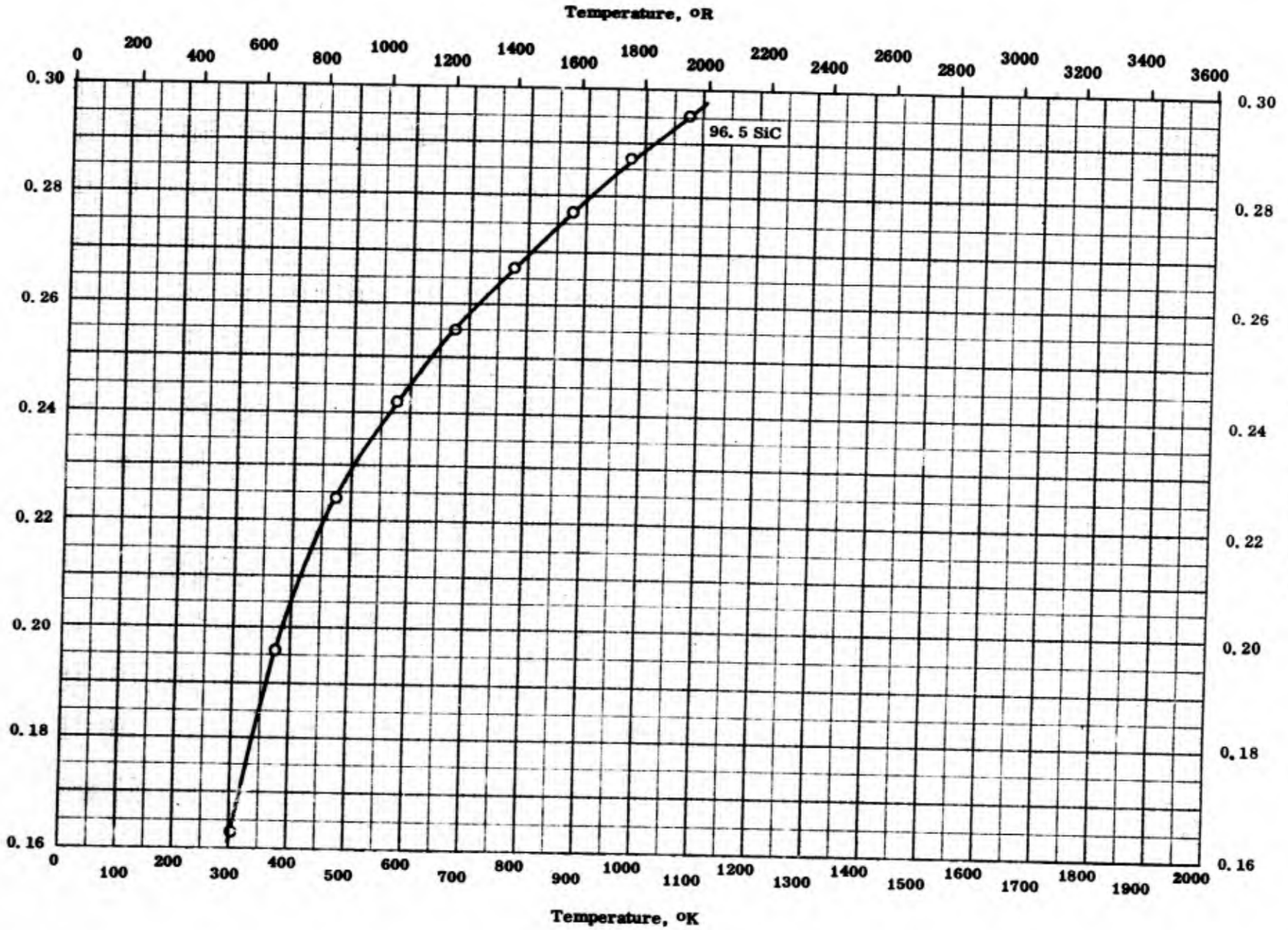


THERMAL CONDUCTIVITY -- SILICON CARBIDE + GRAPHITE + SILICON

THERMAL CONDUCTIVITY -- SILICON CARBIDE + GRAPHITE + SILICON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-4	573-1273	±4-±6	78 SiC, 20 C, and 2 Si; 2.722 g cm^{-3} density (92% of theoretical).	Measured parallel to pressing direction.
Δ	62-4	573-1273	±4 ±6	50 SiC, 46 C, and 4 Si; 1.974 g cm^{-3} density (74% of theoretical).	Same as above.

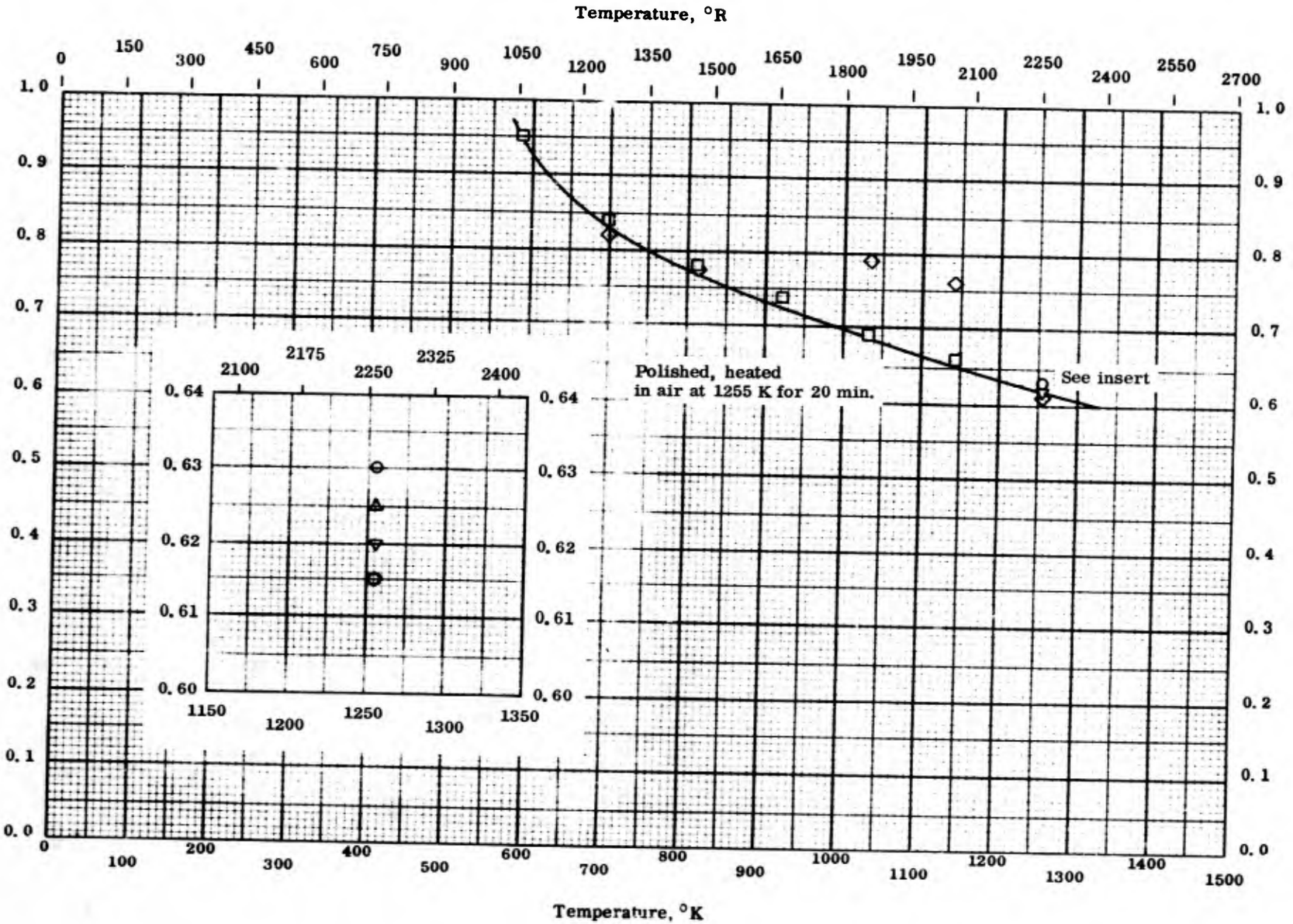


SPECIFIC HEAT -- SILICON CARBIDE + SILICON

SPECIFIC HEAT -- SILICON CARBIDE+ SILICON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
o	62-21	303-1073	<3.0	96.5 Si C, 2.5 Si, 0.4 C, 0.4 Al.	

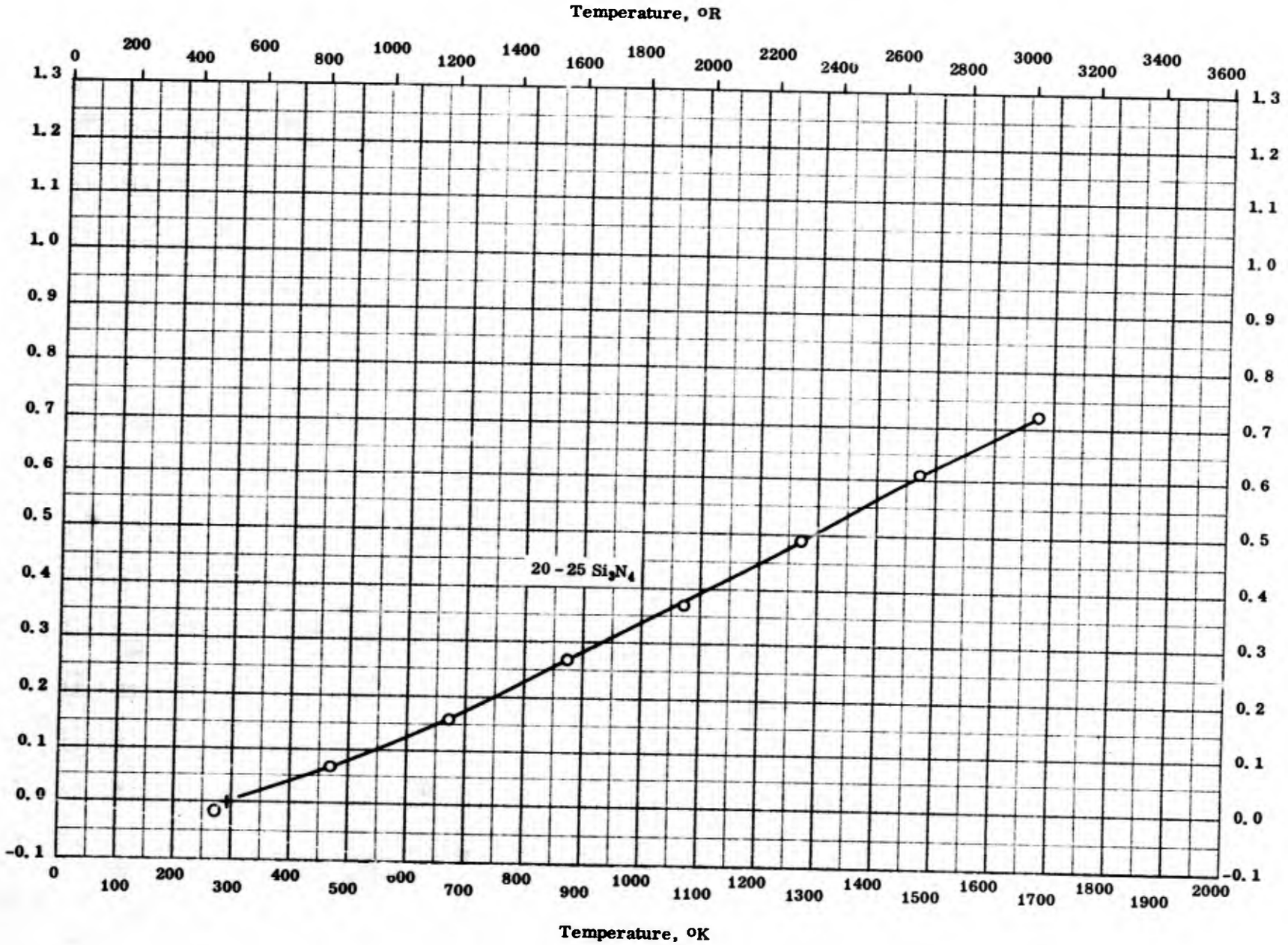


NORMAL TOTAL EMITTANCE -- SILICON CARBIDE + SILICON

NORMAL TOTAL EMITTANCE -- SILICON CARBIDE +SILICON

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-25	1255		"Durchy", a mixture of SiC and Si from carborundum.	Ground and polished, cleansing with alcohol and distilled water.
△	62-25	1255		Same as above.	Same as above except heated in air at 1255 K for 10 min.
▽	62-25	1255		Same as above.	Same as above except heated in air at 1255 K for 20 min.
□	62-25	589-1255		Same as above.	The above specimen after heated in air at 1255 K for 20 min.
◇	62-25	589-1255		Same as above.	Same as above; another sample.

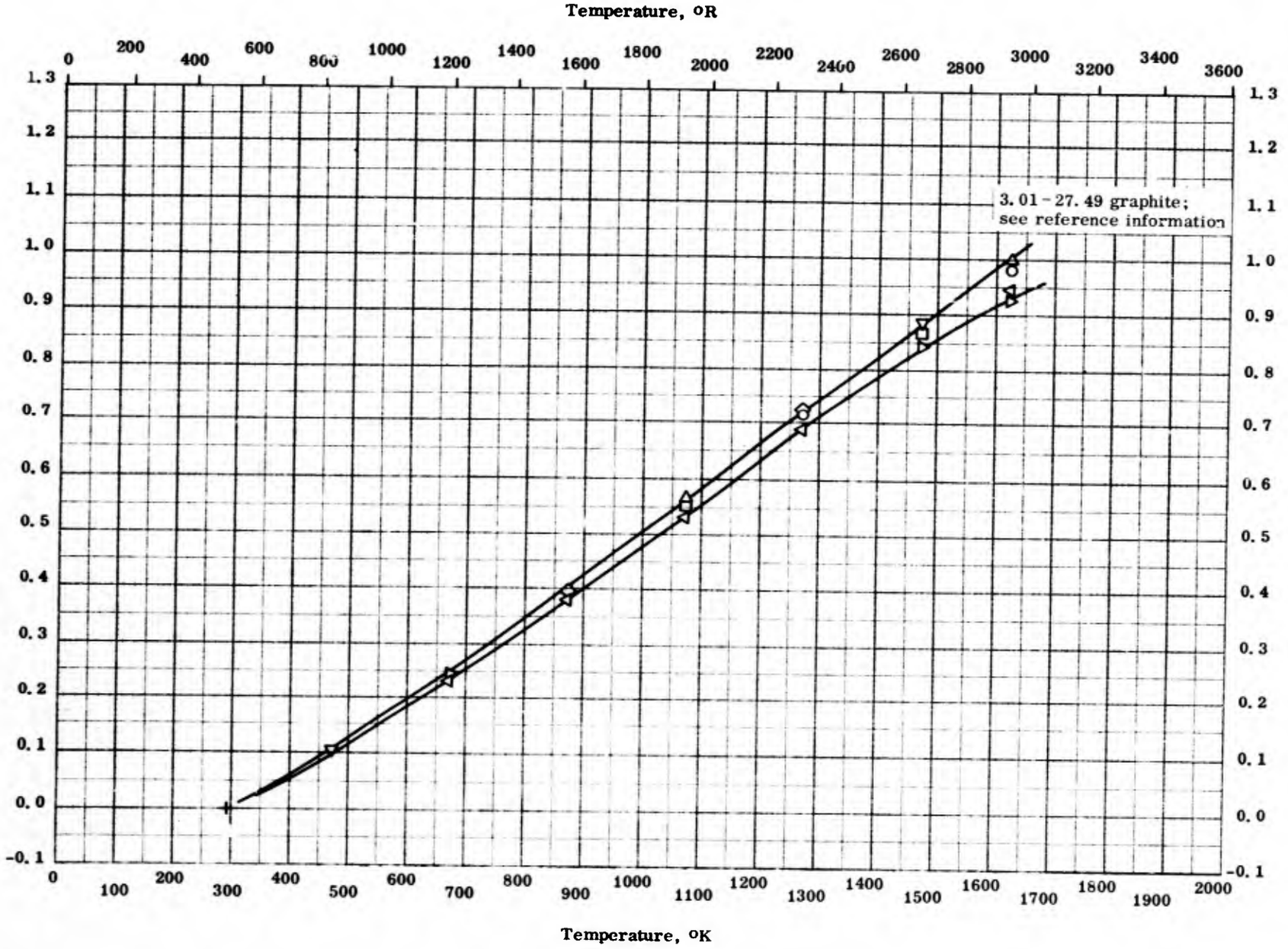


THERMAL LINEAR EXPANSION -- SILICON CARBIDE + SILICON NITRIDE

THERMAL LINEAR EXPANSION -- SILICON CARBIDE + SILICON NITRIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-22	273-1673		20 - 25 $Si_3 N_4$ and remainder SiC; nominal density 3.2 g cm^{-3}; dense polycrystalline sample.	



THERMAL LINEAR EXPANSION -- ZIRCONIUM CARB. + GRAPHITE

THERMAL LINEAR EXPANSION — ZIRCONIUM CARBIDE + GRAPHITE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	62-37	298-1623		96.99 ZrC and 3.01 graphite; porosity 2.2%; bulk density 6.09 g cm^{-3}; ZrC from New Products Branch, The Carborundum Co. in form of -325 mesh powder; spectrographic analysis: 0.1-0.5 Fe, 0.01-0.05 Cr, Ca, and 0.005-0.01 B, Si, Ti; density of ZrC calculated from crystal structure data 6.70 g cm^{-3}; graphite of regular mold stock from International Graphite and Electrode Co. with particle size 70-100 mesh and bulk density of 1.77 g cm^{-3}; calculated density of graphite 1.915 g cm^{-3}. [Author's design: composite 10 A]	Corresponds to 88.0 vol% ZrC and 9.8 vol % graphite; ZrC and graphite mixed in rotary mill, hot pressed at 2250 C and 2000 psi into 4 1/2 in. dia by 4 in. long bodies, cut to size, and ground; measured perpendicular to hot pressing direction.
□	62-37	298-1623		94.76 ZrC and 5.24; porosity 9.6%; bulk density 5.29 g cm^{-3}; same as above. [Author's design: composite 20 A]	Corresponds to 73.6 vol% ZrC and 16.0 vol% graphite; same as above; due to lack of definition between phases, volume analysis unreliable.
◇	62-37	298-1623		92.18 ZrC and 7.82 graphite; porosity 16.3%; bulk density 4.55 g cm^{-3}; same as above. [Author's design: composite 30 A]	Corresponds to 61.5 vol% ZrC and 22.2 vol% graphite; same as above; volume analysis reliable.
△	62-37	298-1623		82.99 ZrC and 17.01 graphite; porosity 7.9%; bulk density 4.23 g cm^{-3}; same as above. [Author's design: composite 40 A]	Corresponds to 51.3 vol% ZrC and 40.8 vol% graphite; same as above except measured parallel to hot pressing direction.
▽	62-37	298-1623		Same as above.	Same as above except measured perpendicular to hot pressing direction.
▷	62-37	298-1623		72.51 ZrC and 27.49 graphite; approx 0.0% porosity; bulk density 3.97 g cm^{-3}; same as above. [Author's design: composite 60 A]	Corresponds to 43.0 vol% ZrC and 57.0 vol% graphite; same as above except measured parallel to hot pressing direction.

(Continued onto next page)

REFERENCE INFORMATION

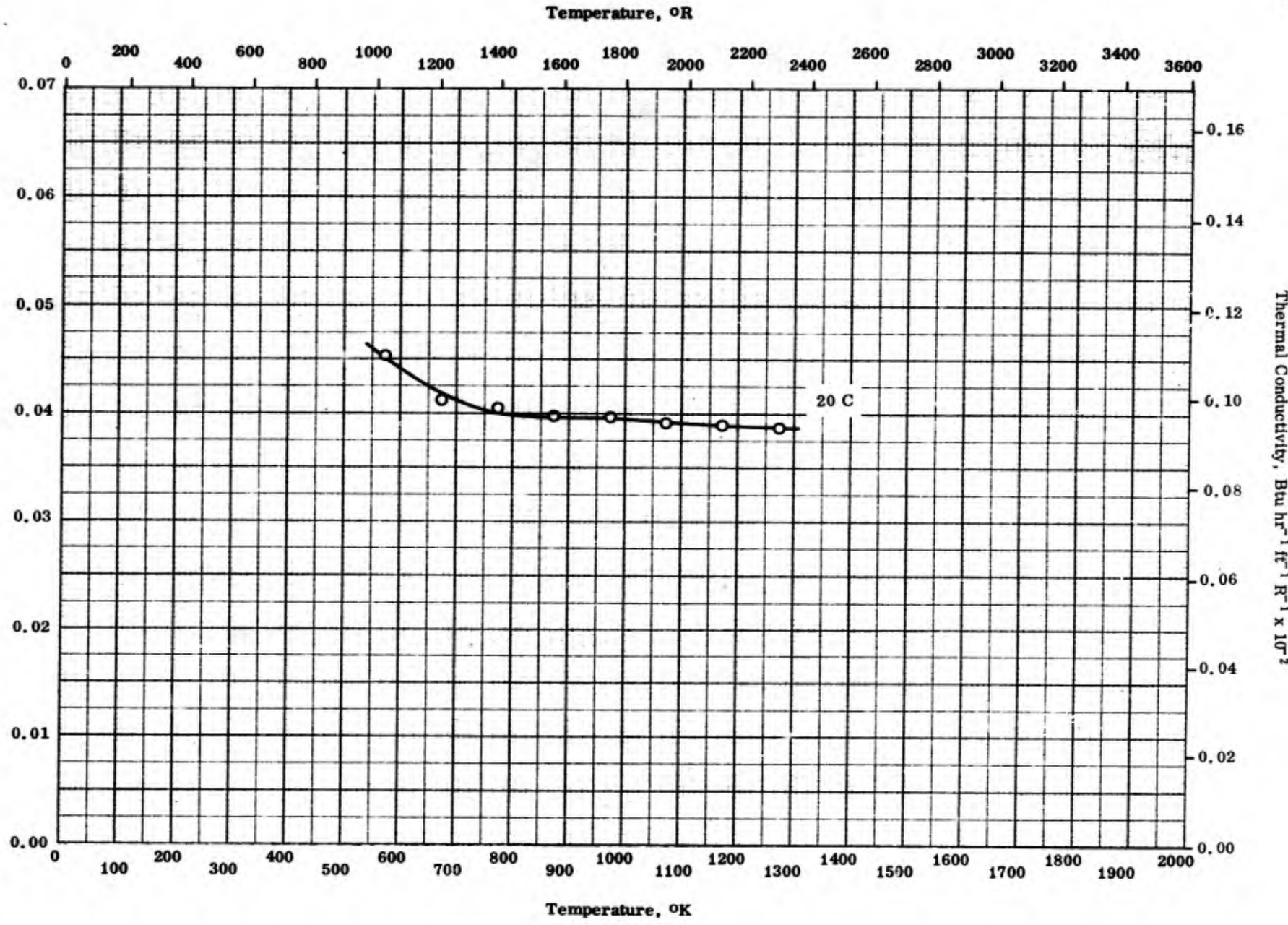
Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
◁	52-37	298-1623		Same as above.	Same as above except measured perpendicular to hot pressing direction.

SPECIFIC HEAT -- BORON NITRIDE + GRAPHITE

SPECIFIC HEAT -- BORON NITRIDE + GRAPHITE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-21	303-873	<3	80 BN and 20 C.	

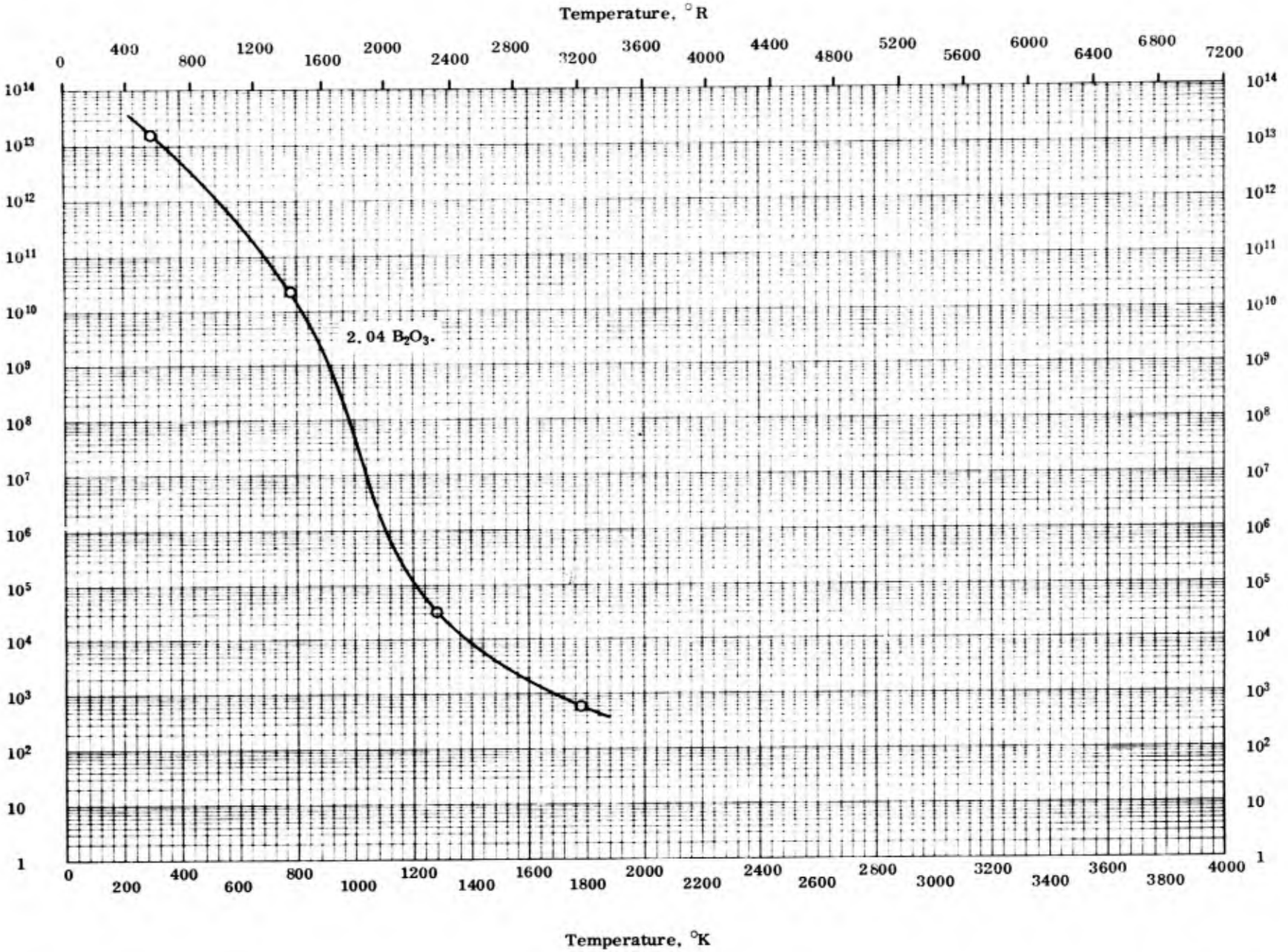


THERMAL CONDUCTIVITY -- BORON NITRIDE + GRAPHITE

THERMAL CONDUCTIVITY -- BORON NITRIDE + GRAPHITE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-4	573-1273	± 4-± 6	80 BN and 20 C; density 1.621 g cm^{-3} (72% of theoretical).	Pressed; measured parallel to the pressing direction.

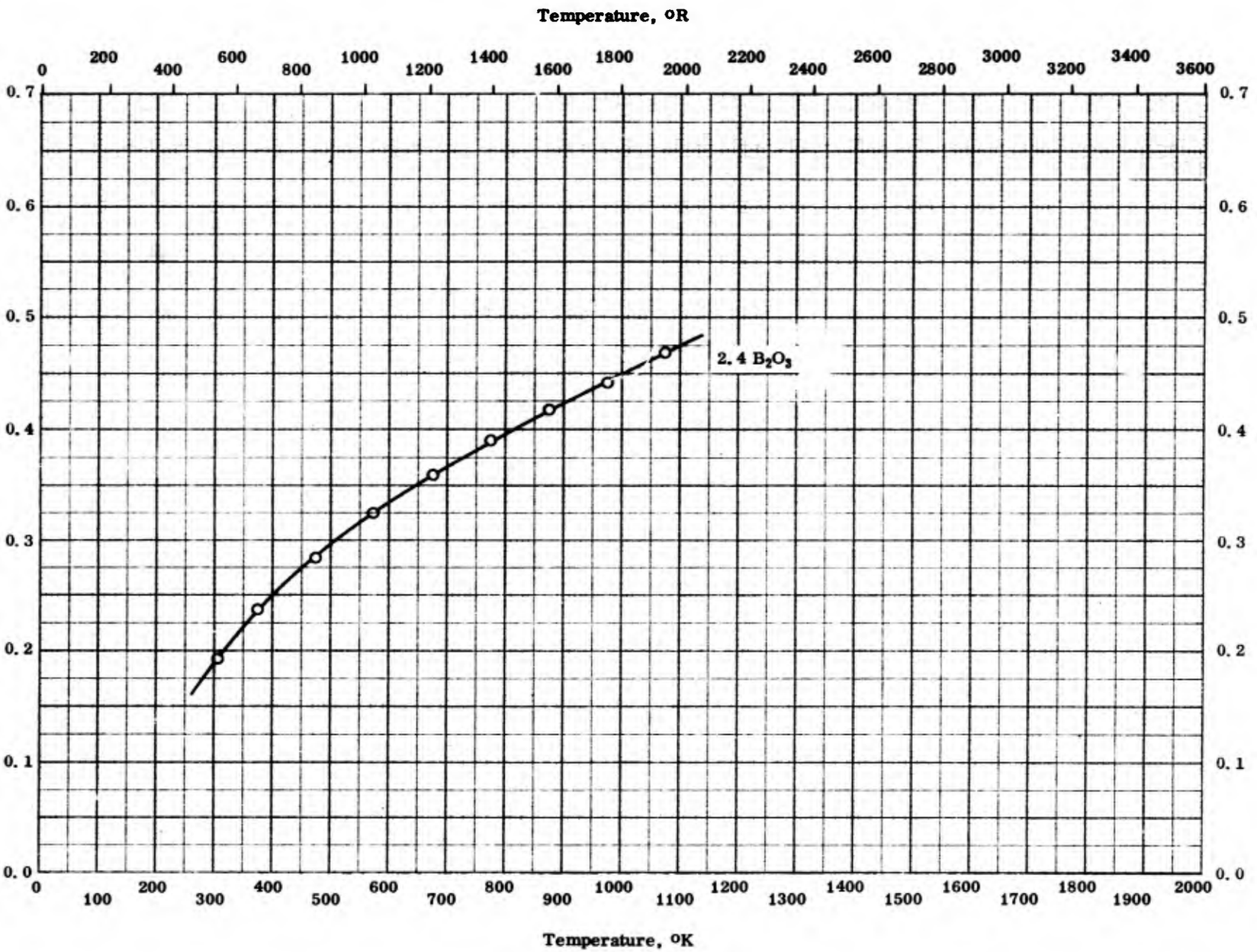


ELECTRICAL RESISTIVITY -- BORON NITRIDE + BORON OXIDE

ELECTRICAL RESISTIVITY -- BORON NITRIDE + BORON OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-6	298-1773		97 BN, 2.04 B_2O_3, 0.25 SiO_2, 0.15 Al_2O_3, and 0.08 C; apparent density 131 lb ft^{-3}.	Meas. with electric field parallel to pressing direction.

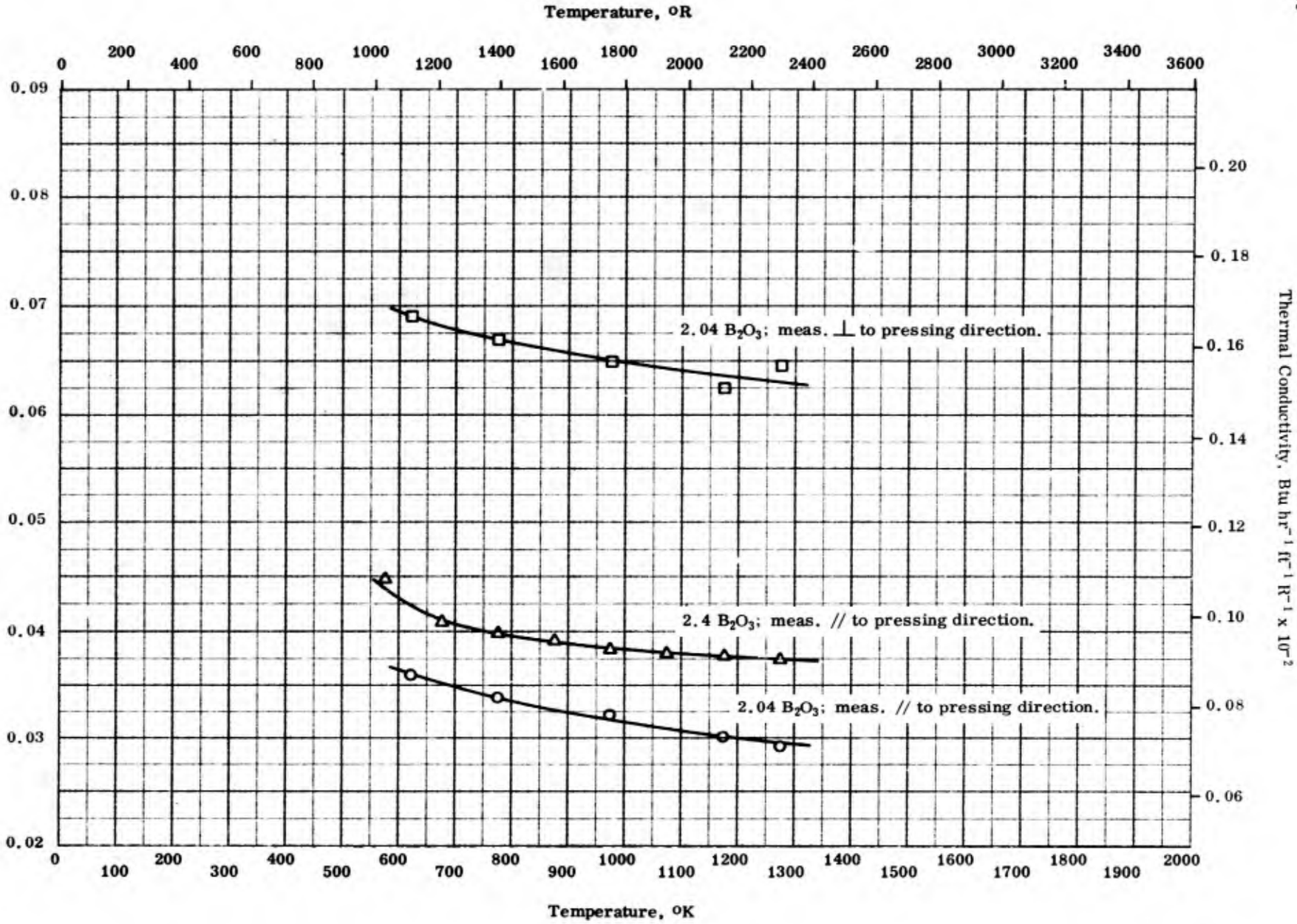


SPECIFIC HEAT -- BORON NITRIDE + BORON OXIDE

SPECIFIC HEAT -- BORON NITRIDE + BORON OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	62-21	303-1073	<3	97.4 BN, 2.4 B_2O_3, 0.2 Al, and 0.2 Si.	



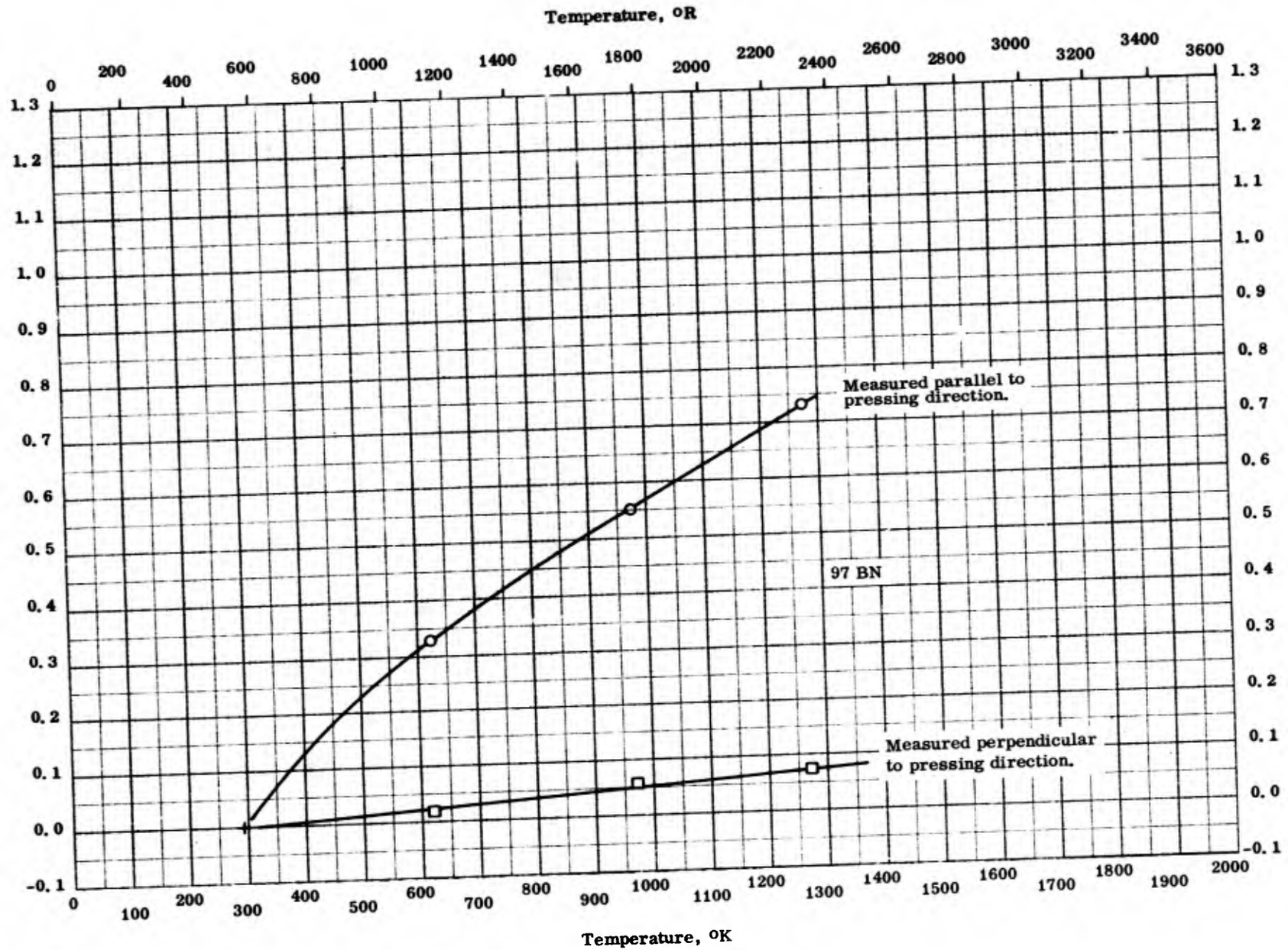
TPRC

THERMAL CONDUCTIVITY -- BORON NITRIDE + BORON OXIDE

THERMAL CONDUCTIVITY -- BORON NITRIDE + BORON OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
△	62-4	573-1273	±4-±6	2.4 B_2O_3, and 0.2 Al and Si; density 2.102 g cm^{-3} (94% of theoretical).	Pressed; measured parallel to pressing direction.
○	55-6	673-1273		97 BN, 2.04 B_2O_3, 0.25 SiO_2, 0.15 Al_2O_3, and 0.08 C; density 131 lb ft^{-3}.	Hot-pressed; measured parallel to pressing direction.
□	55-6	673-1273		Same as above.	Hot-pressed; measured normal to pressing direction.



THERMAL LINEAR EXPANSION -- BORON NITRIDE + BORON OXIDE

THERMAL LINEAR EXPANSION -- BORON NITRIDE + BORON OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-6	293-1273		97 BN, 2.04 B_2O_3, 0.25 SiO_2, 0.15 Al_2O_3, and 0.08 C; density 132 lb ft^{-3}.	Hot pressed; measured parallel to pressing direction.
□	55-6	293-1273		Same as above.	Hot pressed; measured perpendicular to pressing direction.

PROPERTIES OF SILICON NITRIDE + SILICON CARBIDE

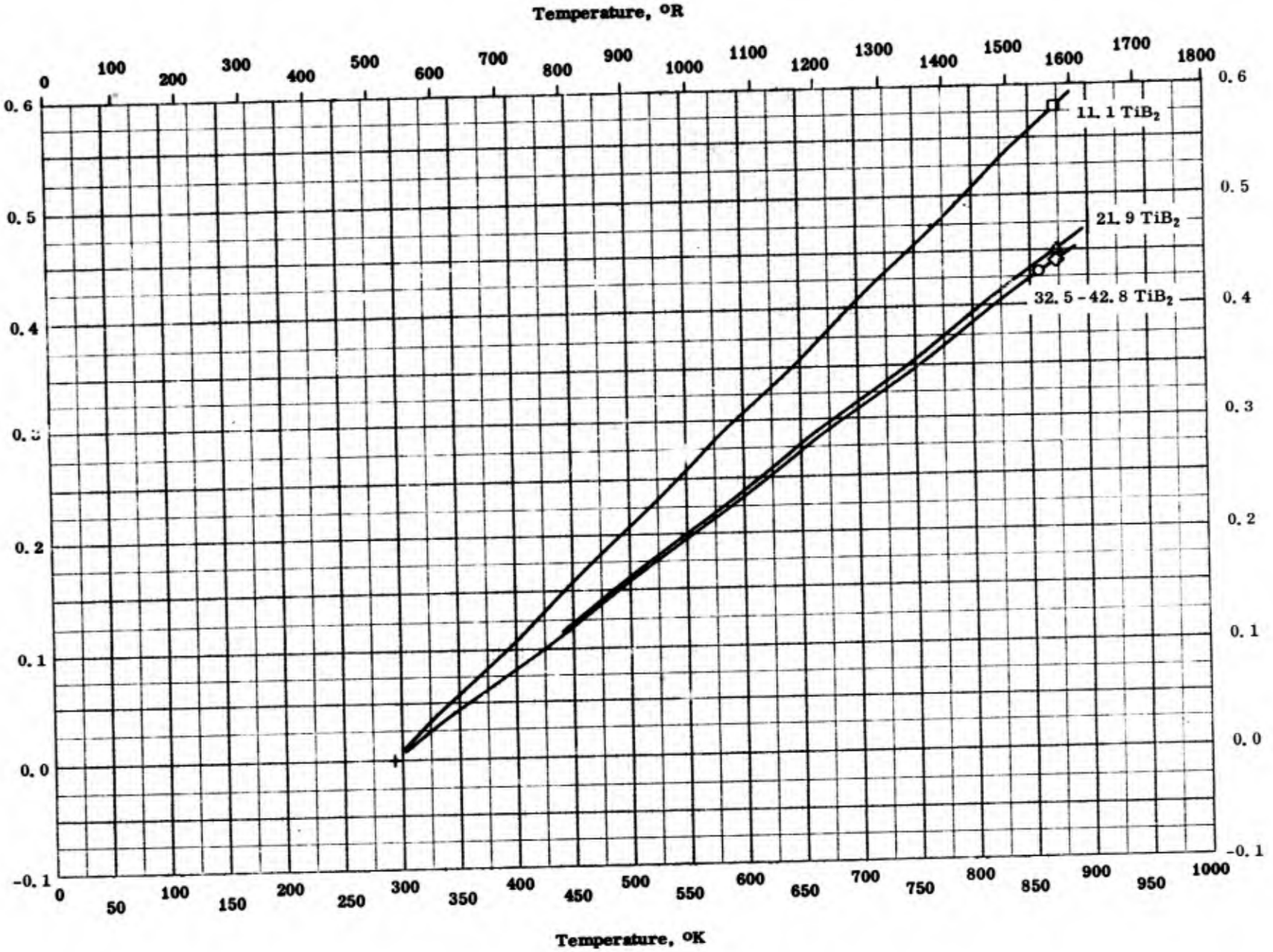
REPORTED VALUES

Density	$g\ cm^{-3}$	$lb\ ft^{-3}$
○ 20-25 SiC	3.2	199.7

PROPERTIES OF SILICON NITRIDE + SILICON CARBIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	60-22	298		75 - 80 Si_3N_4 and 20 - 25 SiC.	

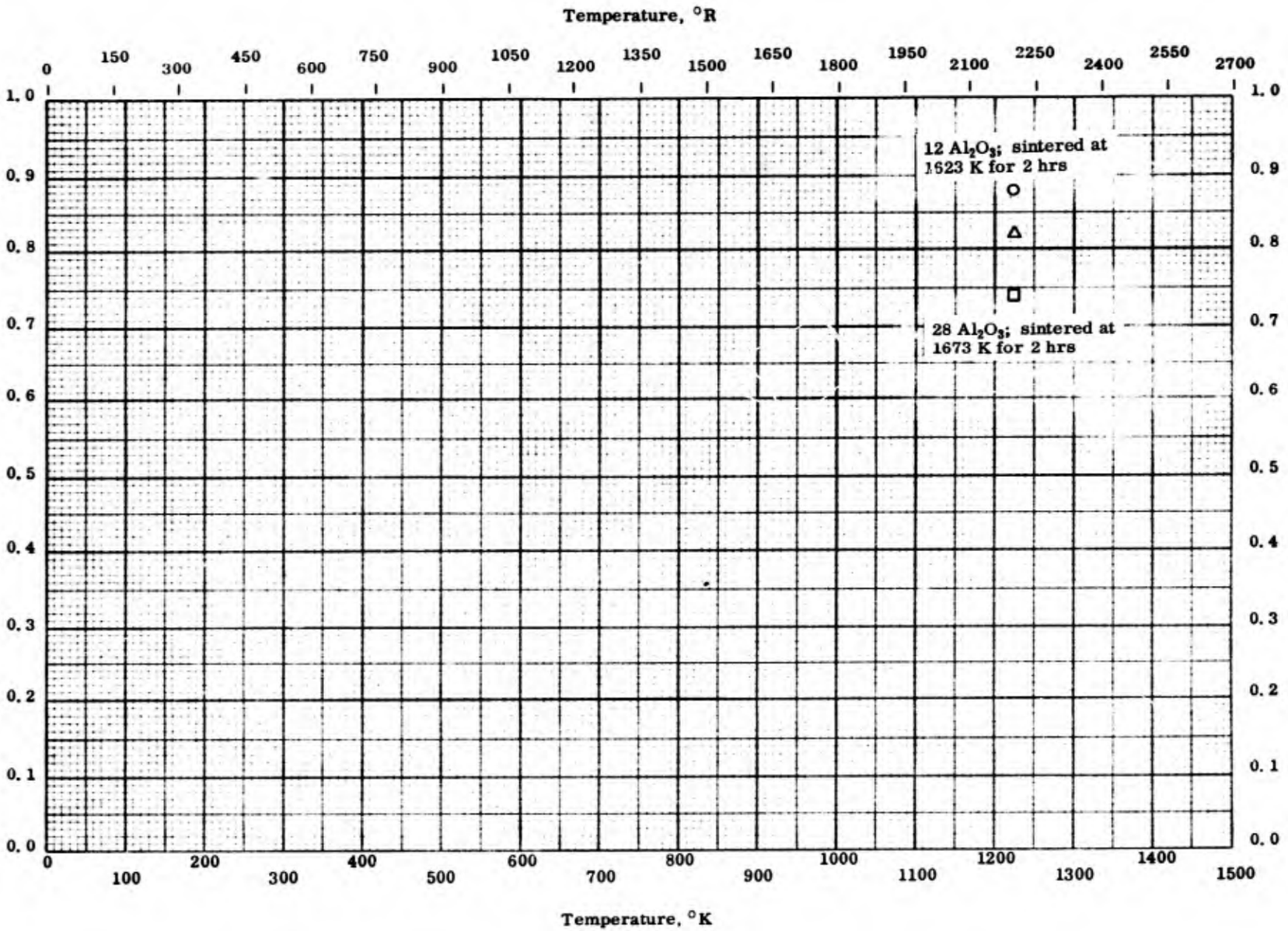


THERMAL LINEAR EXPANSION -- TITANIUM NITRIDE + TITANIUM DIBORIDE

THERMAL LINEAR EXPANSION -- TITANIUM NITRIDE + TITANIUM DIBORIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
□	55-10	293-873		88.9 TiN and 11.1 TiB_2; porosity 1 - 2%.	TiB_2 prepared by vacuum - thermal method; TiN prepared by nitriding Ti in a charge of $TiO_2 + 2C$; powdered TiB_2 and TiN pressed at high temperatures, then sintered.
△	55-10	293-873		78.1 TiN and 21.9 TiB_2; porosity 1 - 2%.	Same as above.
◇	55-10	293-873		67.5 TiN and 32.5 TiB_2; porosity 1 - 2%.	Same as above.
○	55-10	293-858		57.2 TiN and 42.8 TiB_2; porosity 1 - 2%.	Same as above.

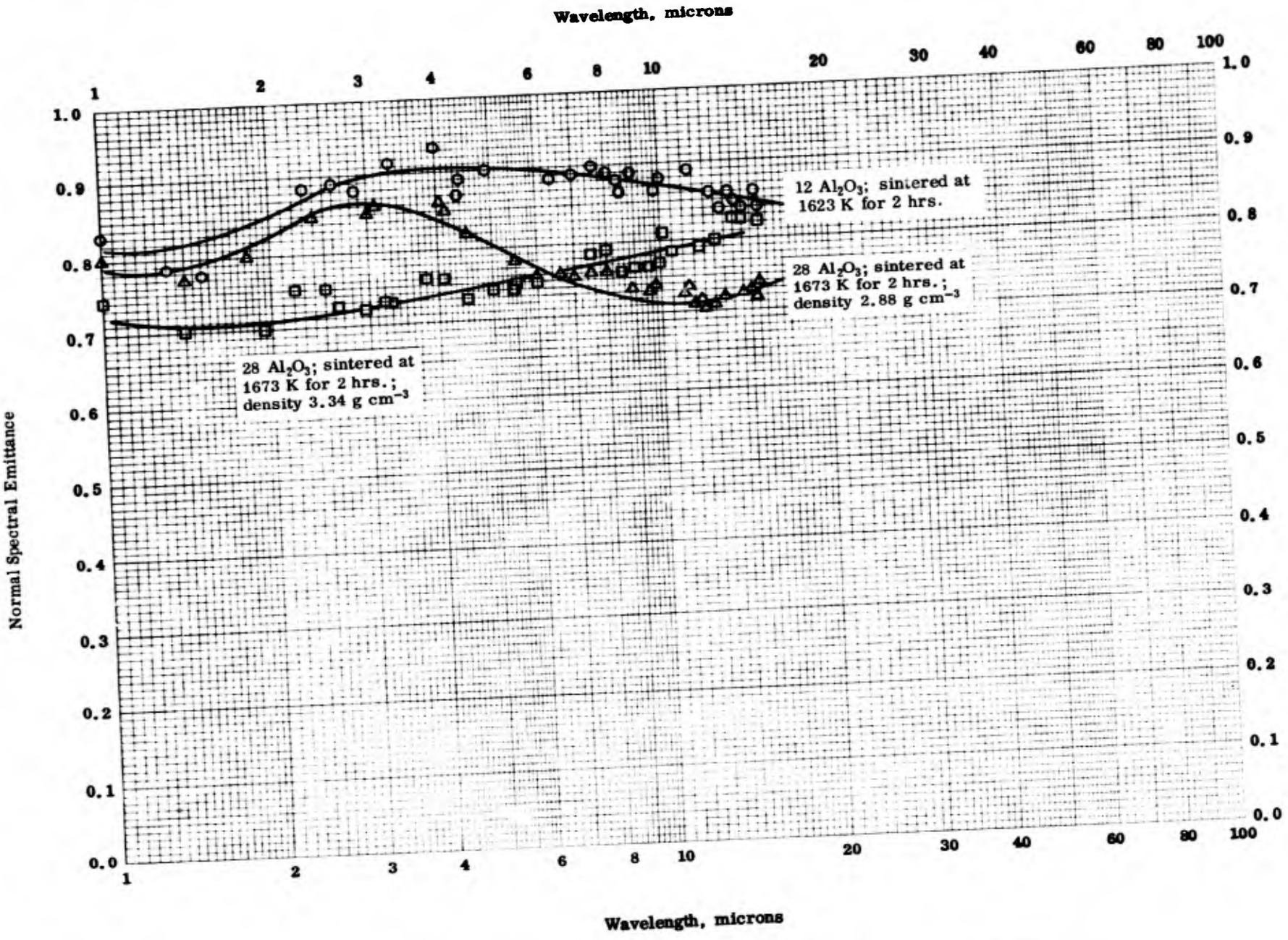


NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + ALUMINUM OXIDE

NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	88 Ni Al and 12 Al_2O_3; 0.1 in. thickness plate.	Sintered at 1623 K for 2 hrs; measured in argon atom.; calculated from spectral data.
△	63-18	1223	± 8	72 Ni Al and 28 Al_2O_3; 0.04 in. thickness plate; density 2.88 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
□	63-18	1223	± 8	72 Ni Al and 28 Al_2O_3; 0.087 in. thickness plate; density 3.34 g cm^{-3}.	Same as above.

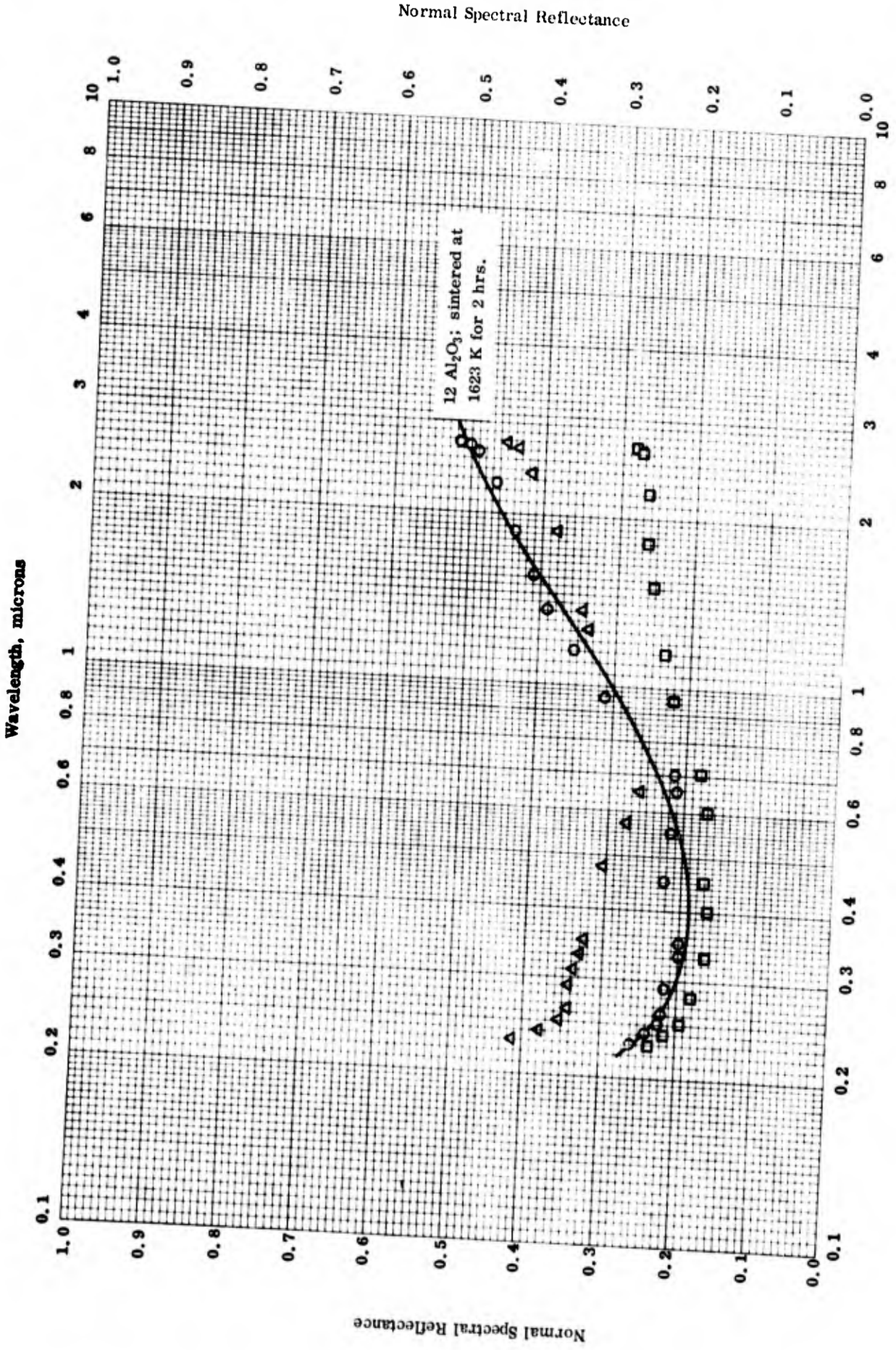


NORMAL SPECTRAL EMITTANCE -- NICKEL ALUMINIDE + ALUMINUM OXIDE

NORMAL SPECTRAL EMITTANCE — NICKEL ALUMINIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15		88 Ni Al and 12 Al_2O_3; 0.1 in. thickness plate; density 3.32 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1223	1-15		72 Ni Al and 28 Al_2O_3; 0.04 in. thickness plate; density 2.88 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
□	63-18	1223	1-15		72 Ni Al and 28 Al_2O_3; 0.087 in. thickness plate; density 3.34 g cm^{-3}.	Same as above.

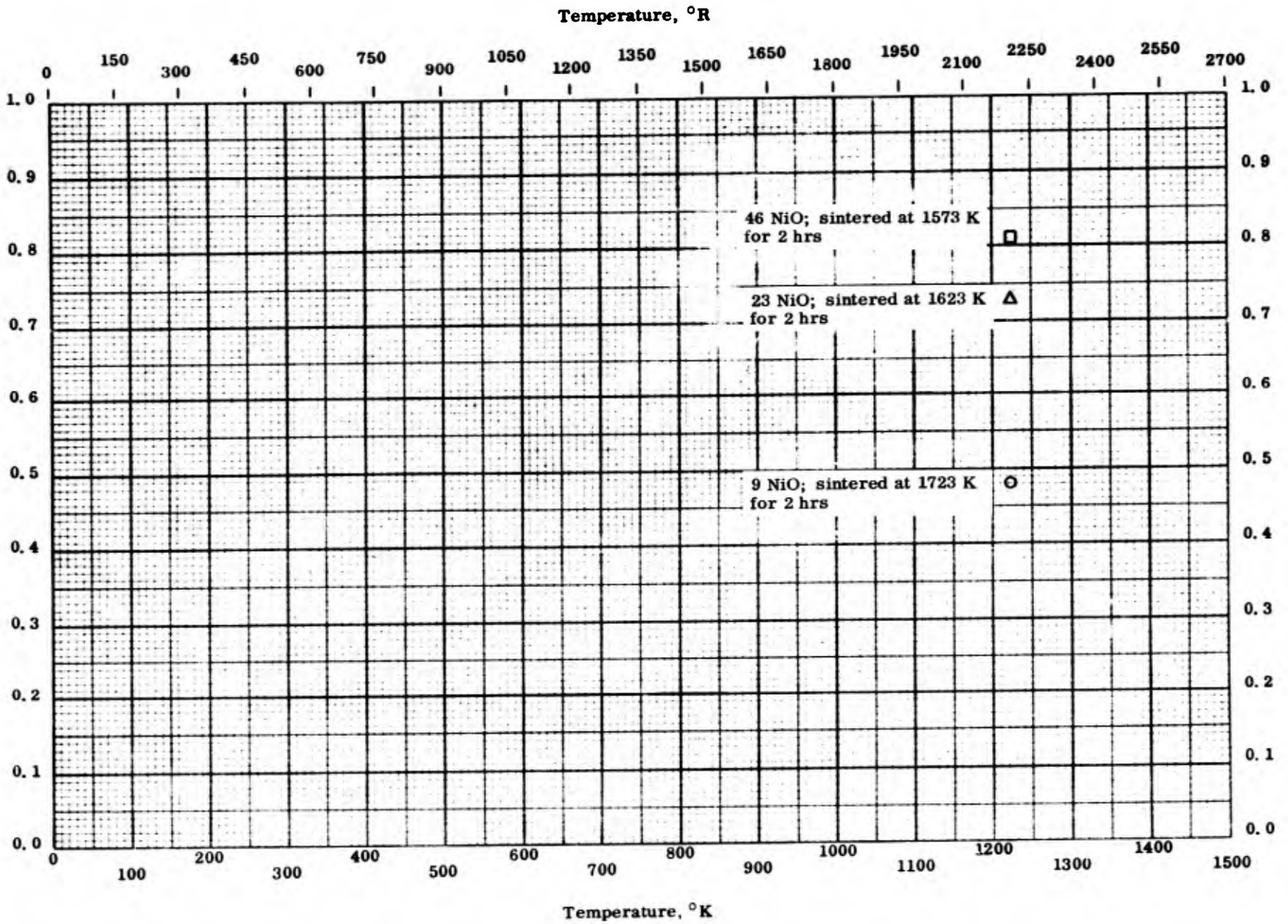


NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE + ALUMINUM OXIDE

NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE +ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	88 Ni Al and 12 Al_2O_3; 0.1 in. thickness plate; density 3.32 g cm^{-3}.	Sintered at 1623 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	72 Ni Al and 28 Al_2O_3; 0.04 in. thickness plate; density 2.88 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
□	63-18	298	0.23-2.65	5	72 Ni Al and 28 Al_2O_3; 0.087 in. thickness plate; density 3.34 g cm^{-3}.	Same as above.

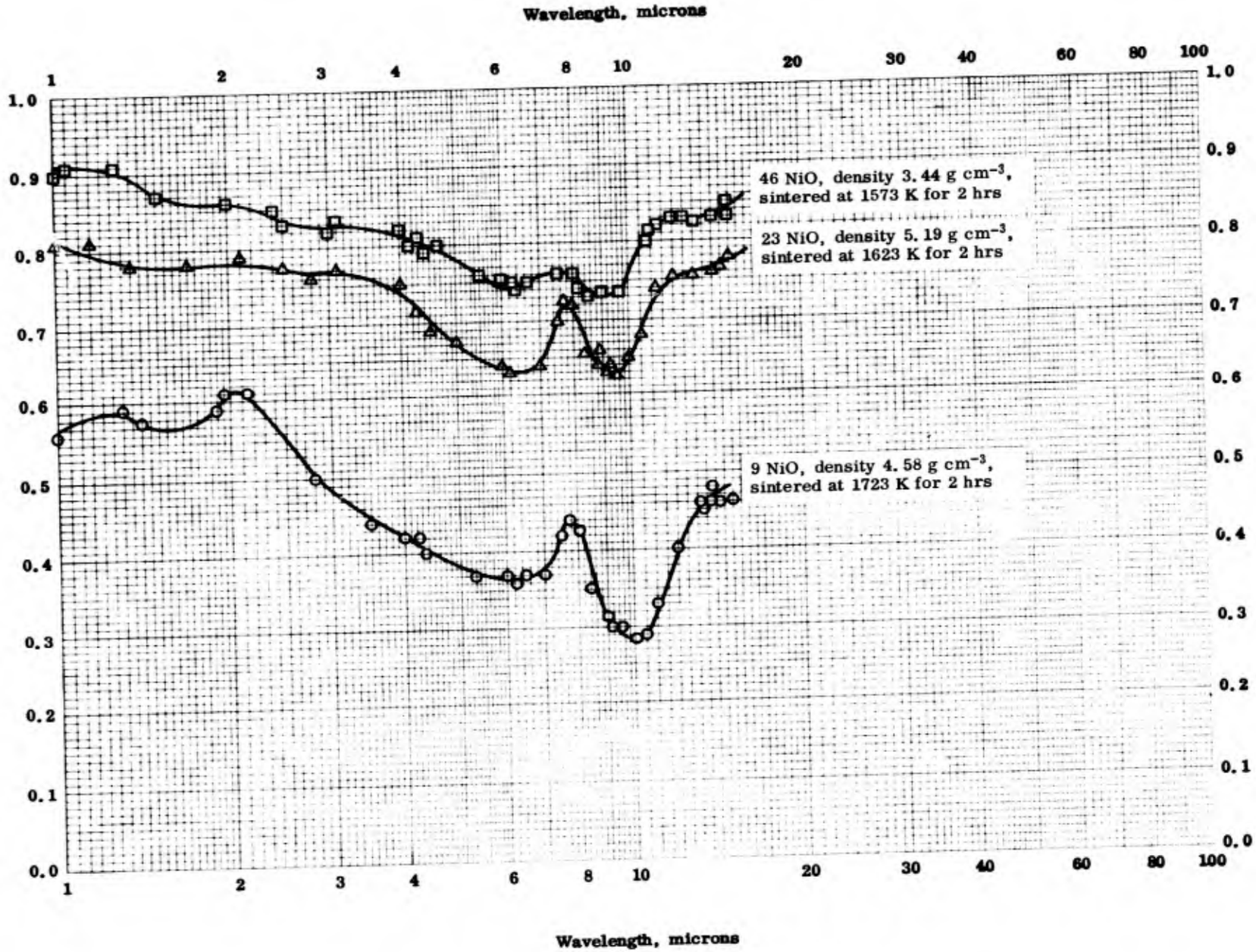


NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	91 NiAl and 9 NiO; 0.05 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon; calculated from spectral data.
△	63-18	1223	± 8	77 NiAl and 23 NiO; 0.08 in. thickness plate; density 5.19 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.
□	63-18	1223	± 8	54 NiAl and 46 NiO; 0.047 in. thickness plate; density 3.44 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

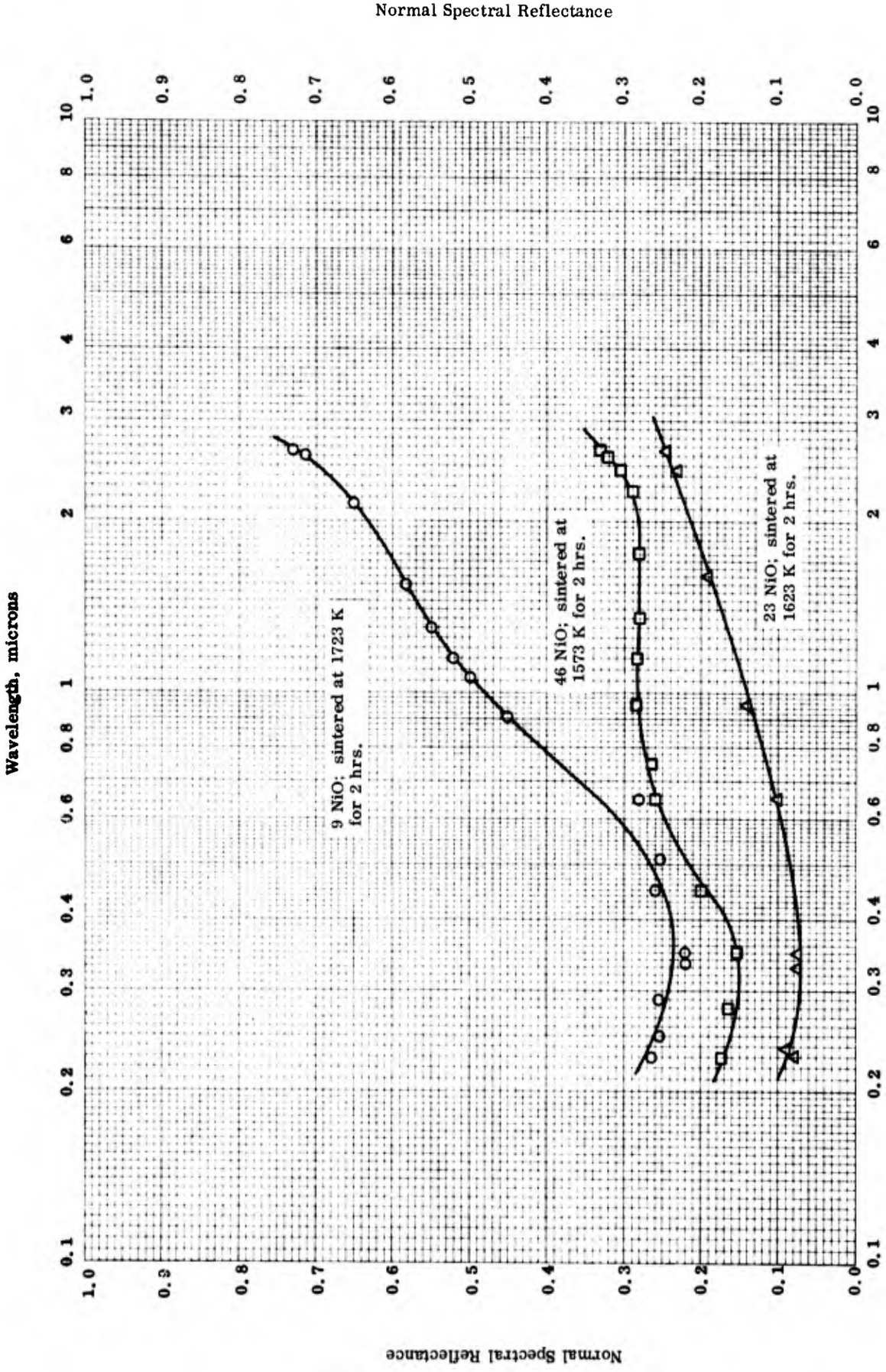


NORMAL SPECTRAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

NORMAL SPECTRAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	6[illegible]-18	1223	1-15		91 NiAl and 9 NiO; 0.05 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon; data taken from a curve.
△	63-18	1223	1-15		77 NiAl and 23 NiO; 0.08 in. thickness plate; density 5.19 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.
□	63-18	1223	1-15		54 NiAl and 46 NiO; 0.047 in. thickness plate; density 3.44 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

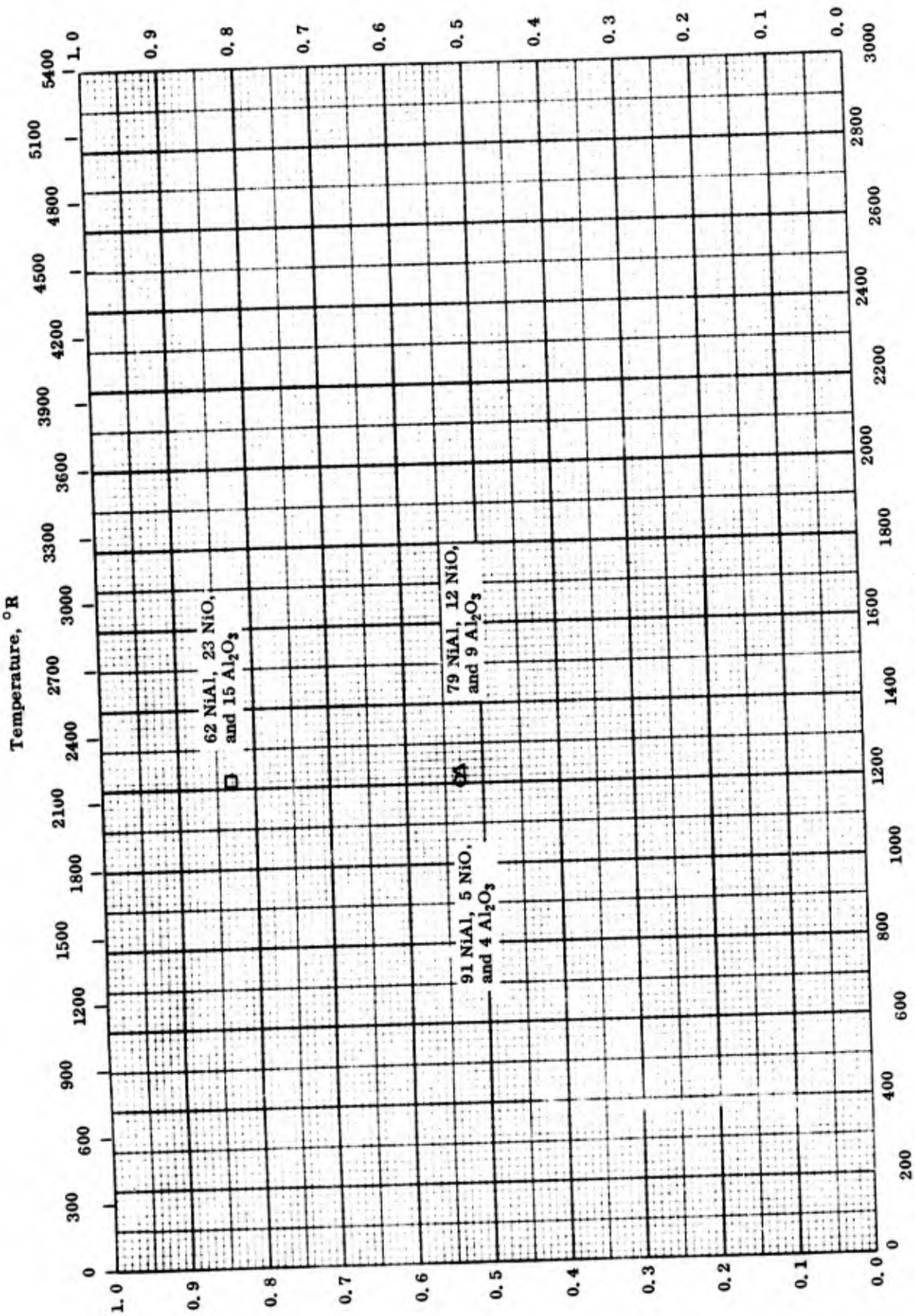


NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	91 NiAl and 9 NiO; 0.05 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	77 NiAl and 23 NiO; 0.08 in. thickness plate; density 5.19 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.
□	63-18	298	0.23-2.65	5	54 NiAl and 46 NiO; 0.047 in. thickness plate; density 3.44 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

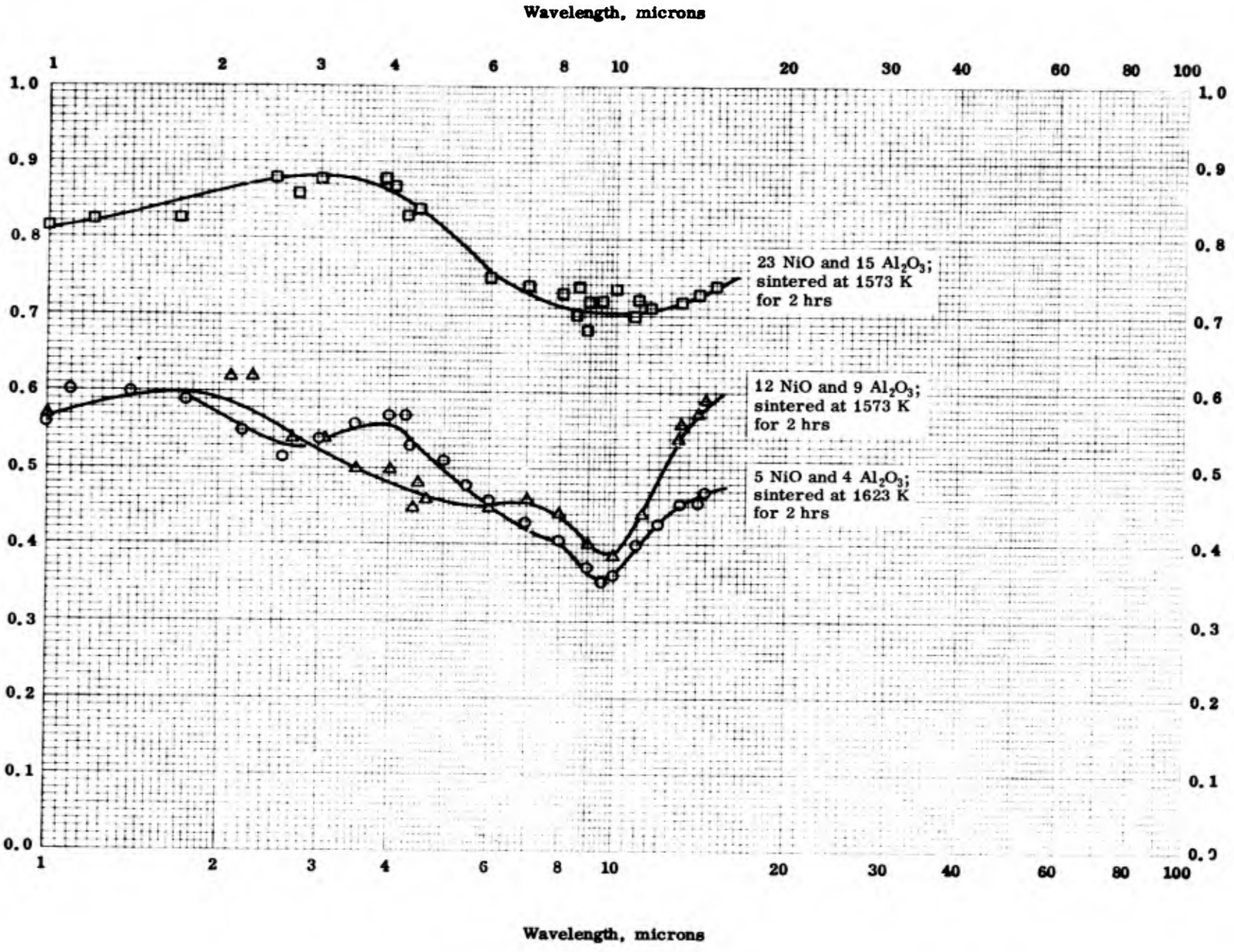


NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

NORMAL TOTAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	91 NiAl, 5 NiO, and 4 Al_2O_3; 0.064 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
△	63-18	1273	± 8	79 NiAl, 12 NiO, and 9 Al_2O_3; 0.051 in. thickness plate; density 4.33 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.
□	63-18	1273	± 8	62 NiAl, 23 NiO, and 15 Al_2O_3; 0.056 in. thickness plate; density 4.31 g cm^{-3}.	Same as above.

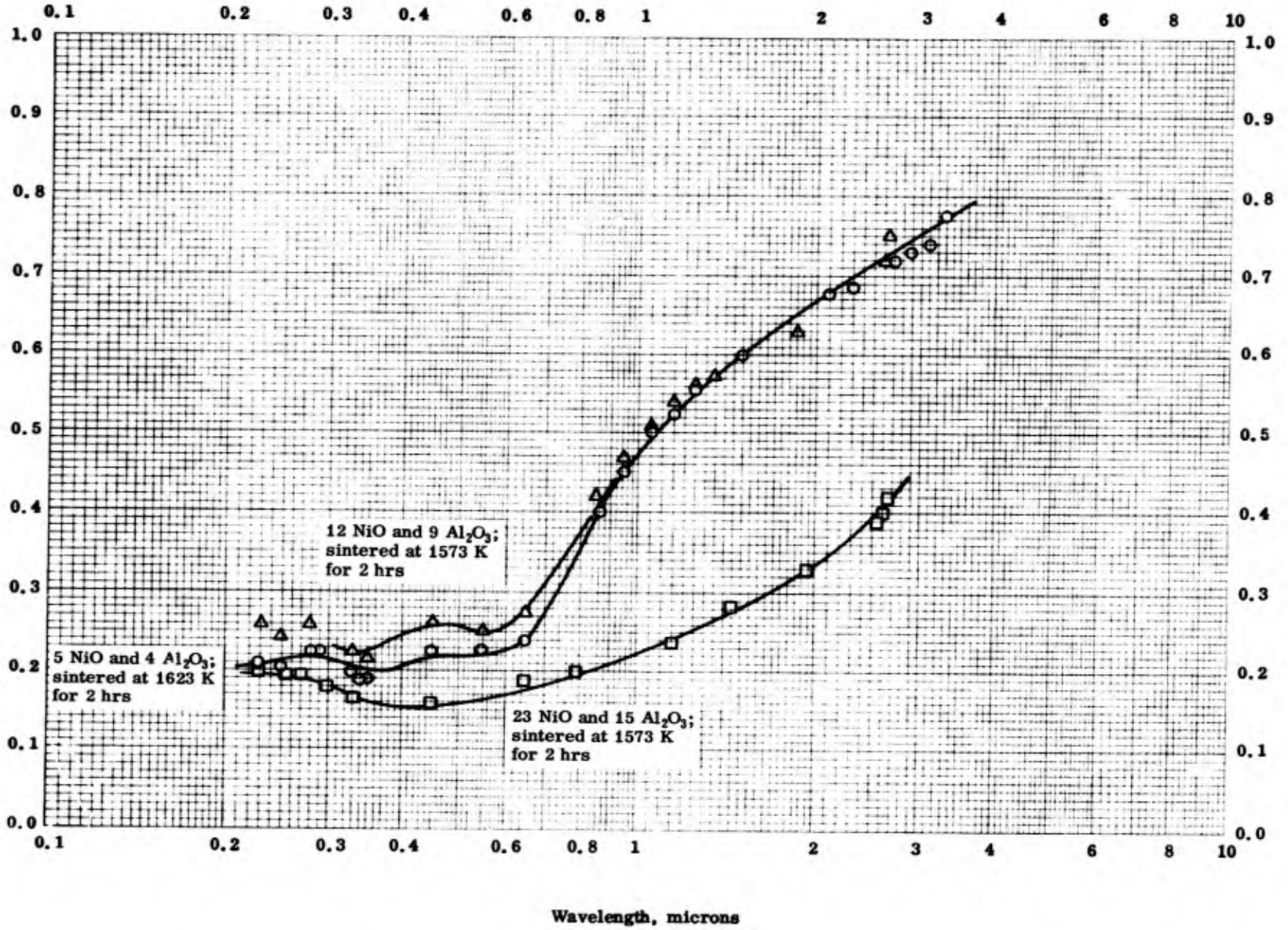


NORMAL SPECTRAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

NORMAL SPECTRAL EMITTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15	± 8	91 NiAl, 5 NiO, and 4 Al_2O_3; 0.064 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1273	1-15		79 NiAl, 12 NiO, and 9 Al_2O_3; 0.051 in. thickness plate; density 4.33 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.
□	63-18	1273	1-15		62 NiAl, 23 NiO, and 15 Al_2O_3; 0.056 in. thickness plate; density 4.31 g cm^{-3}.	Same as above.

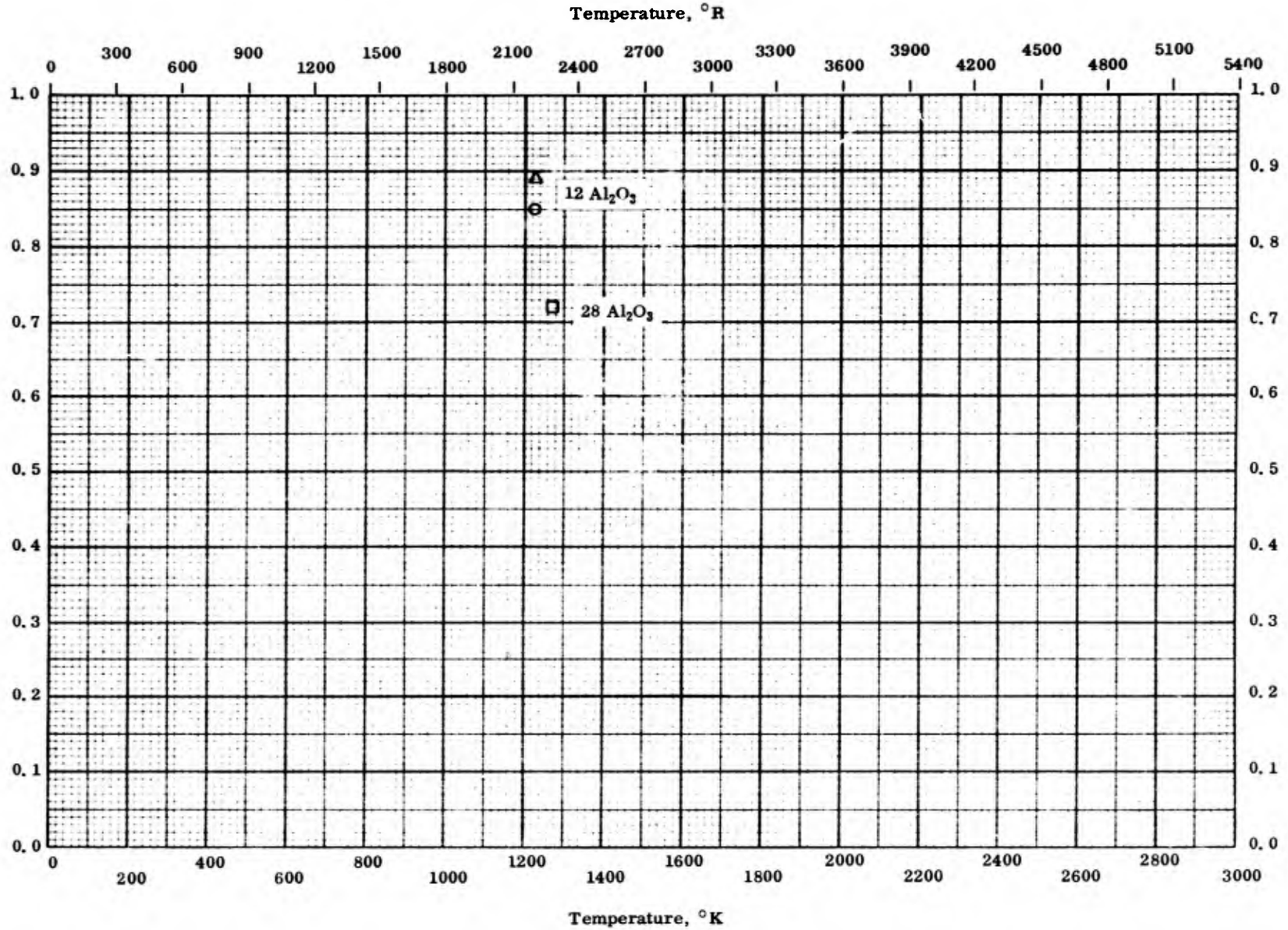


NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

NORMAL SPECTRAL REFLECTANCE -- NICKEL ALUMINIDE + NICKEL MONOXIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	91 NiAl, 5 NiO, and 4 Al_2O_3; 0.064 in. thickness plate; density 4.58 g cm^{-3}.	Sintered at 1623 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	79 NiAl, 12 NiO, and 9 Al_2O_3; 0.051 in. thickness plate; density 4.33 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.
□	63-18	298	0.23-2.65	5	62 NiAl, 23 NiO, and 15 Al_2O_3; 0.056 in. thickness plate; density 4.31 g cm^{-3}.	Same as above.

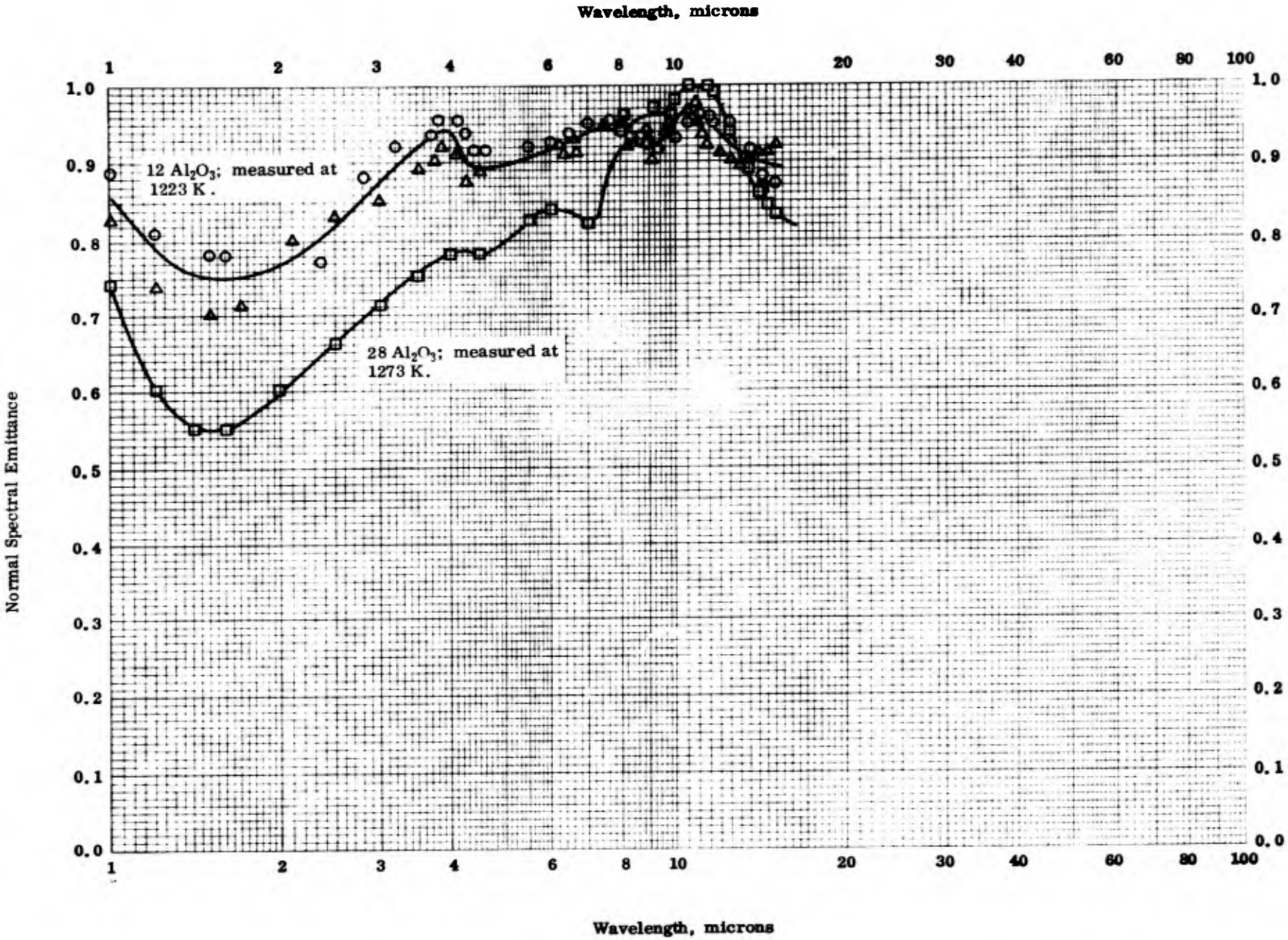


NORMAL TOTAL EMITTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

NORMAL TOTAL EMITTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	88 TiAl and 12 Al_2O_3; 0.064 in. thickness plate; density 2.60 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon; calculated from spectral data.
△	63-18	1223	± 8	88 TiAl and 12 Al_2O_3; 0.070 in. thickness plate; density 2.76 g cm^{-3}.	Same as above.
□	63-18	1273	± 8	72 TiAl and 28 Al_2O_3; 0.062 in. thickness plate; density 2.36 g cm^{-3}.	Same as above.



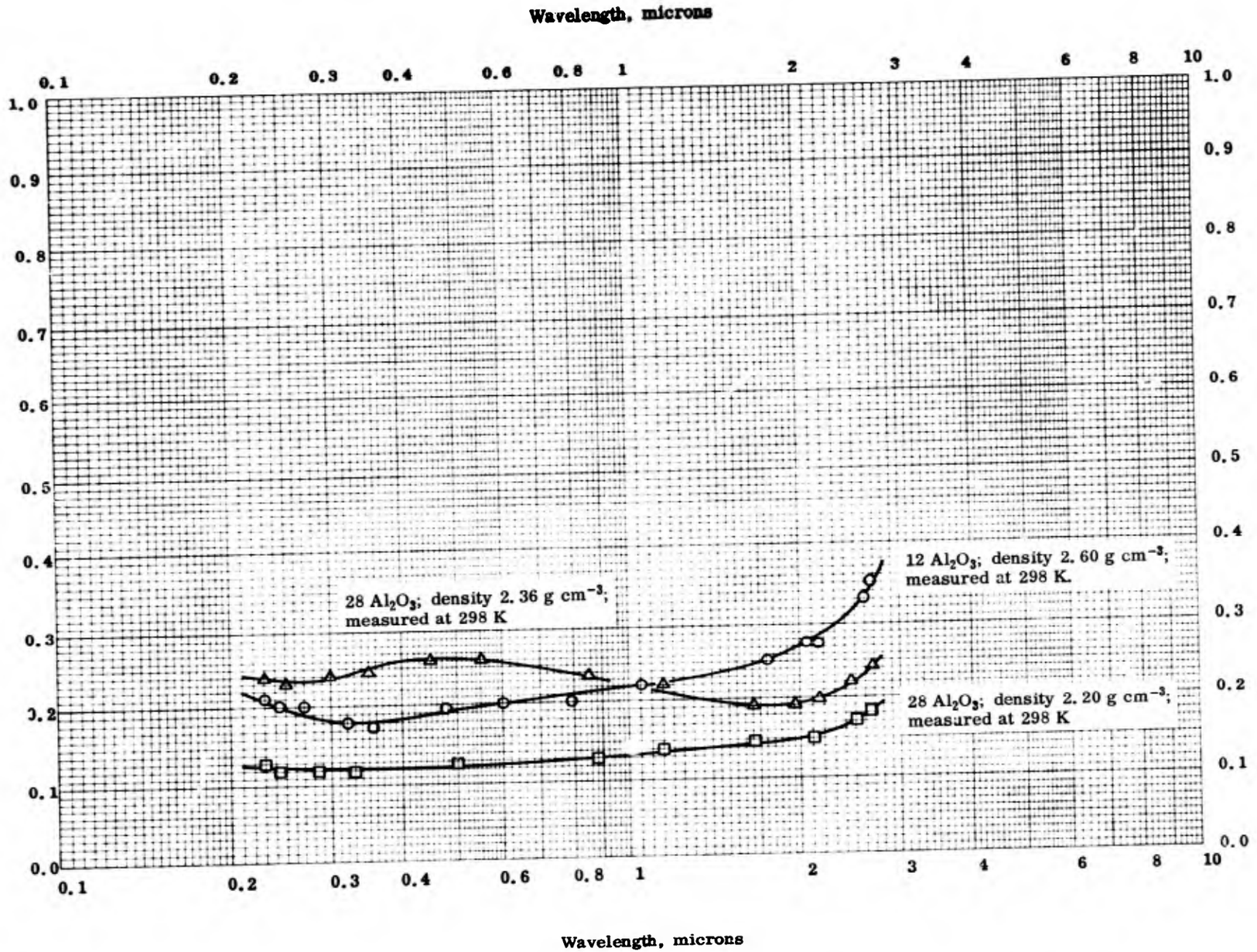
NORMAL SPECTRAL EMITTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
△	63-18	1223	1-15		88 TiAl and 12 Al_2O_3; 0.064 in. thickness plate; density 2.60 gm cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon; data taken from a curve.
○	63-18	1223	1-15		88 TiAl and 12 Al_2O_3; 0.070 in. thickness plate; density 2.76 gm cm^{-3}.	Same as above.
□	63-18	1273	1-15		72 TiAl and 28 Al_2O_3; 0.062 in. thickness plate; density 2.36 gm cm^{-3}.	Same as above.

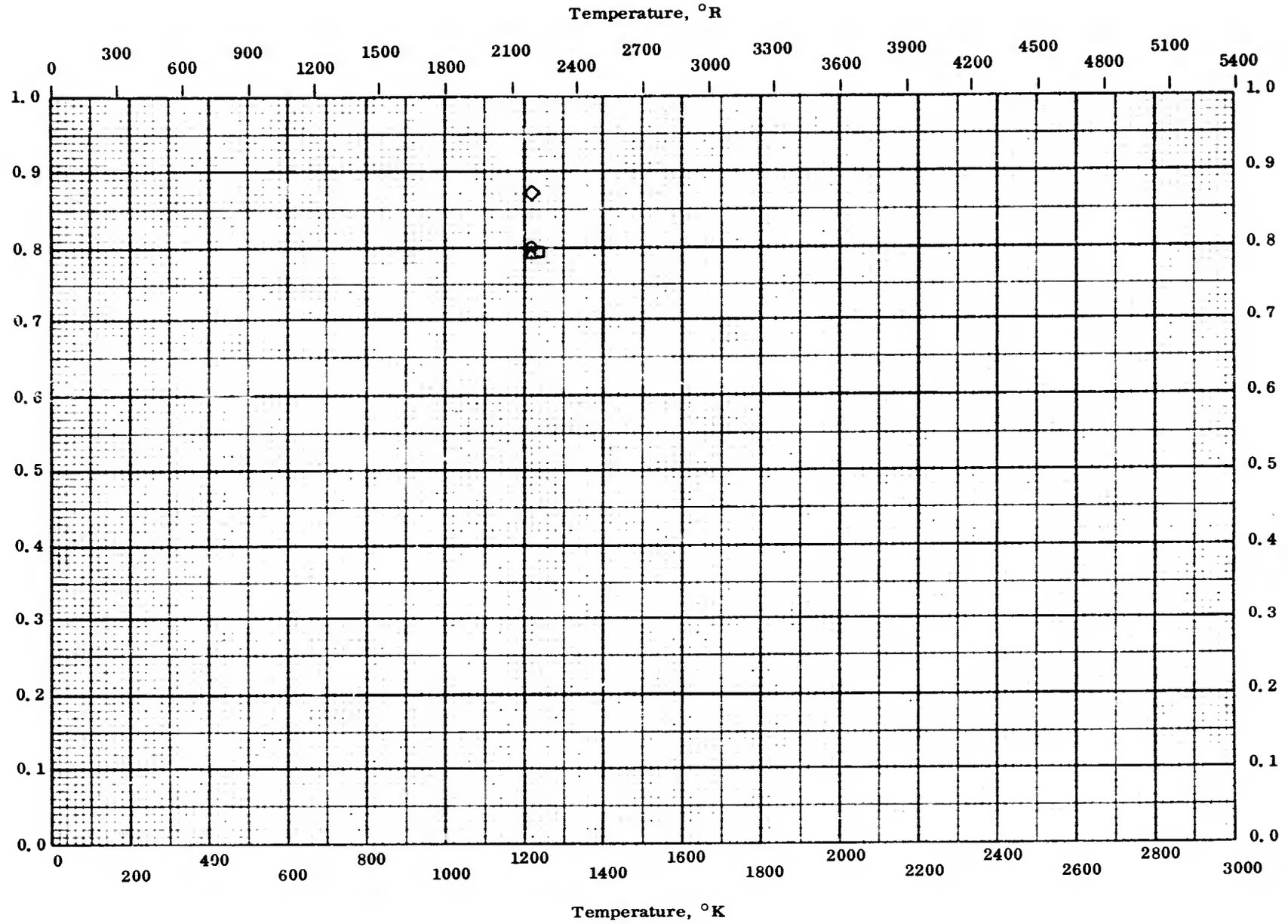


NORMAL SPECTRAL REFLECTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

NORMAL SPECTRAL REFLECTANCE -- TITANIUM ALUMINIDE + ALUMINUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	88 TiAl and 12 Al_2O_3; 0.064 in. thickness plate; density 2.60 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	72 TiAl and 28 Al_2O_3; 0.062 in. thickness plate; density 2.36 g cm^{-3}.	Same as above.
□	63-18	298	0.23-2.65	5	72 TiAl and 28 Al_2O_3; 0.057 in. thickness plate; density 2.20 g cm^{-3}.	Same as above.



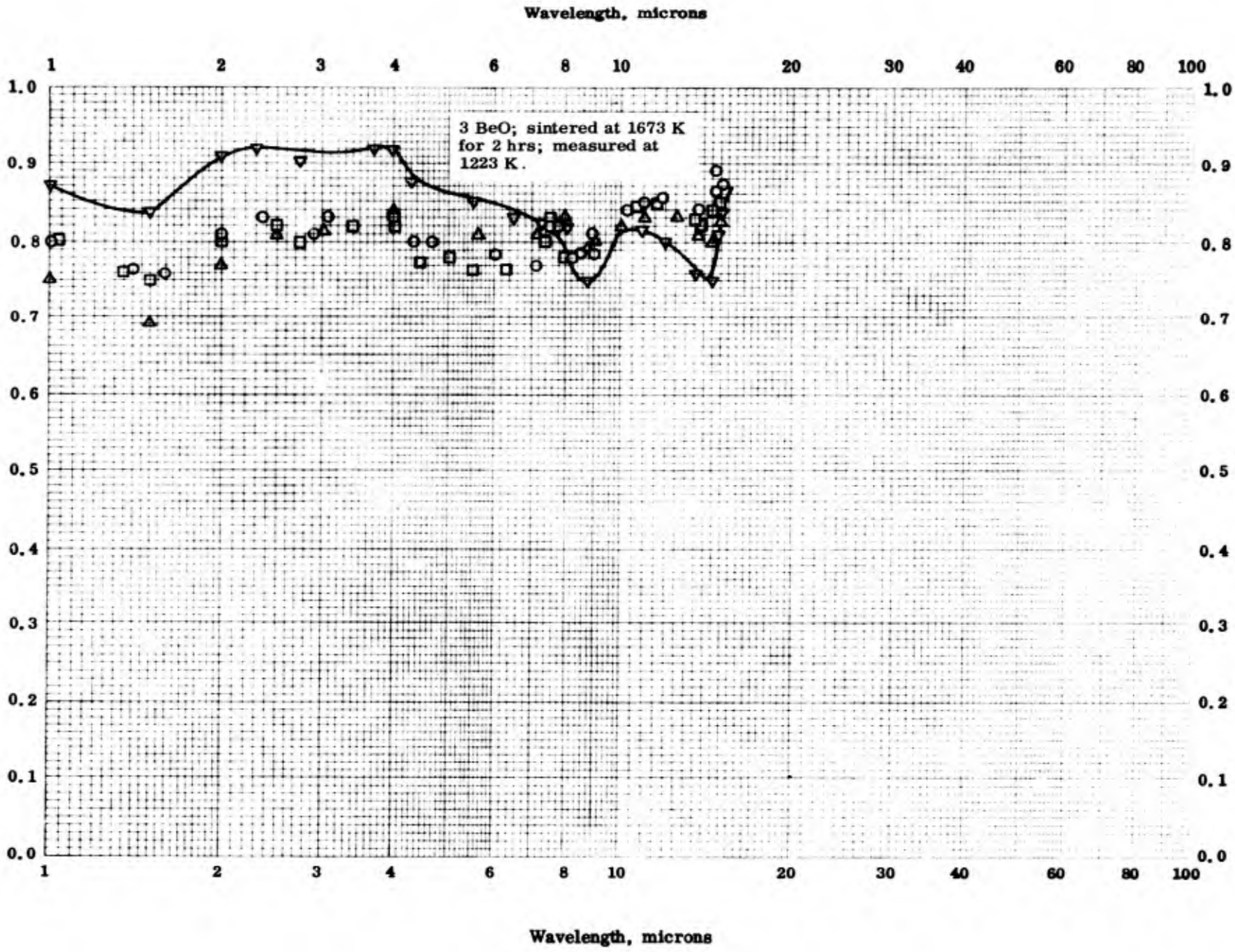
TPRC

NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	92 $TaBe_{12}$ and 8 BeO; 0.053 in. thickness plate; density 2.46 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
△	63-18	1223	± 8	92 $TaBe_{12}$ and 8 BeO; 0.062 in. thickness plate; density 2.38 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.
□	63-18	1223	± 8	79 $TaBe_{12}$ and 21 BeO; 0.062 in. thickness plate; density 2.21 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
◇	63-18	1223	± 8	97 $TaBe_{12}$ and 3 BeO; 0.06 in. thickness plate; density 2.60 g cm^{-3}.	Same as above.

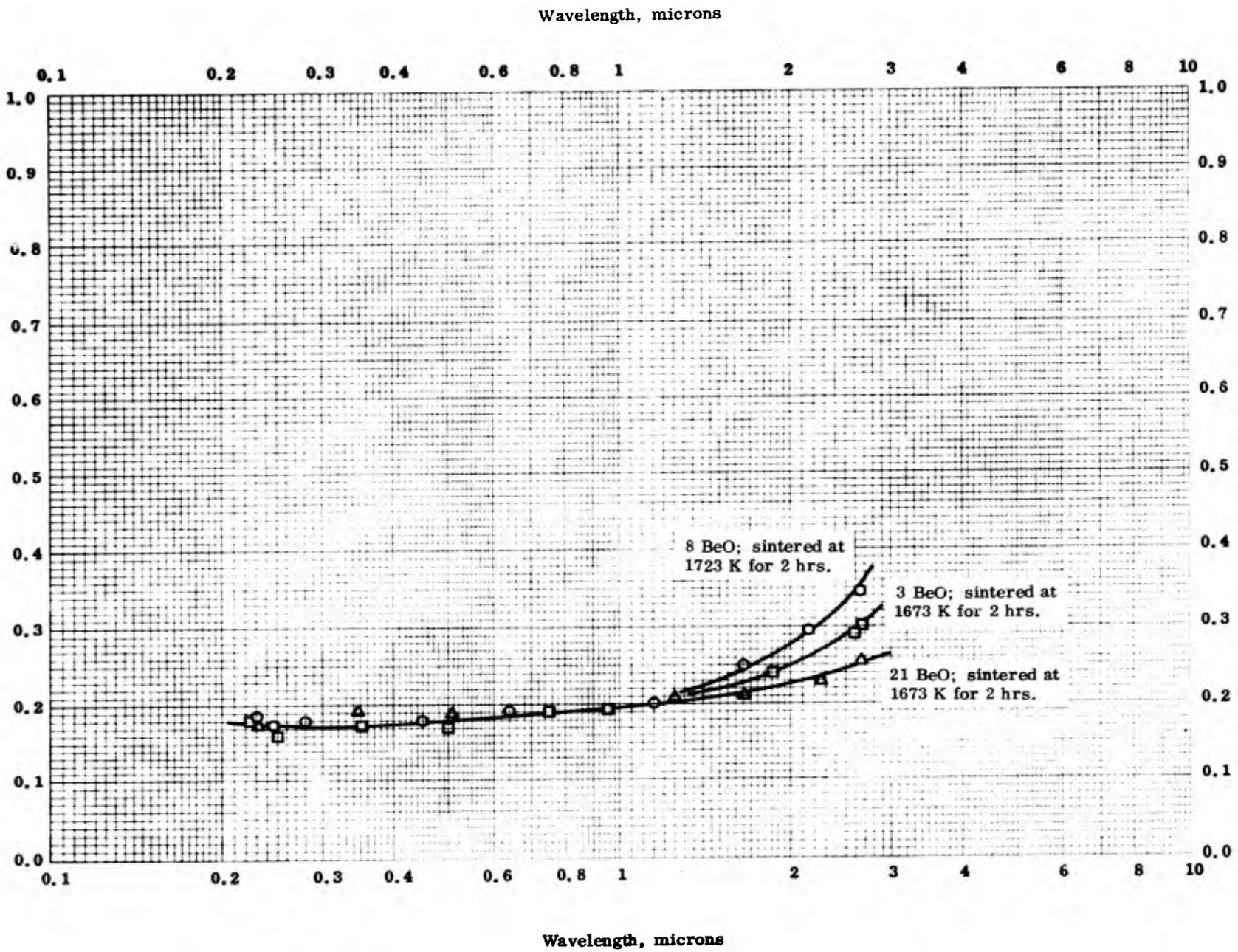


NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Ranve, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15		92 $TaBe_{12}$ and 8 BeO; 0.053 in. thickness plate; density 2.46 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1223	1-15		92 $TaBe_{12}$ and 8 BeO; 0.062 in. thickness plate; density 2.38 g cm^{-3}.	Same as above except sintered at 1623 K for 2 hrs.
□	63-18	1223	1-15		79 $TaBe_{12}$ and 21 BeO; 0.062 in. thickness plate; density 2.21 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
▽	63-18	1223	1-15		97 $TaBe_{12}$ and 3 BeO; 0.06 in. thickness plate; density 2.60 g cm^{-3}.	Same as above.

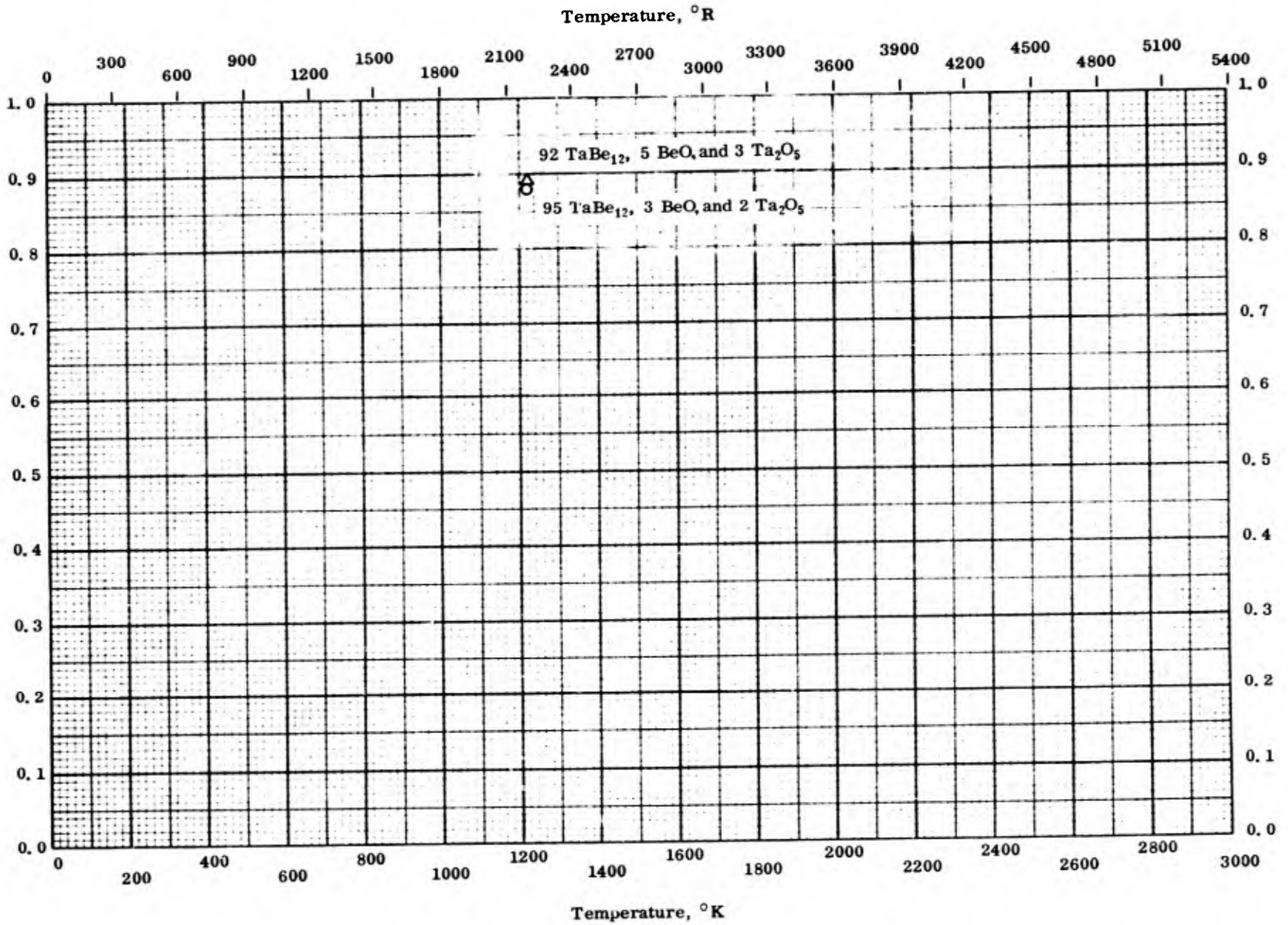


NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	92 $TaBe_{12}$ and 8 BeO; 0.053 in. thickness plate; density 2.46 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	79 $TaBe_{12}$ and 21 BeO; 0.062 in. thickness plate; density 2.21 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.
□	63-18	298	0.23-2.65	5	97 $TaBe_{12}$ and 3 BeO; 0.060 in. thickness plate; density 2.60 g cm^{-3}.	Same as above.

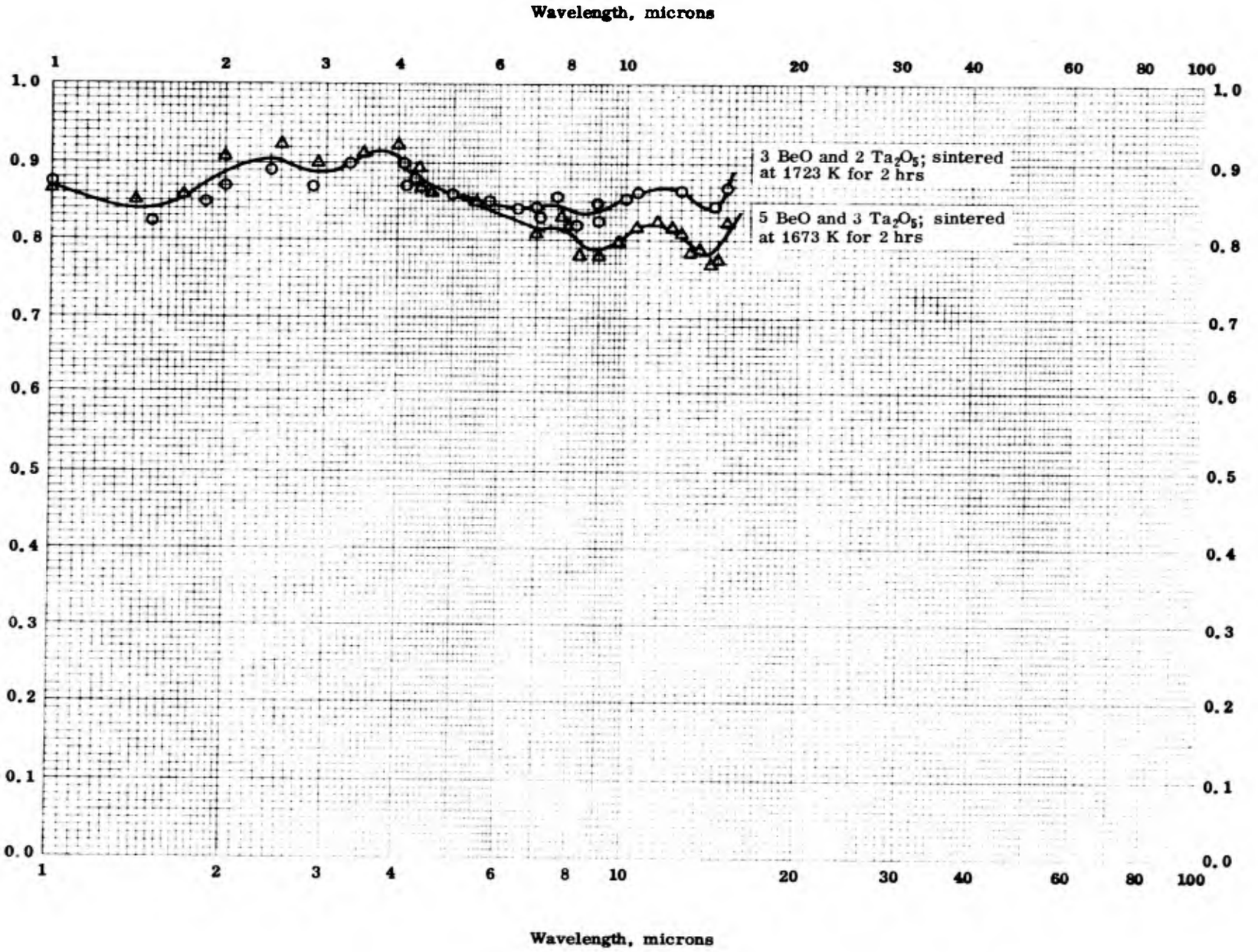


NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	95 $TaBe_{12}$, 3 BeO, and 2 Ta_2O_5; 0.055 in. thickness plate; density 2.56 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
Δ	63-18	1223	± 8	92 $TaBe_{12}$, 5 BeO, and 3 Ta_2O_5; 0.07 in. thickness plate; density 2.32 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.

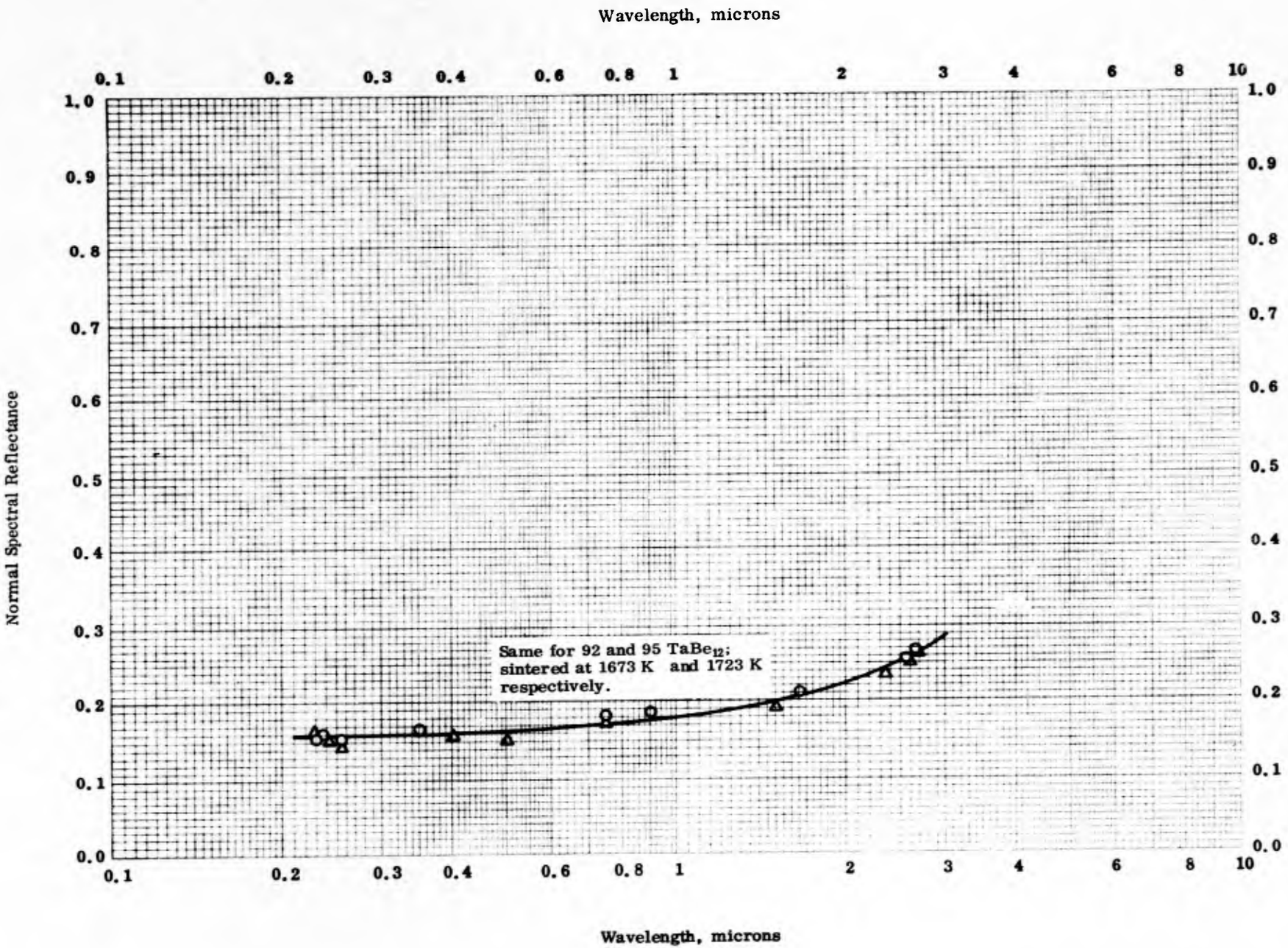


NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15		95 $TaBe_{12}$, 3 BeO, and 2 Ta_2O_5; 0.055 in. thickness plate; density 2.56 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1223	1-15		92 $TaBe_{12}$, 5 BeO, and 3 Ta_2O_5; 0.07 in. thickness plate; density 2.32 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.



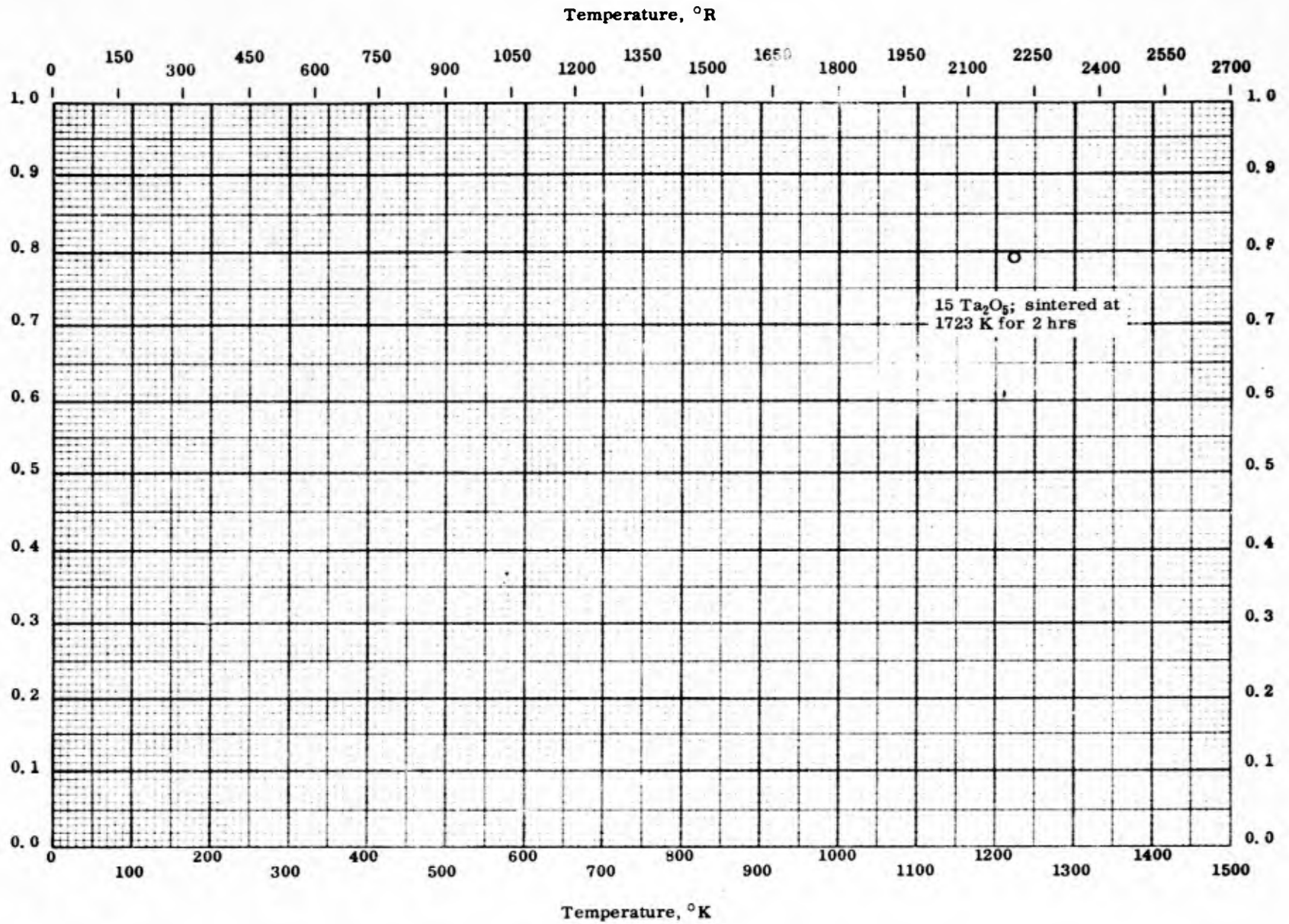
NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + BERYLLIUM OXIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	95 $TaBe_{12}$, 3 BeO, and 2 Ta_2O_5; 0.055 in. thickness plate; density 2.56 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	92 $TaBe_{12}$, 5 BeO, and 3 Ta_2O_5; 0.07 in. thickness plate; density 2.32 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.

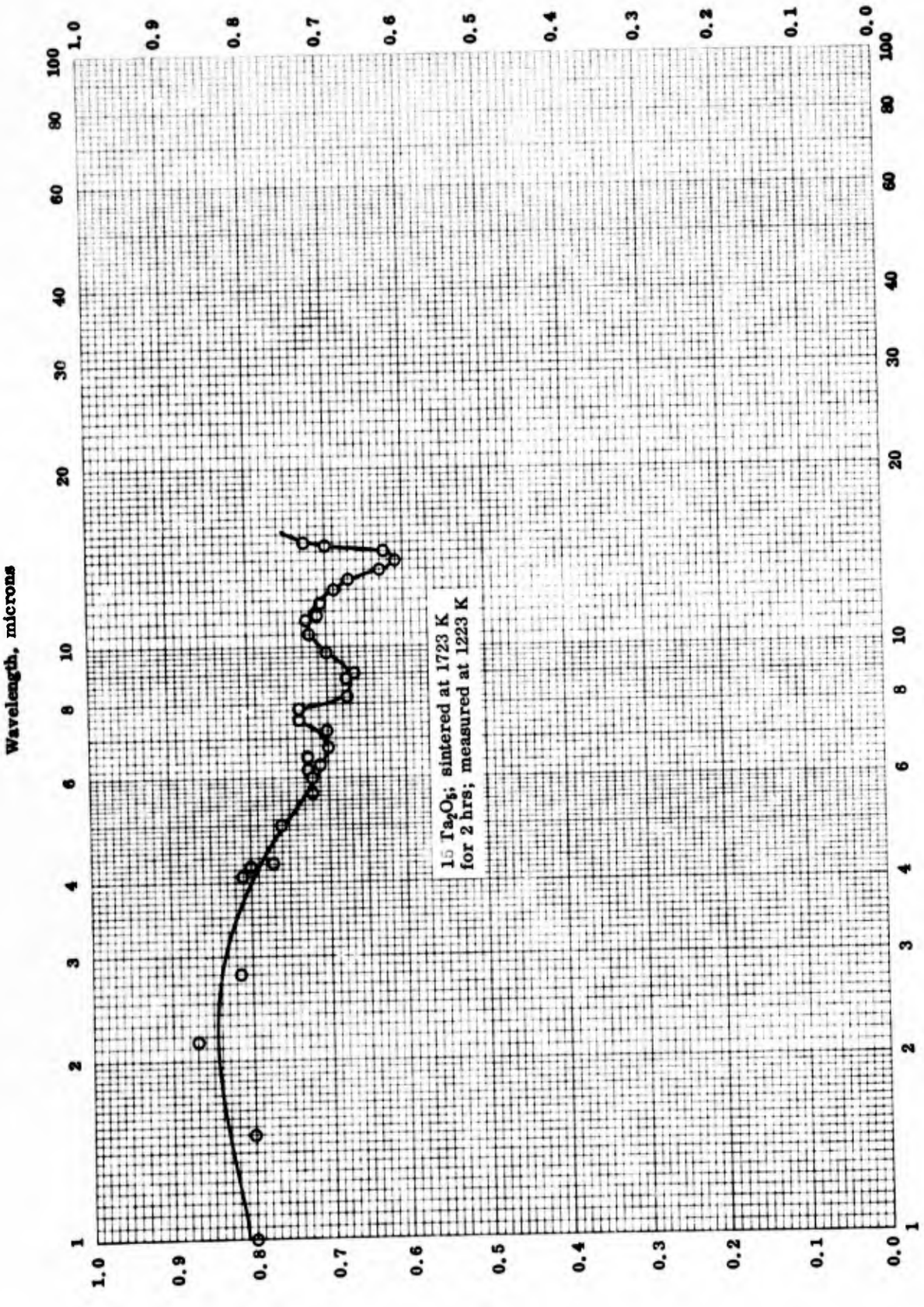


NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

NORMAL TOTAL EMITTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	85 $TaBe_{12}$ and 15 Ta_2O_5; 0.05 in. thickness plate; density 4.02 g cm^{-3}.	Sintered at 1723 K for 2 hrs, measured in argon; calculated from spectral data.

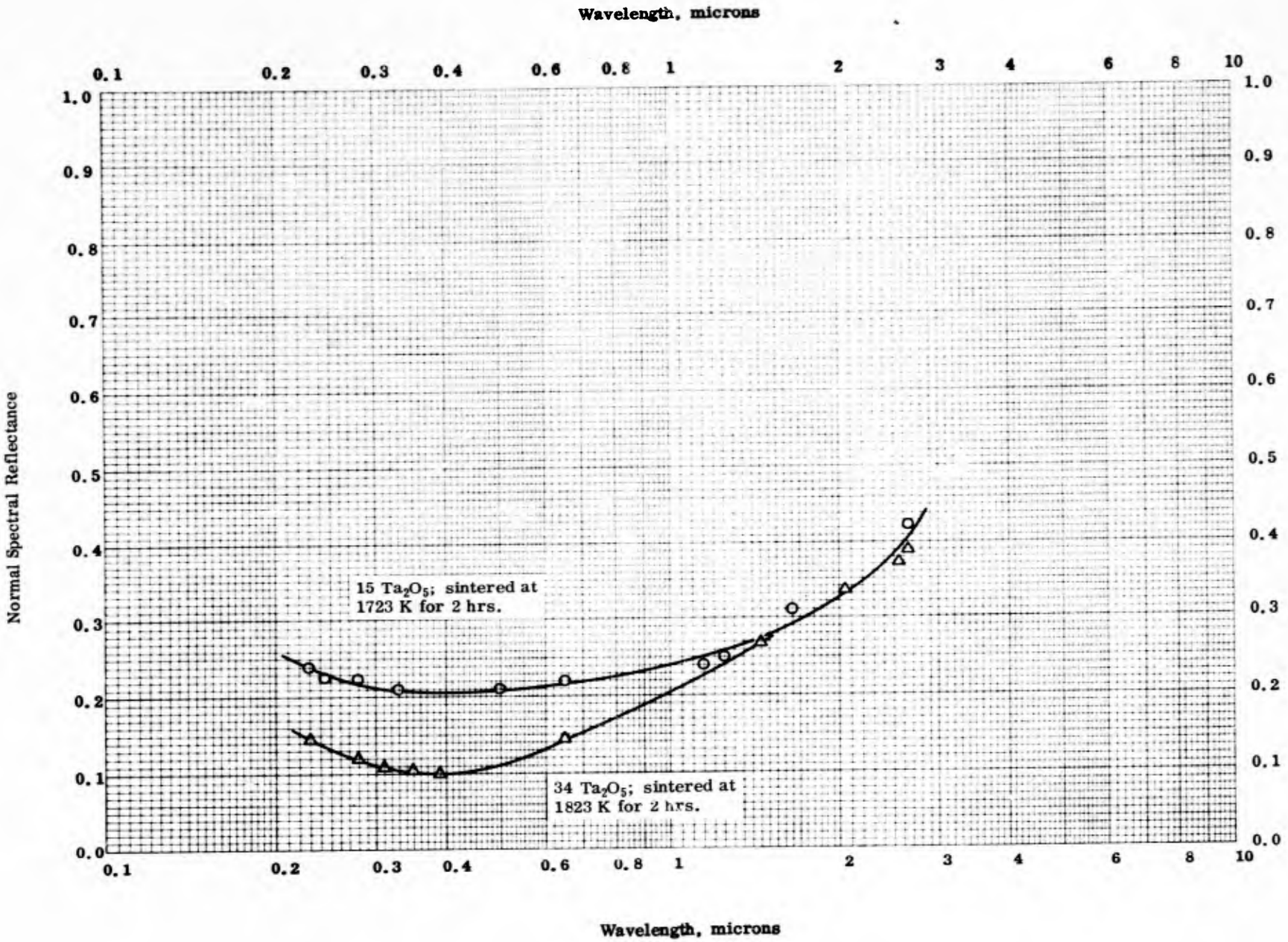


NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

NORMAL SPECTRAL EMITTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	1-15		85 $TaBe_{12}$ and 15 Ta_2O_5; 0.05 in. thickness plate; density 4.02 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon; data taken from a curve.

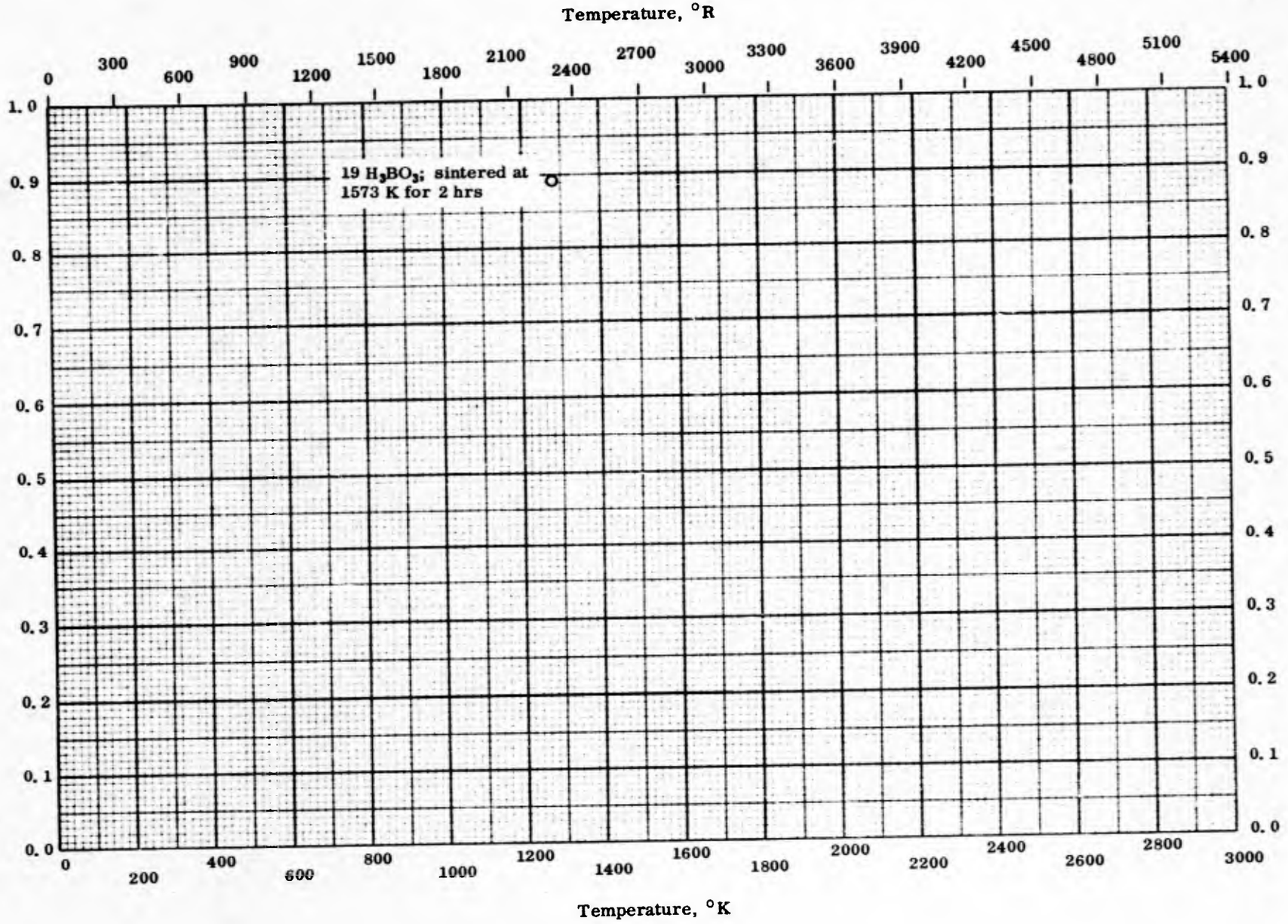


NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

NORMAL SPECTRAL REFLECTANCE -- TANTALUM BERYLLIDE + TANTALUM PENTOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	85 $TaBe_{12}$ and 15 Ta_2O_5; 0.05 in. thickness plate; density 4.02 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
Δ	63-18	298	0.23-2.65	5	66 $TaBe_{12}$ and 34 Ta_2O_5; 0.035 in. thickness plate; density 3.23 g cm^{-3}.	Same as above except sintered at 1823 K for 2 hrs.



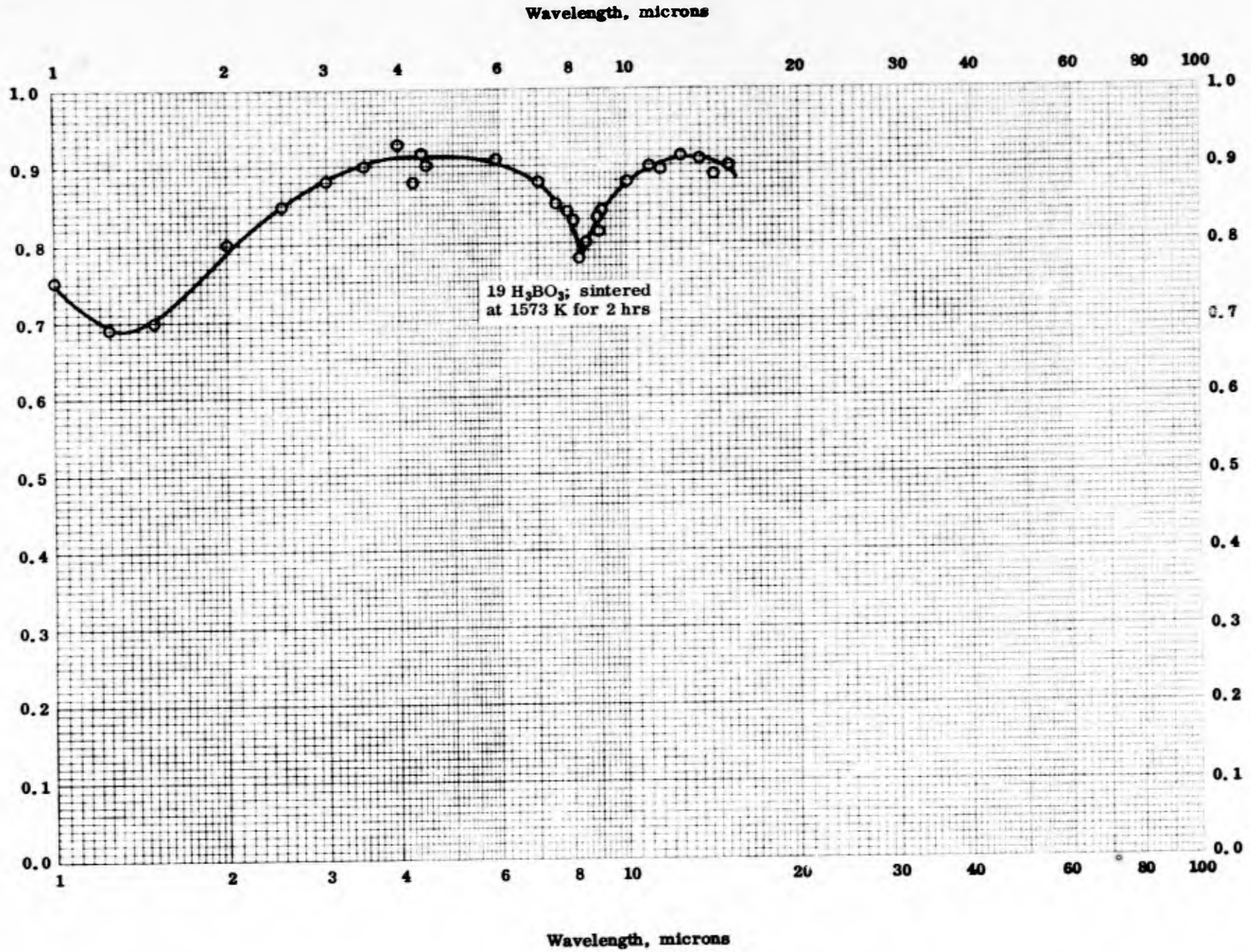
NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + BORACIC ACID

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	±8	81 TiB_2 and 19 H_3BO_3; 0.042 in. thickness plate; density 2.25 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atm.; calculated from spectral data.

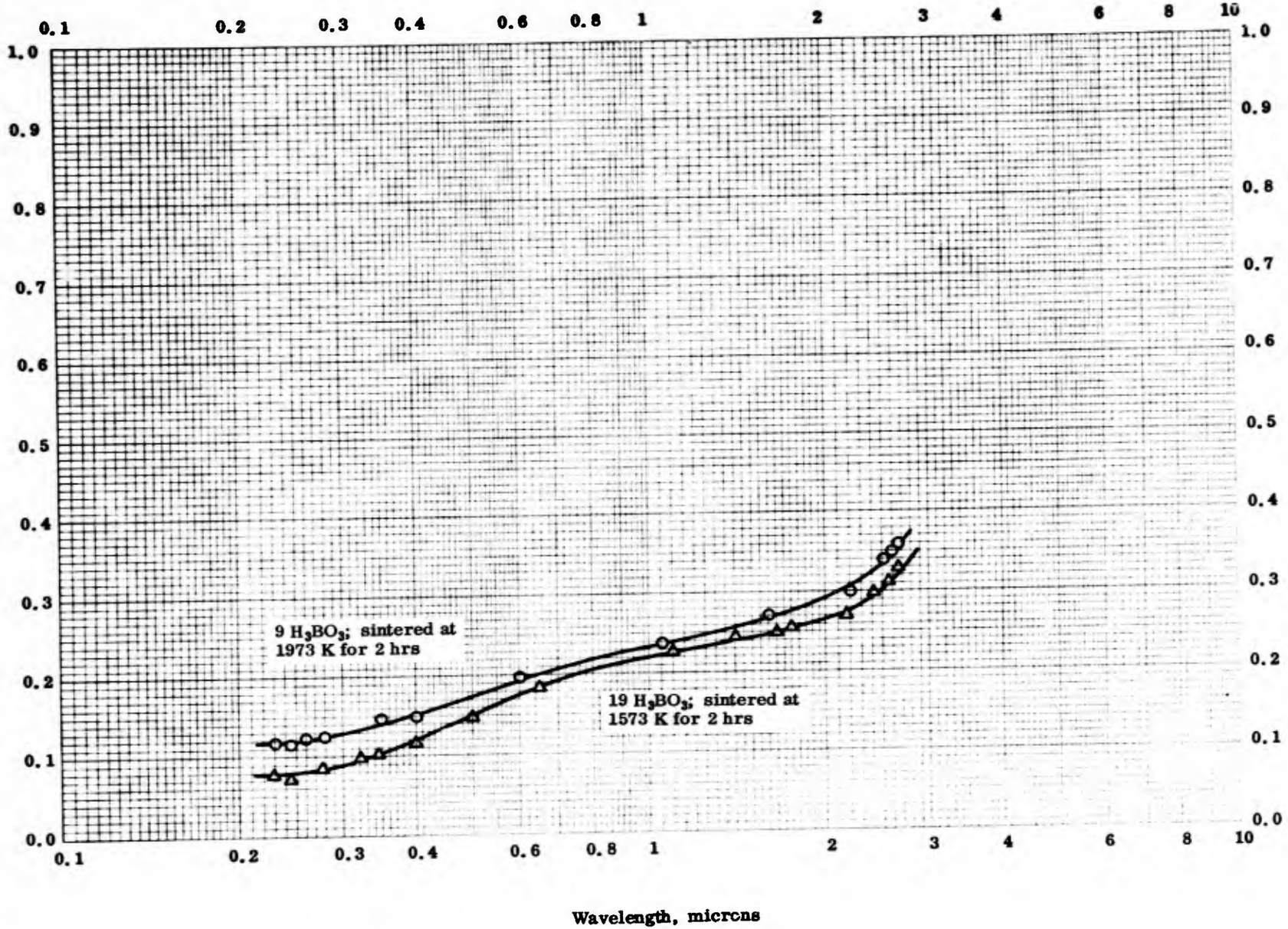


NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + BORACIC ACID

NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	1-15		81 TiB_2 and 19 H_3BO_3; 0.042 in. thickness plate; density 2.25 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atm.; data taken from a curve.



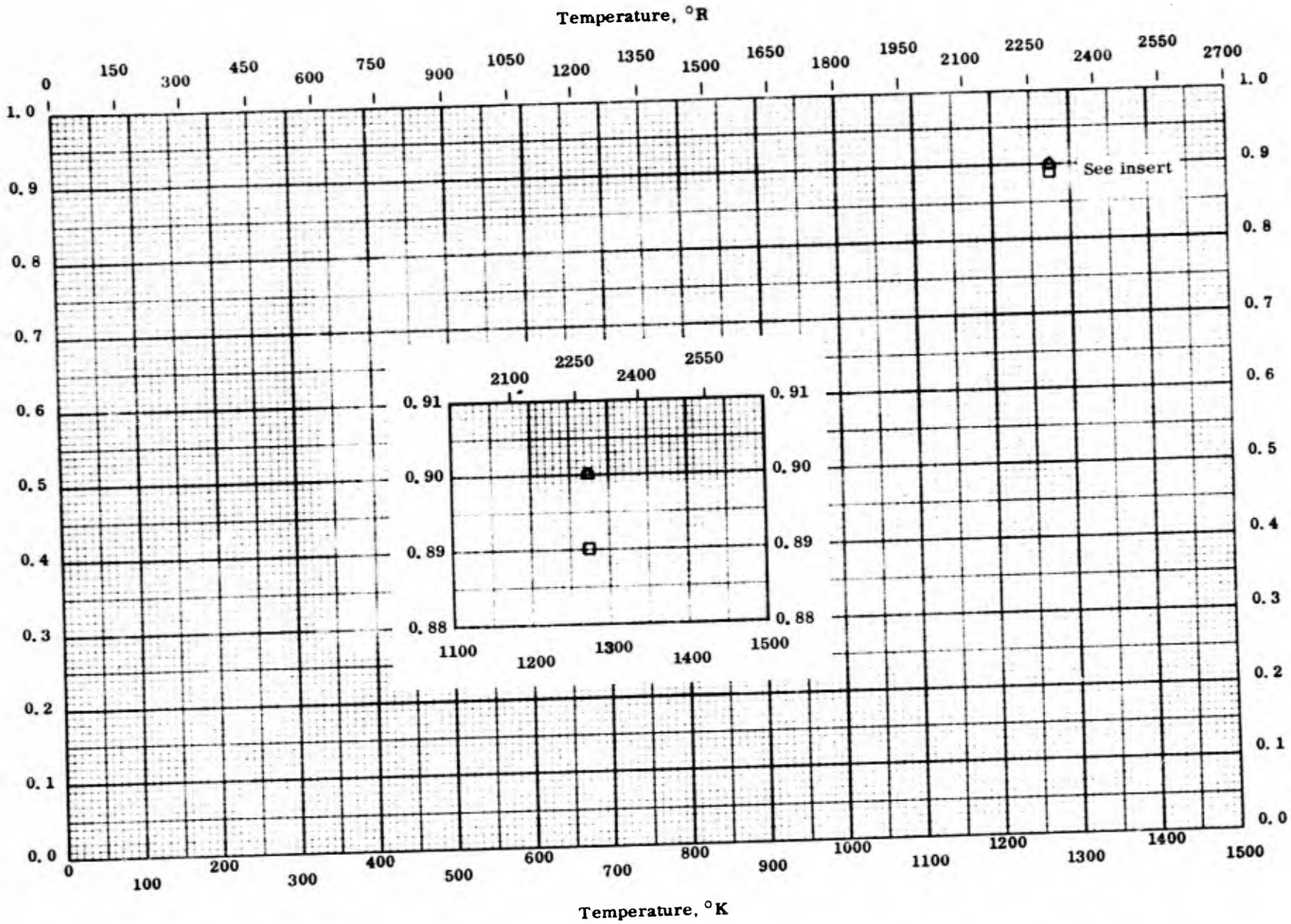
NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + BORACIC ACID

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	91 TiB_2 and 9 H_3BO_3; 0.055 in. thickness plate.	Sintered at 1973 K for 1 hr; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	81 TiB_2 and 19 H_3BO_3; 0.042 in. thickness plate; density 2.25 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

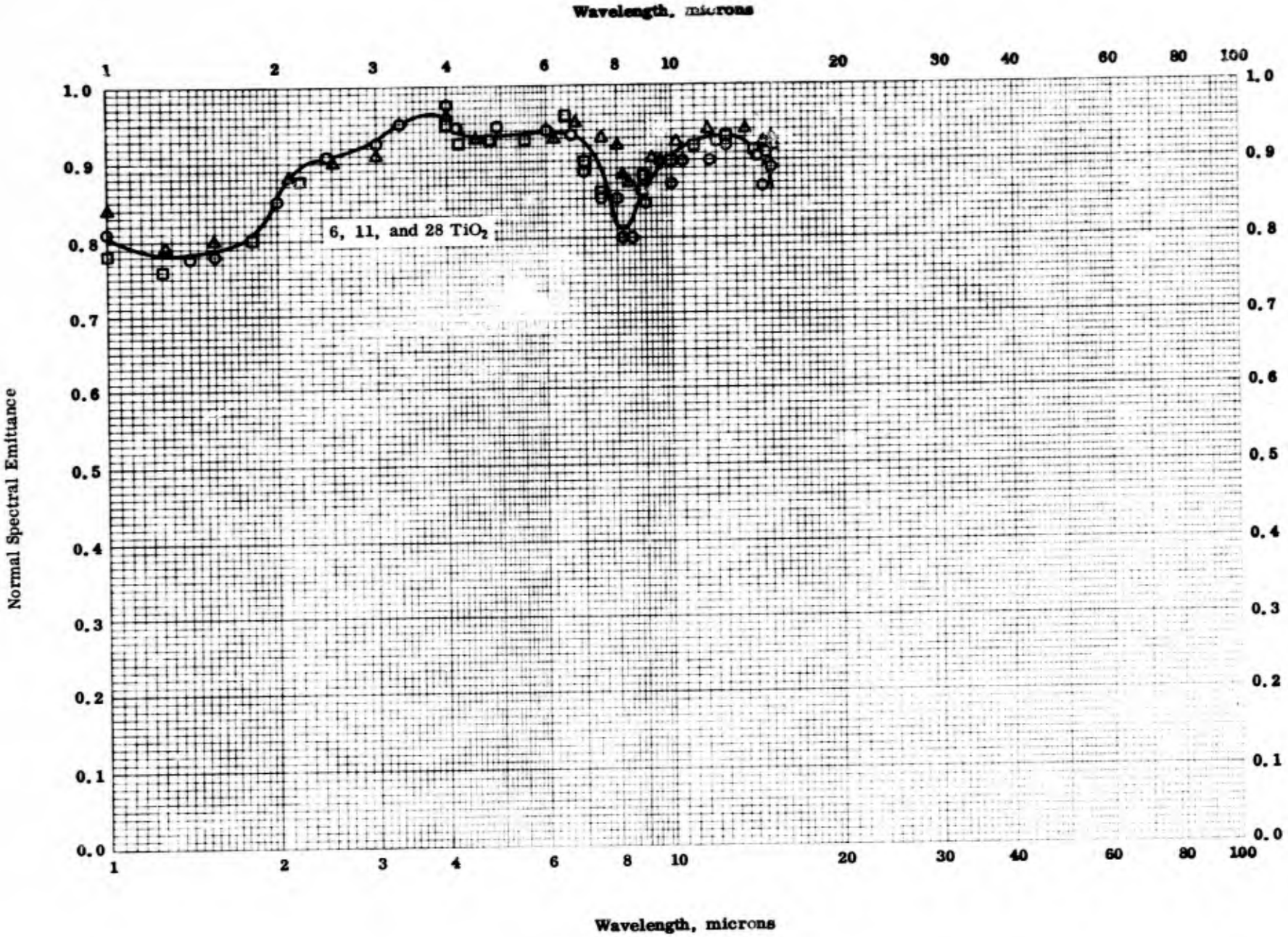


NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	± 8	94 TiB_2 and 6 TiO_2; 0.042 in. thickness plate; density 2.41 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
△	63-18	1273	± 8	89 TiB_2 and 11 TiO_2; 0.075 in. thickness plate; density 2.65 g cm^{-3}.	Same as above except sintered at 1723 K for 2 hrs.
□	63-18	1273	± 8	72 TiB_2 and 28 TiO_2; 0.052 in. thickness plate; density 2.81 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.

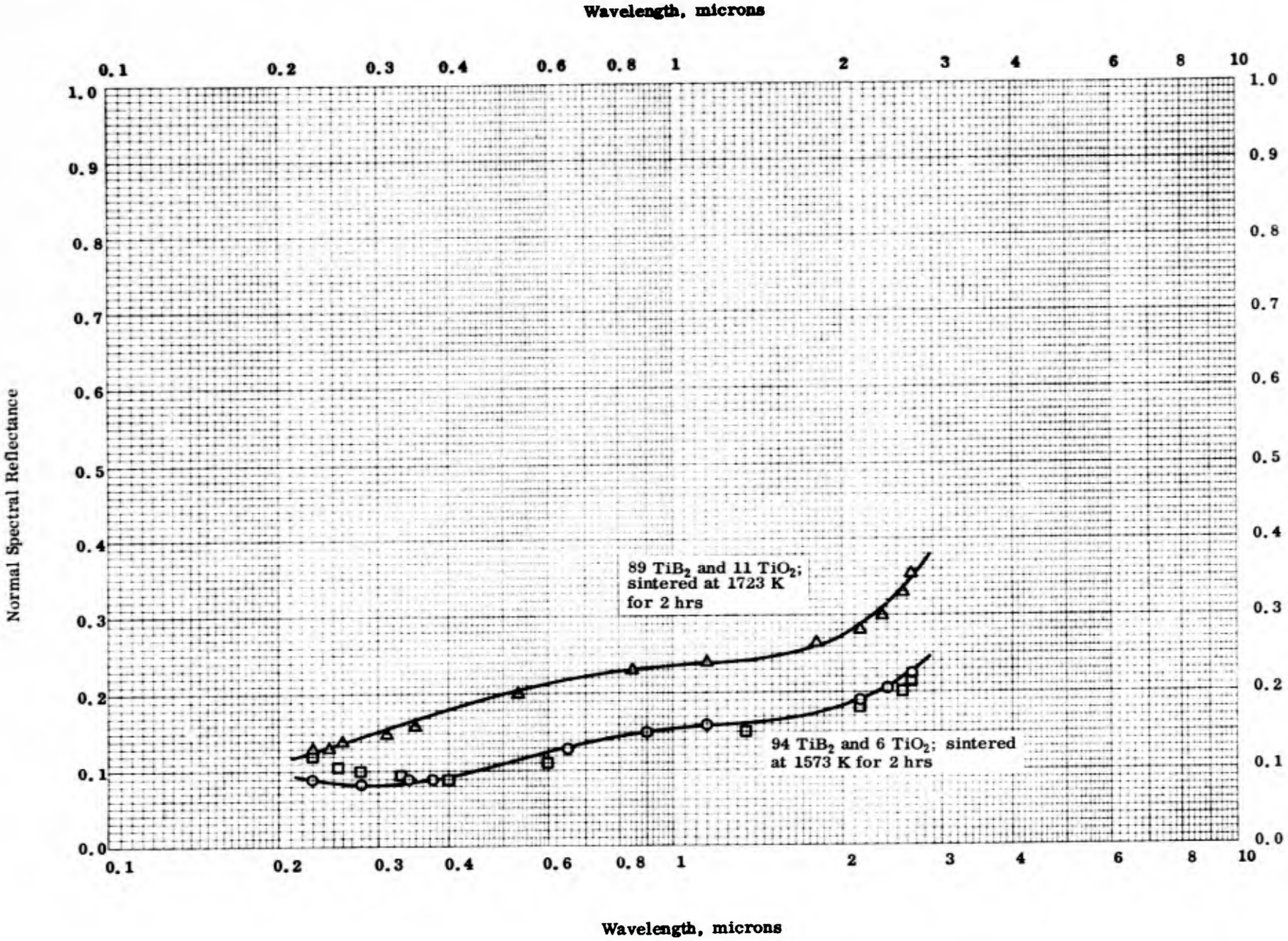


NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	1-15		94 TiE_2 and 6 TiO_2; 0.042 in. thickness plate; density 2.41 g cm^{-3}.	Sintered at 1573 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1273	1-15		89 TiB_2 and 11 TiO_2; 0.075 in. thickness plate; density 2.65 g cm^{-3}.	Same as above except sintered at 1723 K for 2 hrs.
□	63-18	1273	1-15		72 TiB_2 and 28 TiO_2; 0.052 in. thickness plate; density 2.81 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.



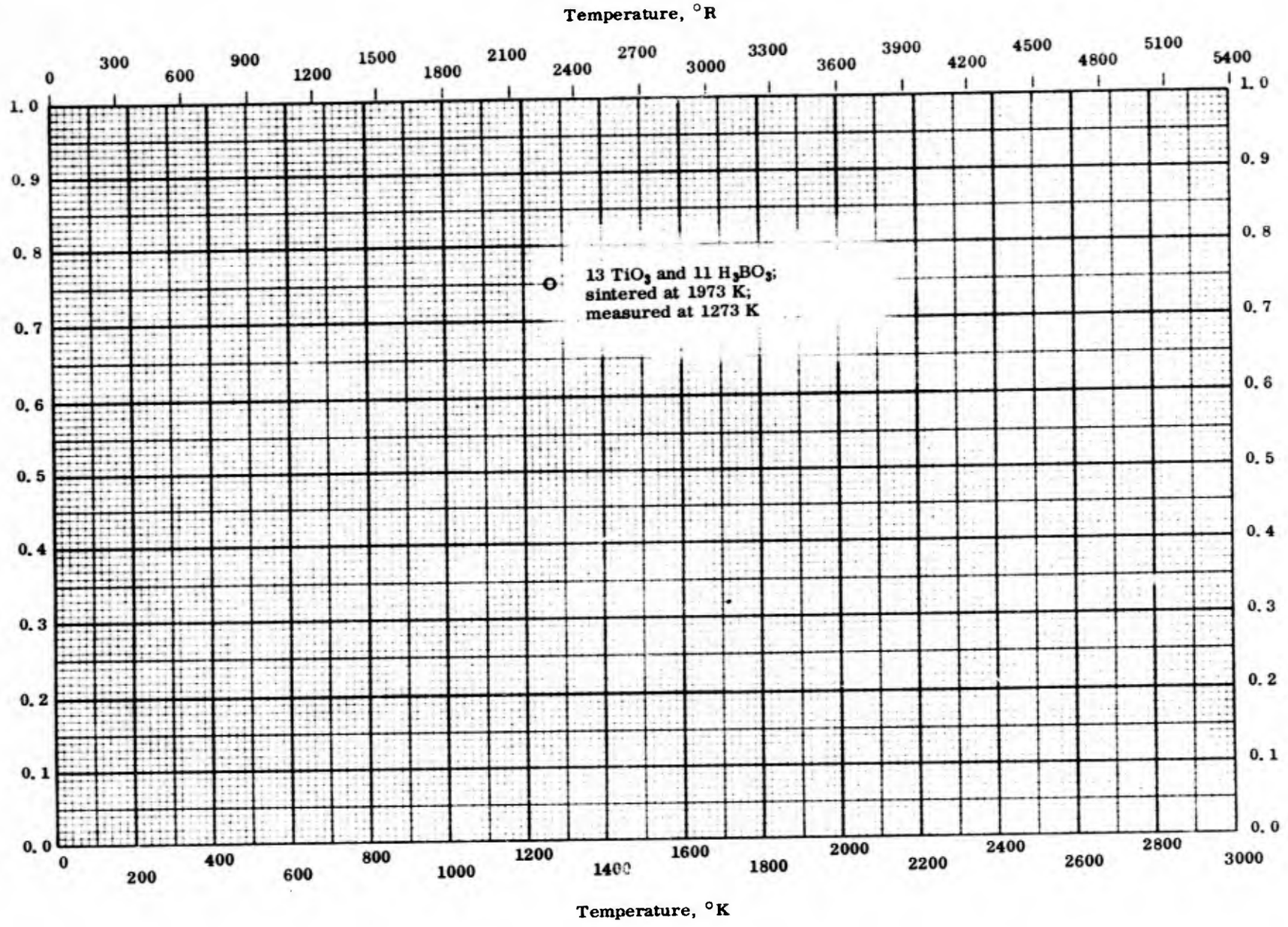
NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	94 TiB_2 and 6 TiO_2; 0.042 in. thickness plate; density 2.41 g cm^{-3}.	Sintered at 1573 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	89 TiB_2 and 11 TiO_2; 0.075 in. thickness plate; density 2.65 g cm^{-3}.	Same as above except sintered at 1723 K for 2 hrs.
□	63-18	298	0.23-2.65	5	72 TiB_2 and 28 TiO_2; 0.052 in. thickness plate; density 2.81 g cm^{-3}.	Same as above except sintered at 1673 K for 2 hrs.

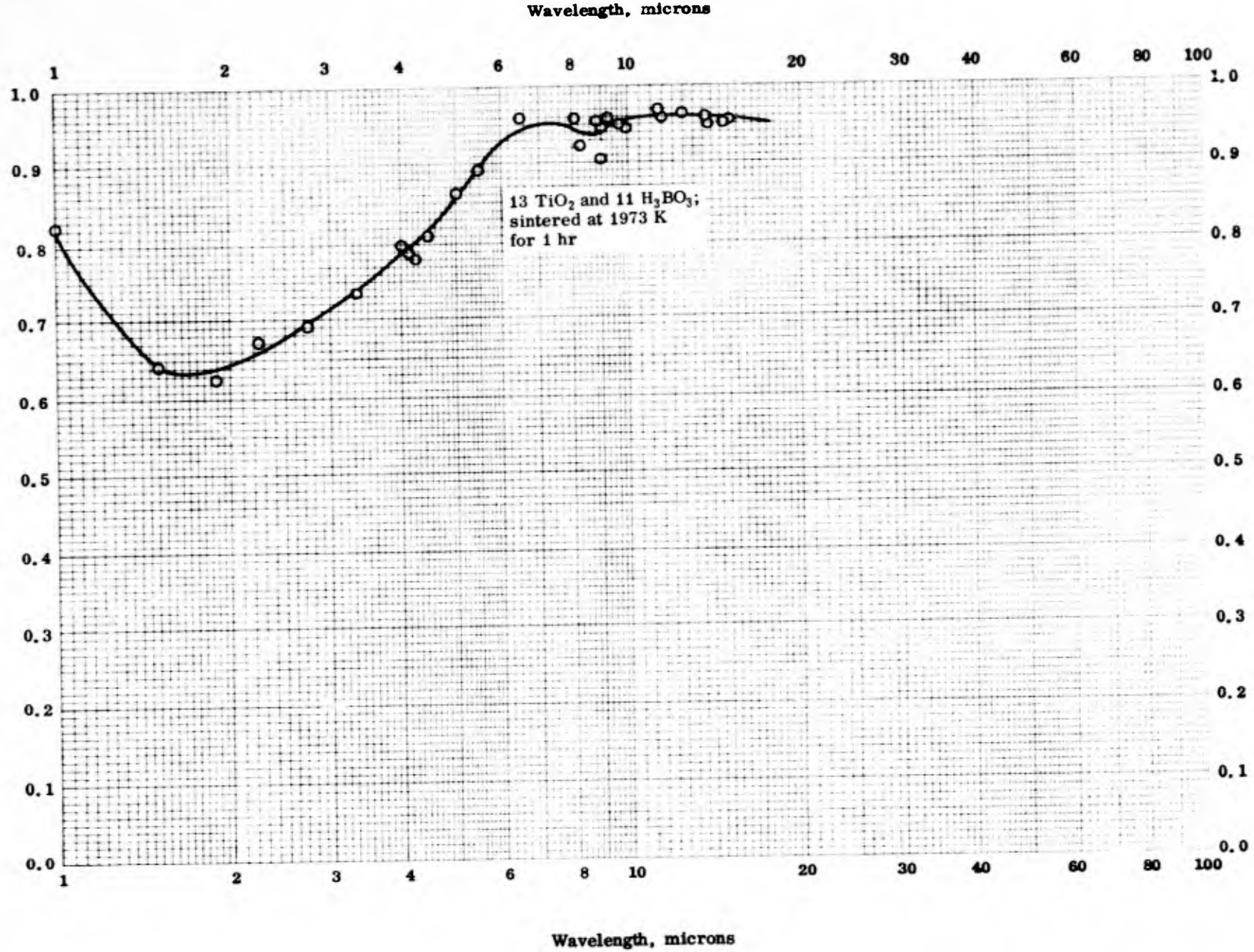


NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

NORMAL TOTAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	± 8	76 TiB_2, 13 TiO_2, and 11 H_3BO_3; 0.067 in. thickness plate; density 2.06 g cm^{-3}.	Sintered at 1973 K for 1 hr; measured in argon atmosphere; calculated from spectral data.

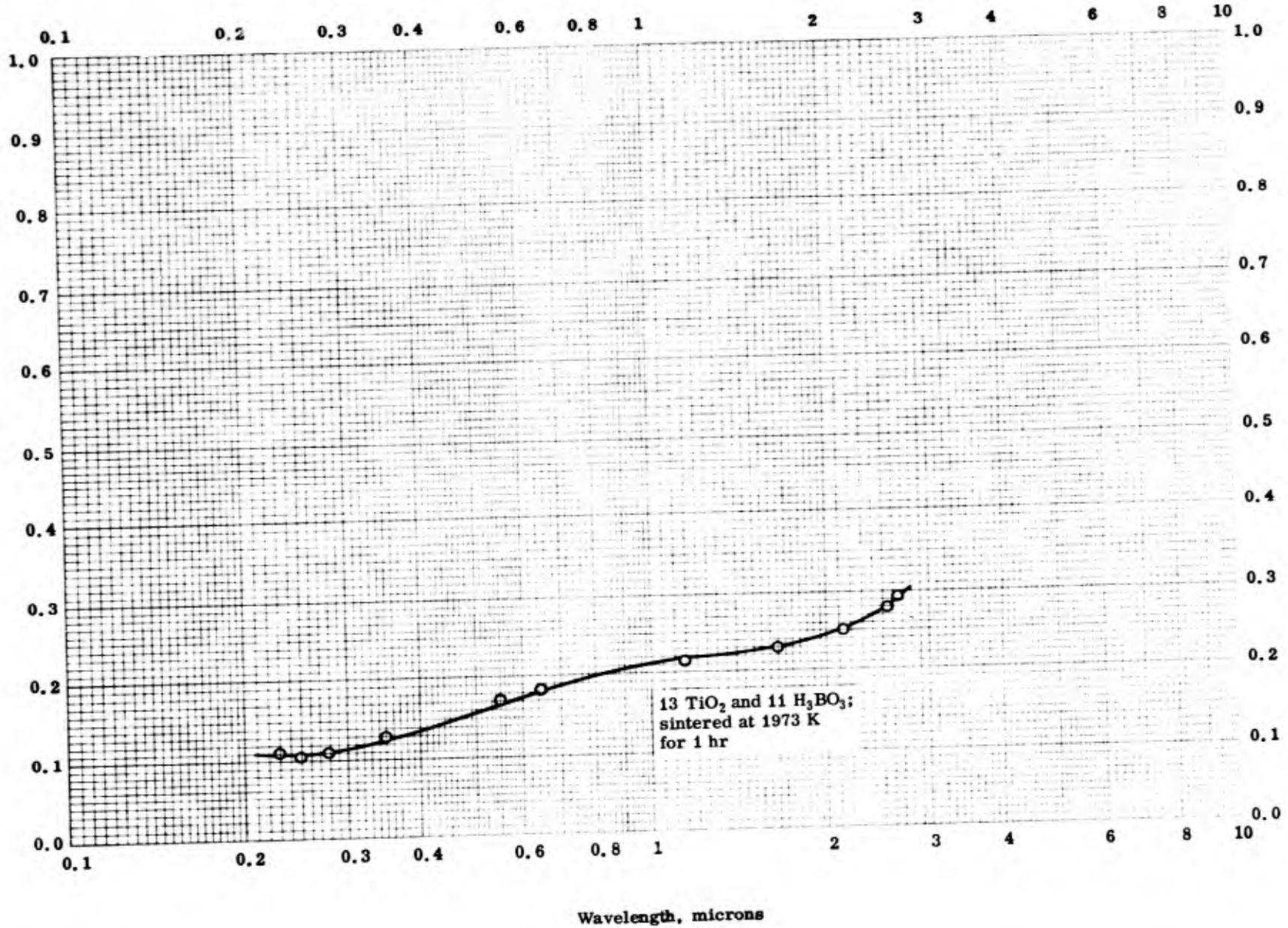


NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

NORMAL SPECTRAL EMITTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	1-15		76 TiBe, 13 TiO_2, and 11 H_3BO_3; 0.067 in. thickness plate; density 2.06 g cm^{-3}.	Sintered at 1973 K for 1 hr; measured in argon atmosphere; data taken from a curve.

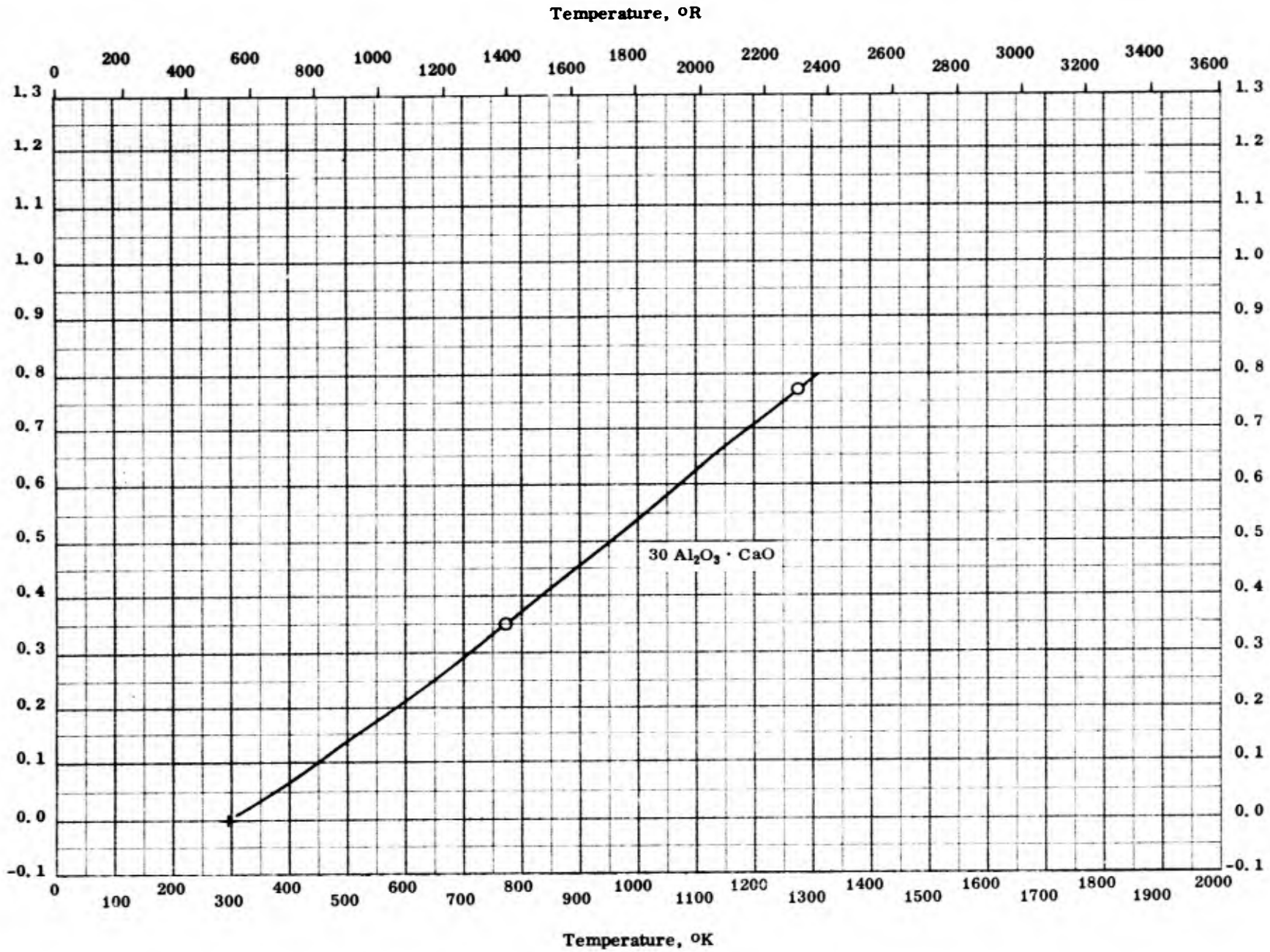


NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

NORMAL SPECTRAL REFLECTANCE -- TITANIUM DIBORIDE + TITANIUM DIOXIDE + BORACIC ACID

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	76 TiB_2, 13 TiO_2, and 11 H_3BO_3; 20.067 in. thickness plate; density 2.06 g cm^{-3}.	Sintered at 1973 K for 1 hr; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.



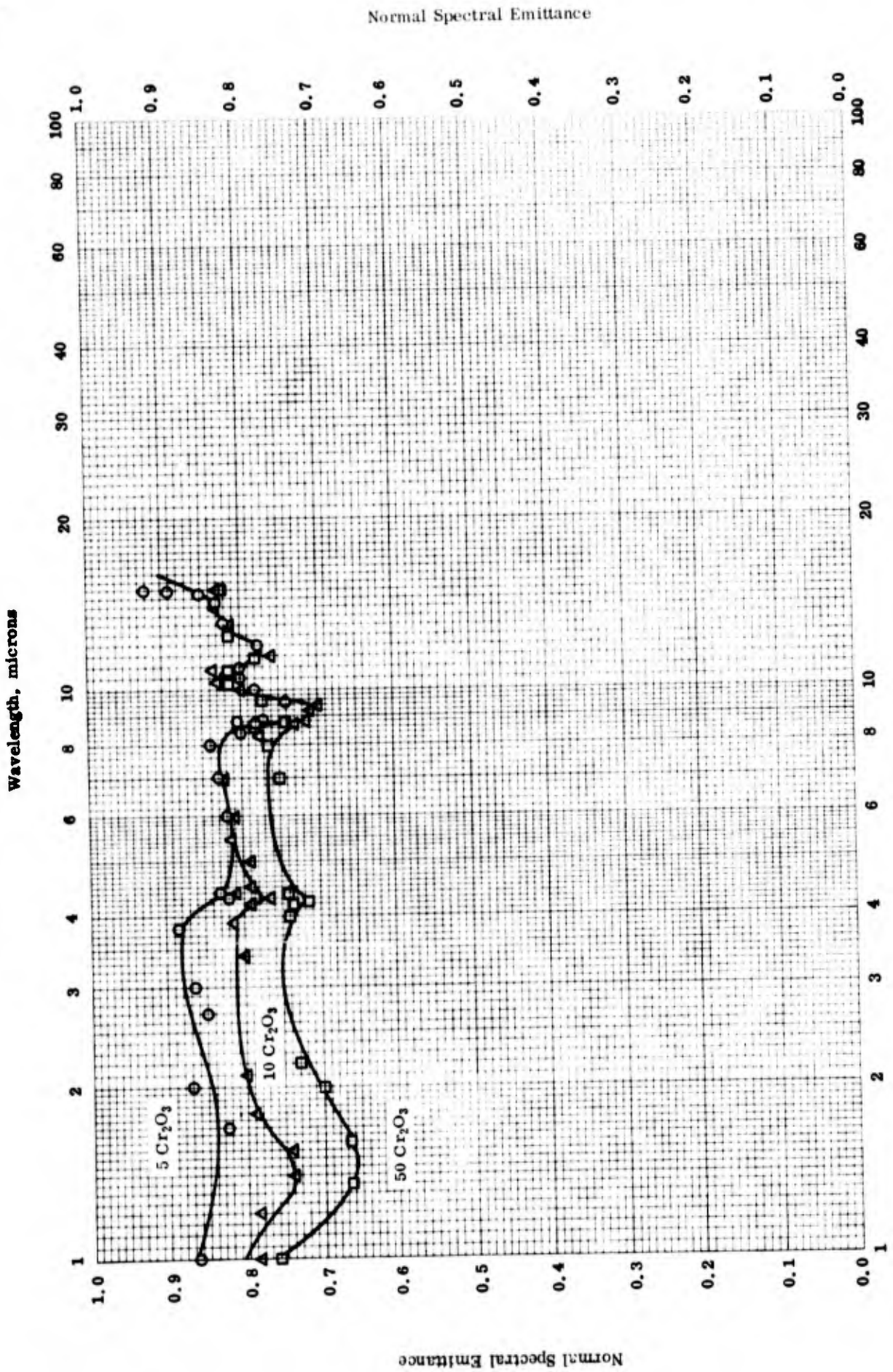
TPRC

THERMAL LINEAR EXPANSION — MOLYBDENUM DISILICIDE + CALCIUM ALUMINATE

THERMAL LINEAR EXPANSION -- MOLYBDENUM DISILICIDE + CALCIUM ALUMINATE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	52-8	295-1273		70 $MoSi_2$ and 30 $Al_2O_3 \cdot CaO$; porosity 5 - 7%.	Pressed $MoSi_2$ and $Al_2O_3 \cdot CaO$ powder mixture at 15 to 60 tsi, pre-sintered at 900 - 1200 C, machined, ground, and then fired at 1500 C for 45 min in cracked ammonia.

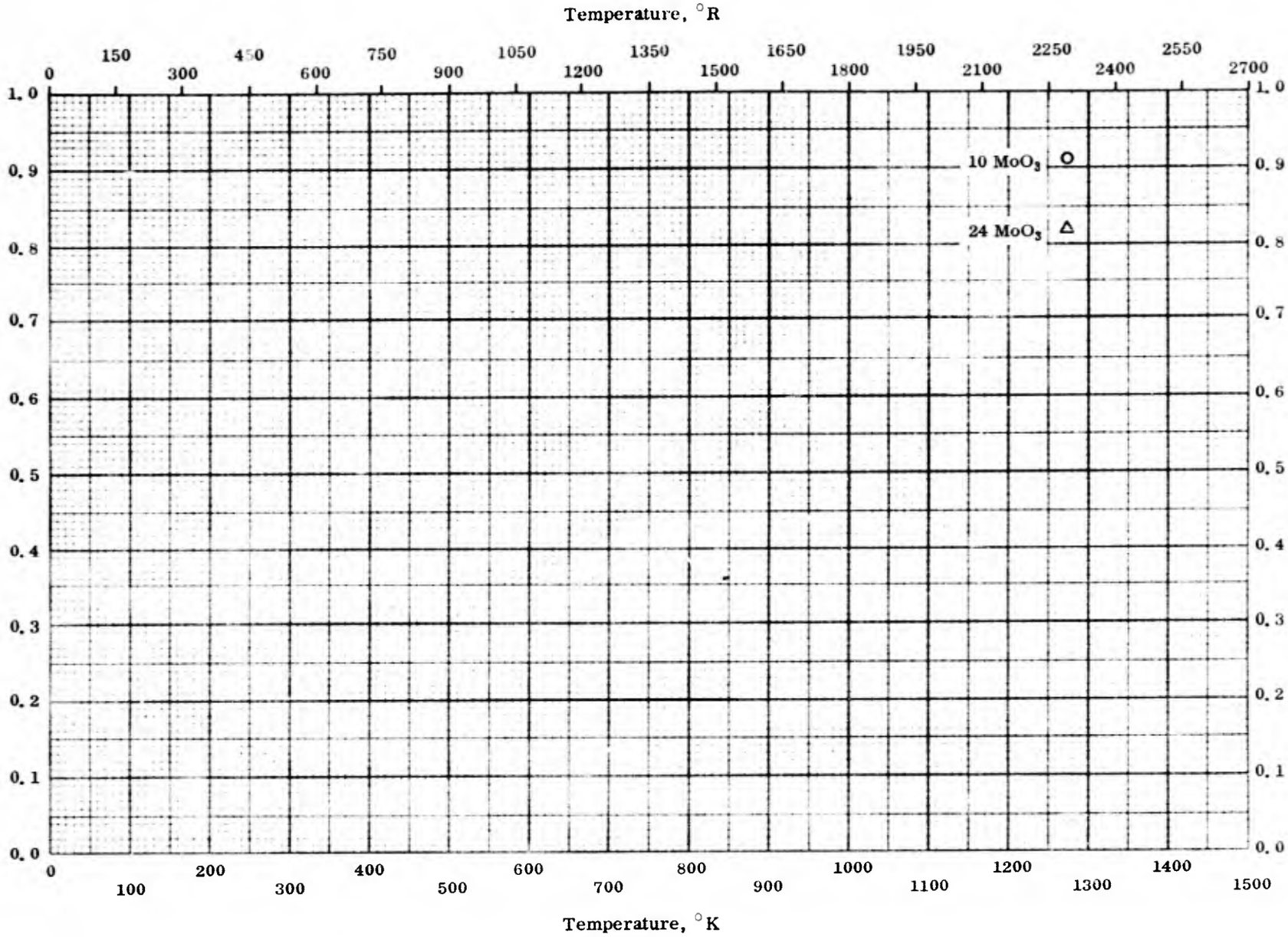


NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + CHROMIUM SESQUIOXIDE

NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + CHROMIUM SESQUIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range μ	Rept. Error%	Sample Specifications	Remarks
○	62-35	1273	1-15	8.9	95 $MoSi_2$ and 5 Cr_2O_3; 0.067 in. thickness plate.	Sintered at 1723 K for 1 hr; measured in air; data taken from a curve.
△	62-35	1273	1-15	8.9	90 $MoSi_2$ and 10 Cr_2O_3; 0.047 in. thickness plate.	Same as above.
□	62-35	1273	1-15	8.9	50 $MoSi_2$ and 50 Cr_2O_3; 0.046 in. thickness plate.	Same as above.



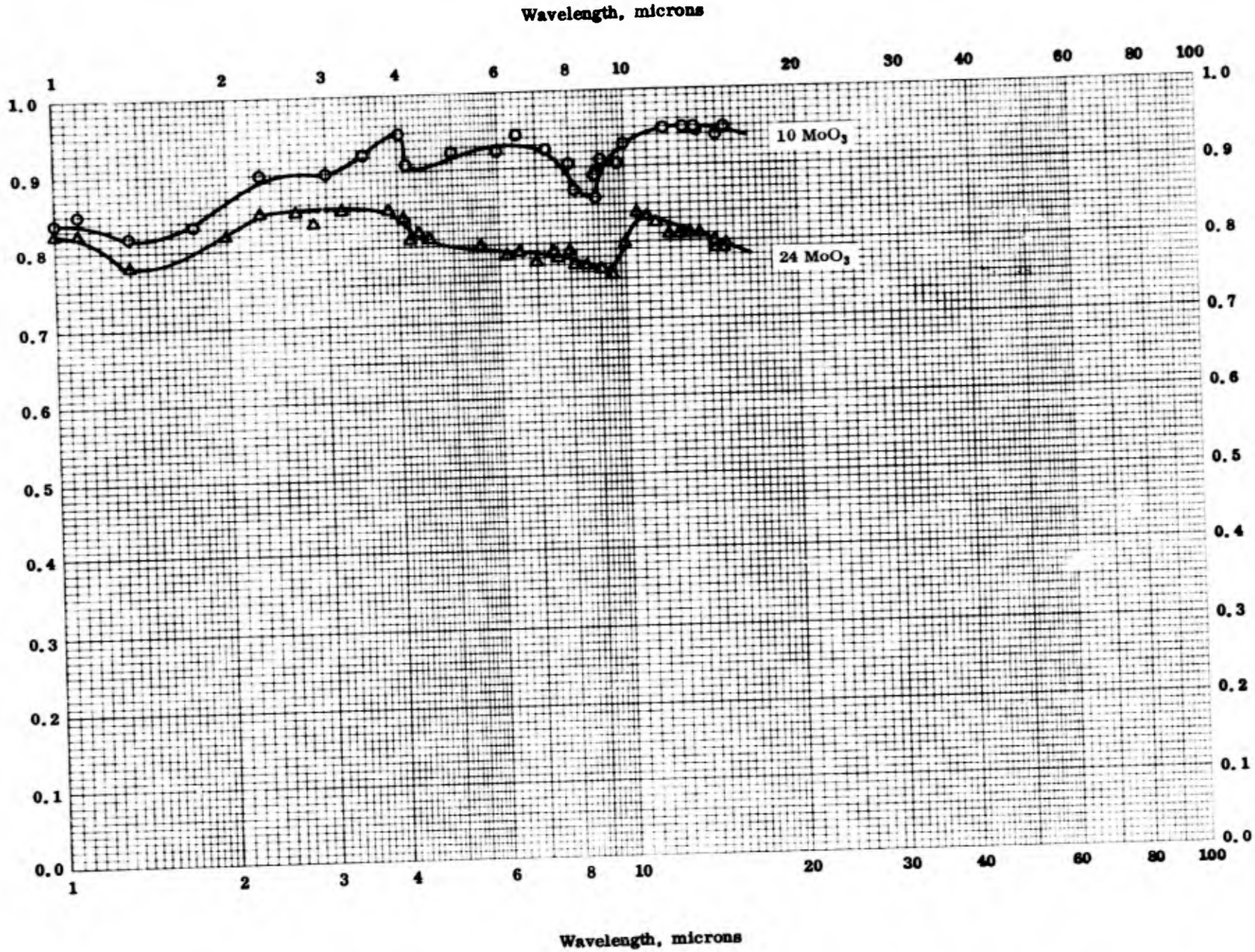
TPRC

NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1273	±8	90 $MoSi_2$ and 10 MoO_3; 0.058 in. thickness plate; density 3.03 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atm; calculated from spectral data.
Δ	63-18	1273	±8	76 $MoSi_2$ and 24 MoO_3; 0.051 in. thickness plate; density 4.78 g cm^{-3}.	Same as above.



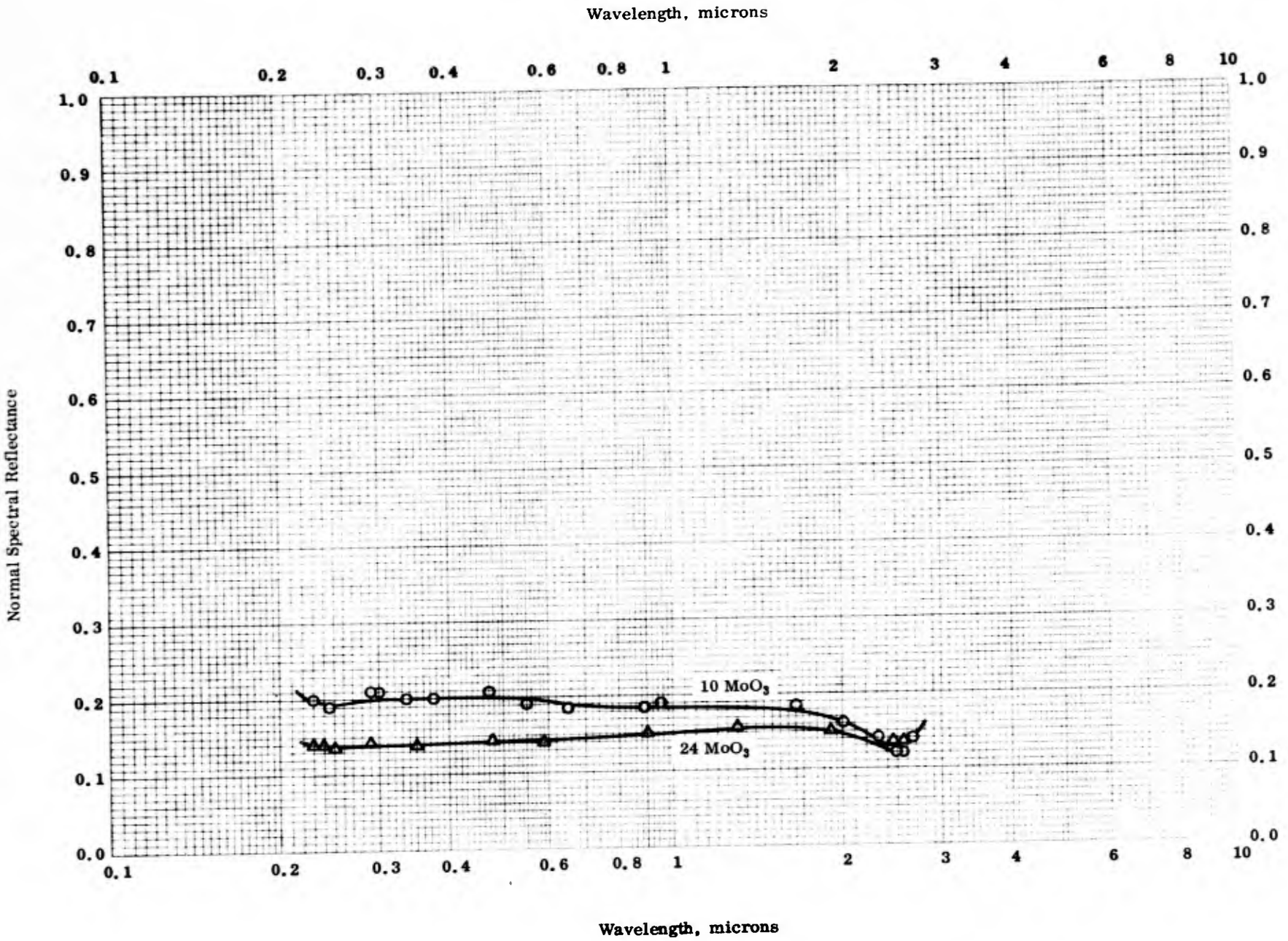
NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	1273	1-15		90 $MoSi_2$ and 10 MoO_3; 0.058 in. thickness plate; density 3.03 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atm; data taken from a curve.
Δ	63-18	1273	1-15		76 $MoSi_2$ and 24 MoO_3; 0.051 in. thickness plate; density 4.78 g cm^{-3}.	Same as above.



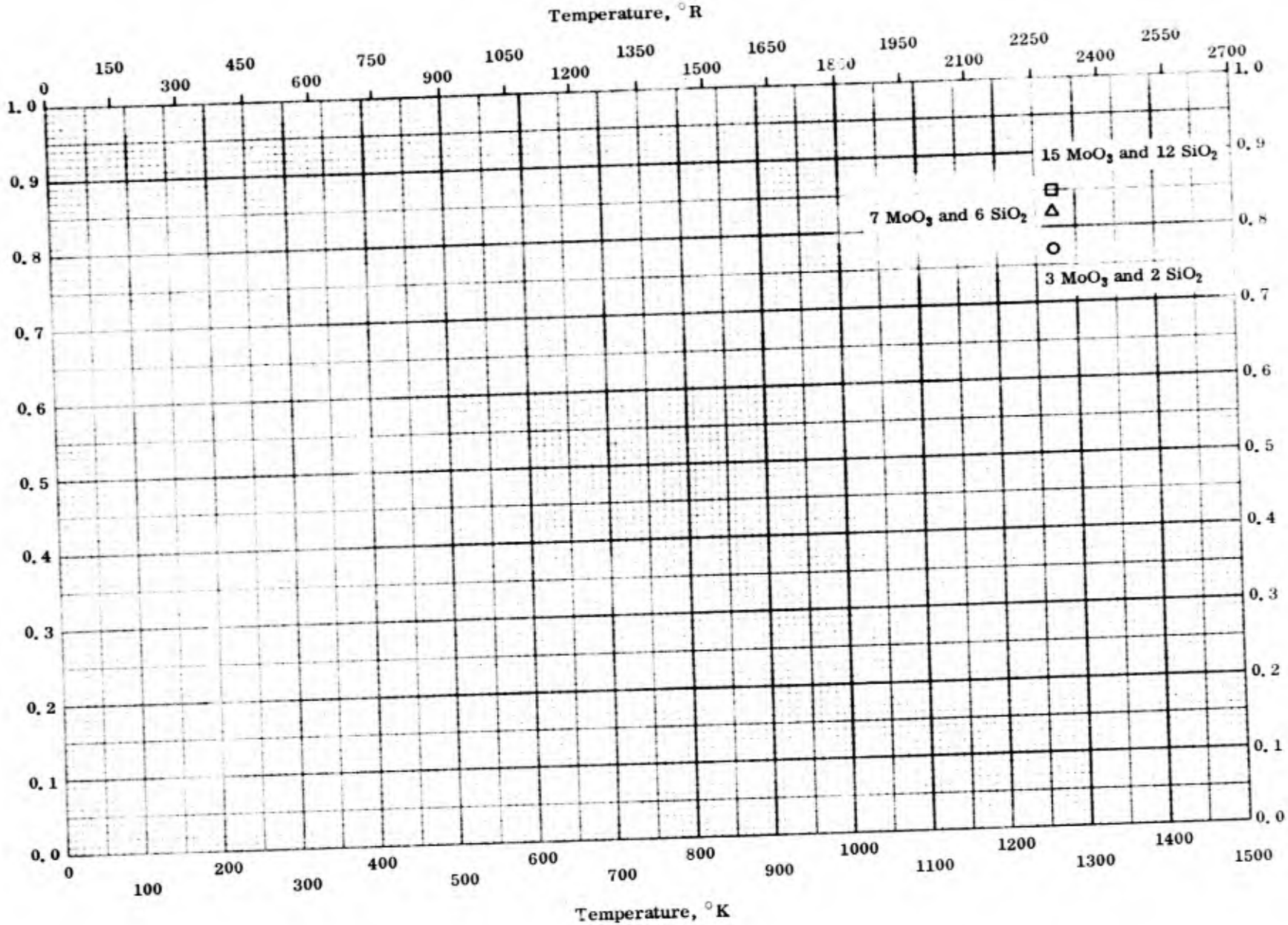
NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range μ	Rept. Error%	Sample Specifications	Remarks
O	63-18	298	0.23-2.65	5	90 $MoSi_2$ and 10 MoO_3; 0.058 in. thickness plate; density 3.03 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
Δ	63-18	298	0.23-2.65	5	76 $MoSi_2$ and 24 MoO_3; 0.051 in. thickness plate; density 4.78 g cm^{-3}.	Same as above.



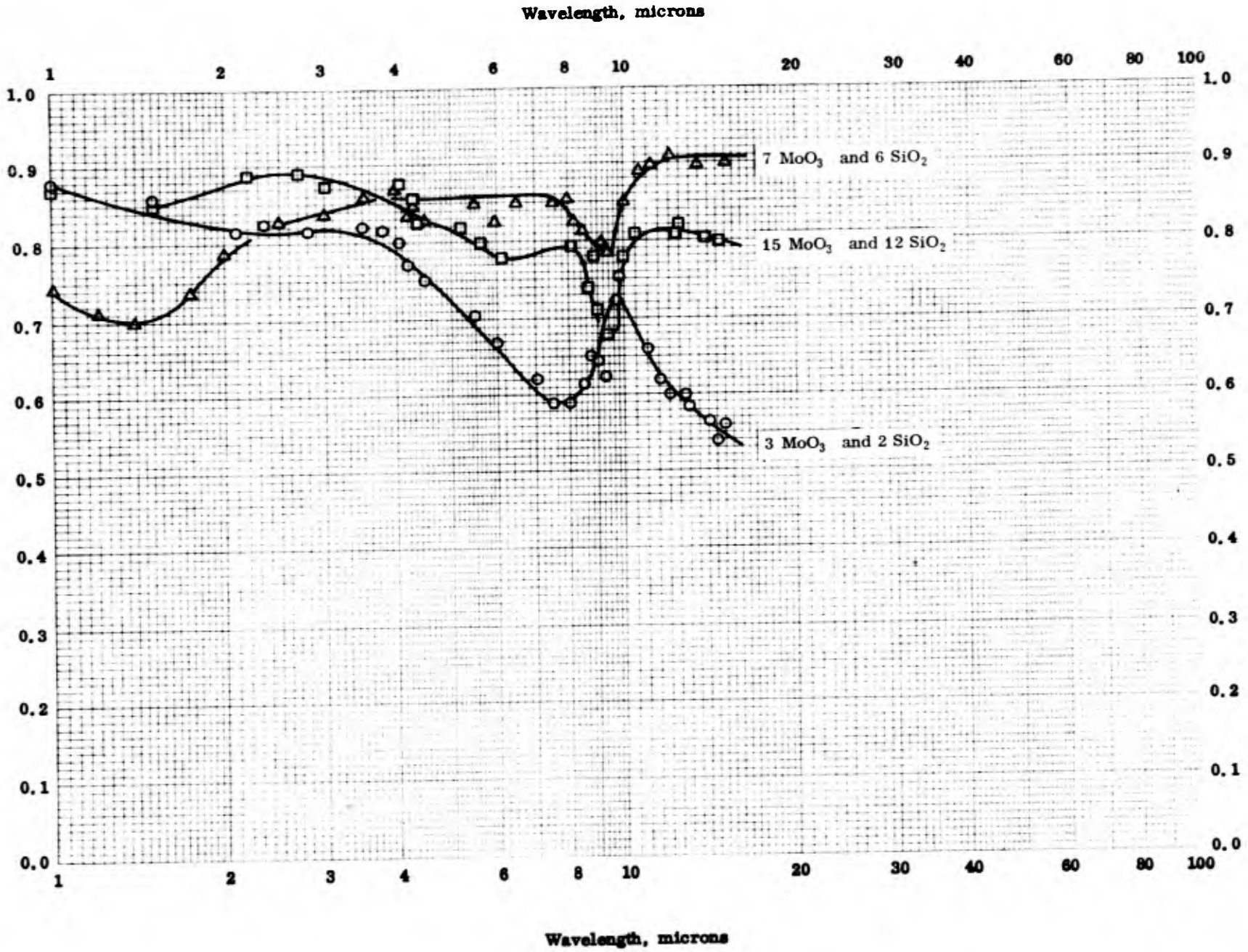
NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	±8	95 $MoSi_2$, 3 MoO_3, and 2 SiO_2; 0.06 in. thickness plate; density 4.68 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atm; calculated from spectral data.
△	63-18	1273	±8	87 $MoSi_2$, 7 MoO_3, and 6 SiO_2; 0.06 in. thickness plate; density 4.72 g cm^{-3}.	Same as above.
□	63-18	1273	±8	73 $MoSi_2$, 15 MoO_3, and 12 SiO_2; 0.045 in. thickness plate; density 3.79 g cm^{-3}.	Same as above.

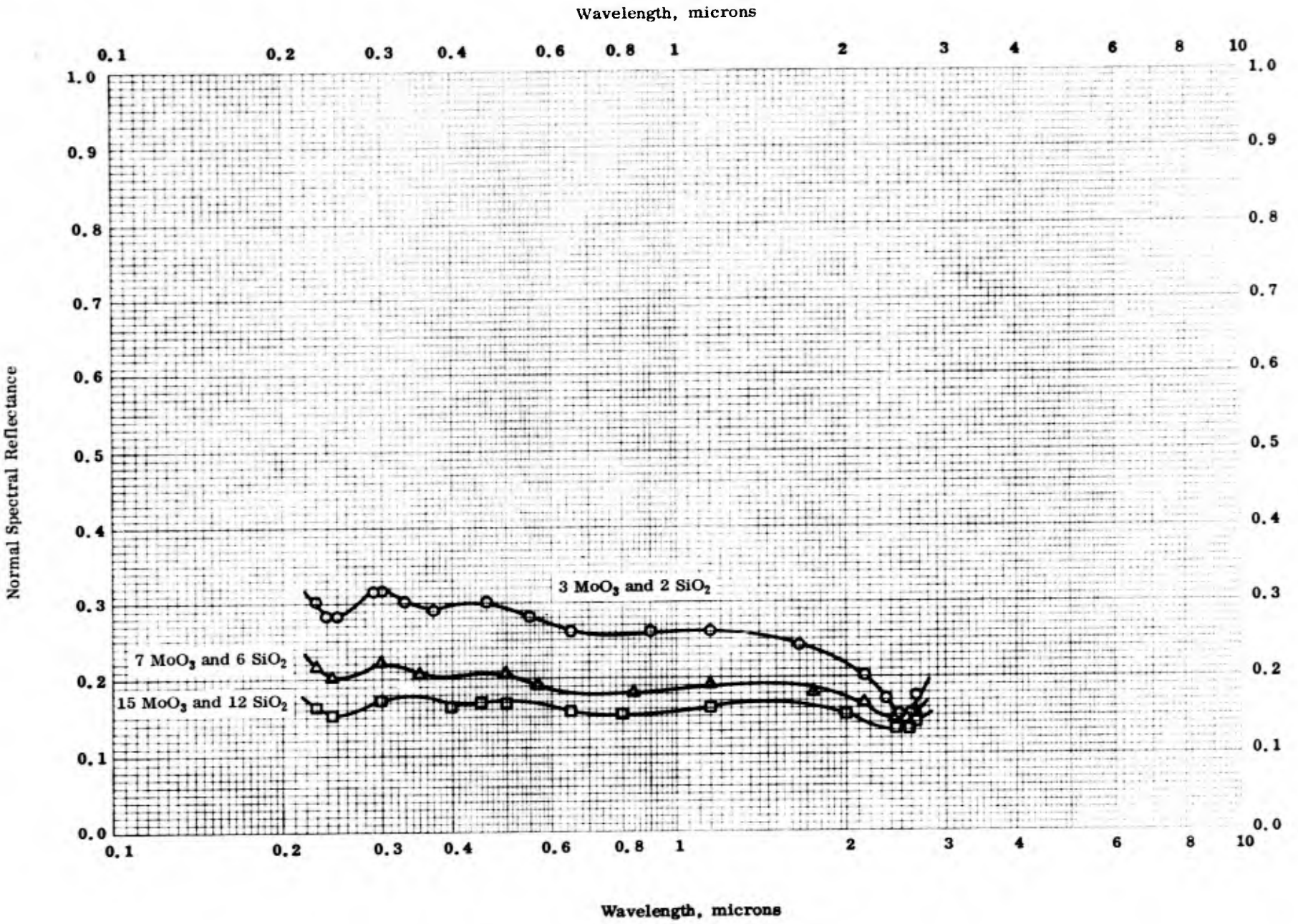


NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	1-15		95 $MoSi_2$, 3 MoO_3, and 2 SiO_2; 0.06 in. thickness plate; density 4.68 g cm^{-3}.	Sintered at 1723 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1273	1-15		87 $MoSi_2$, 7 MoO_3, and 6 SiO_2; 0.06 in. thickness plate; density 4.72 g cm^{-3}	Same as above.
□	63-18	1273	1-15		73 $MoSi_2$, 15 MoO_3, and 12 SiO_2; 0.045 in. thickness plate; density 3.79 g cm^{-3}.	Same as above.

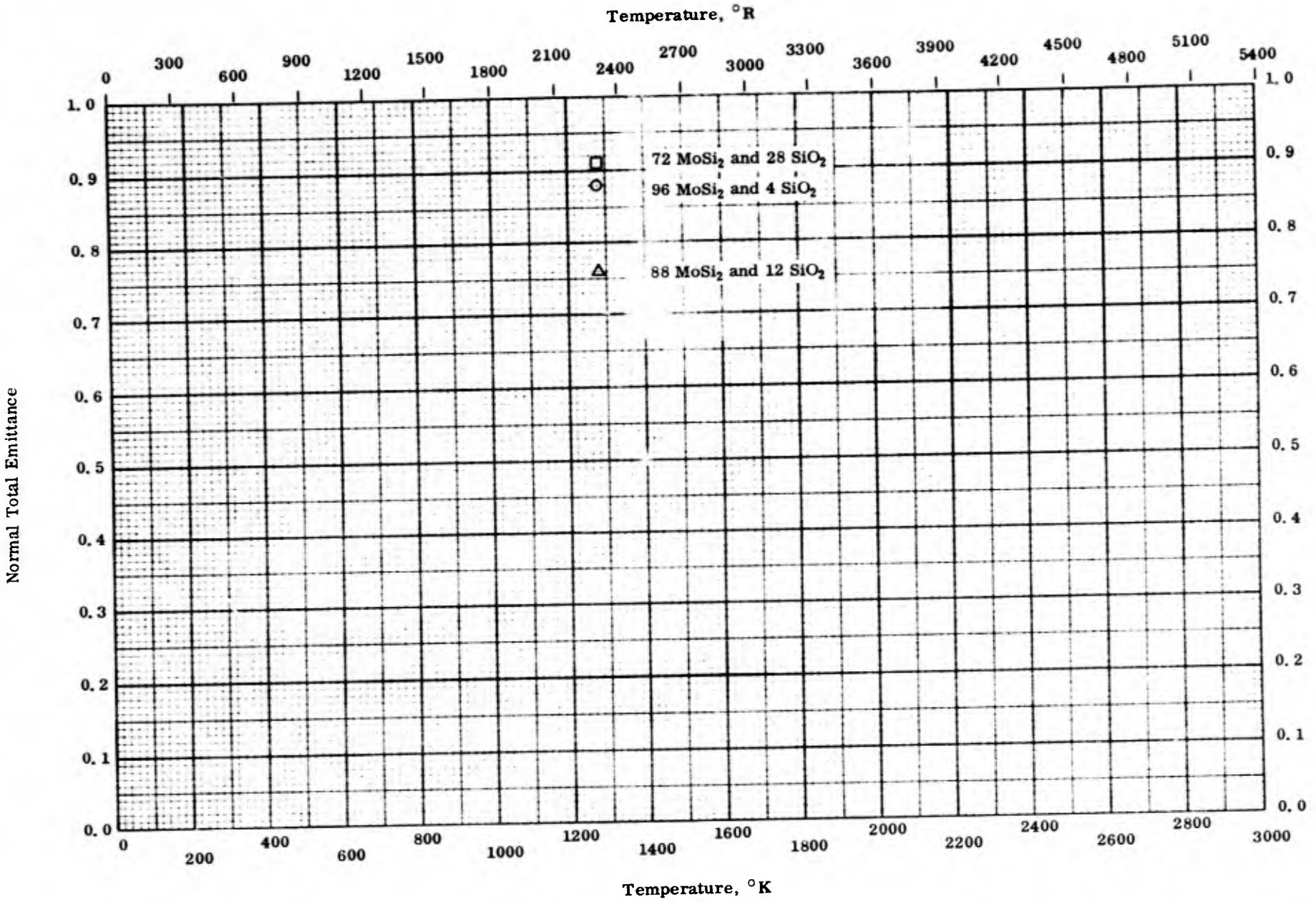


NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + MOLYBDENUM TRIOXIDE + SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range μ	Rept. Error%	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	95 $MoSi_2$, 3 MoO_3, and 2 SiO_2; 0.06 in. thickness plate; density 4.68 g cm^{-3}.	Sintered at 1723 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	87 $MoSi_2$, 7 MoO_3, and 6 SiO_2; 0.06 in. thickness plate; density 4.72 g cm^{-3}.	Same as above.
□	63-18	298	0.23-2.65	5	73 $MoSi_2$, 15 MoO_3, and 12 SiO_2; 0.045 in. thickness plate; density 3.79 g cm^{-3}.	Same as above.

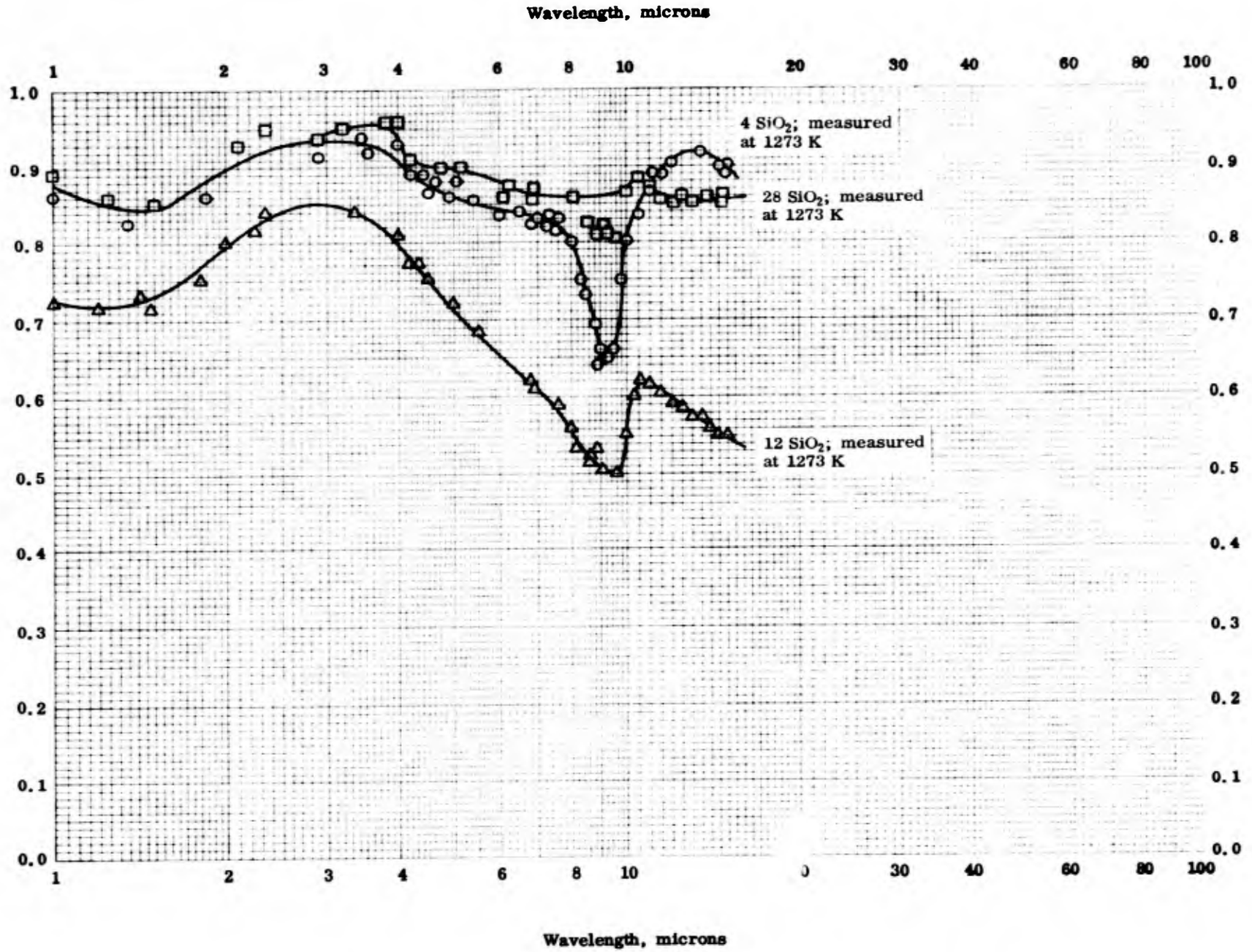


NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE + SILICON DIOXIDE

NORMAL TOTAL EMITTANCE -- MOLYBDENUM DISILICIDE +SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	± 8	96 $MoSi_2$ and 4 SiO_2; 0.05 in. thickness plate; density 4.34 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon; calculated from spectral data.
△	63-18	1273	± 8	88 $MoSi_2$ and 12 SiO_2; 0.065 in. thickness plate; density 4.25 g cm^{-3}.	Same as above.
□	63-18	1273	± 8	72 $MoSi_2$ and 28 SiO_2; 0.051 in. thickness plate; density 2.83 g cm^{-3}.	Same as above.

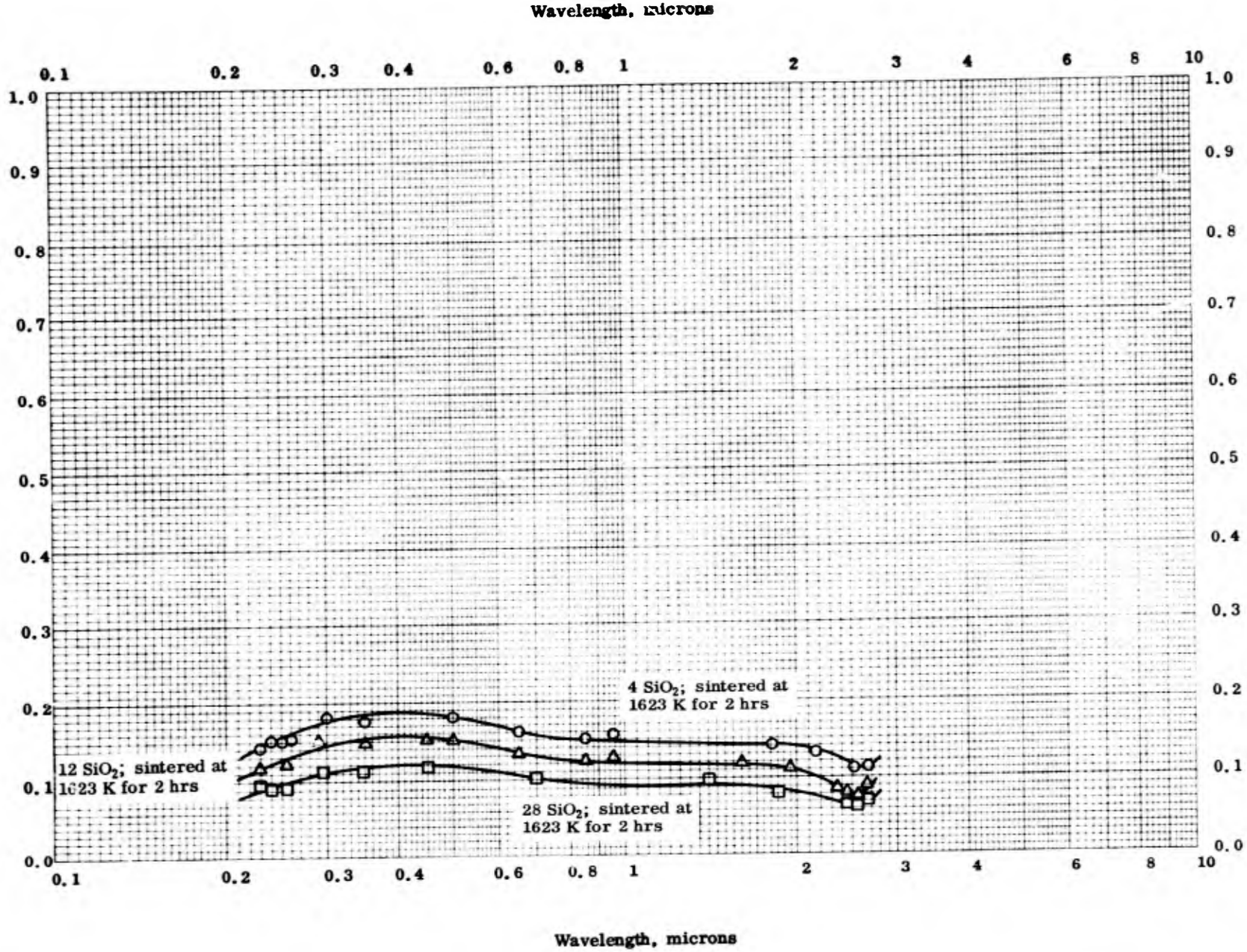


NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + SILICON DIOXIDE

NORMAL SPECTRAL EMITTANCE -- MOLYBDENUM DISILICIDE + SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1273	1-15		96 $MoSi_2$ and 4 SiO_2; 0.05 in. thickness plate; density 4.34 g cm^{-3}.	Sintered at 1623 K for 2 hrs; measured in argon; data taken from a curve.
△	63-18	1273	1-15		88 $MoSi_2$ and 12 SiO_2; 0.065 in. thickness plate; density 4.25 g cm^{-3}.	Same as above.
□	63-18	1273	1-15		72 $MoSi_2$ and 28 SiO_2; 0.051 in. thickness plate; density 2.83 g cm^{-3}.	Same as above.

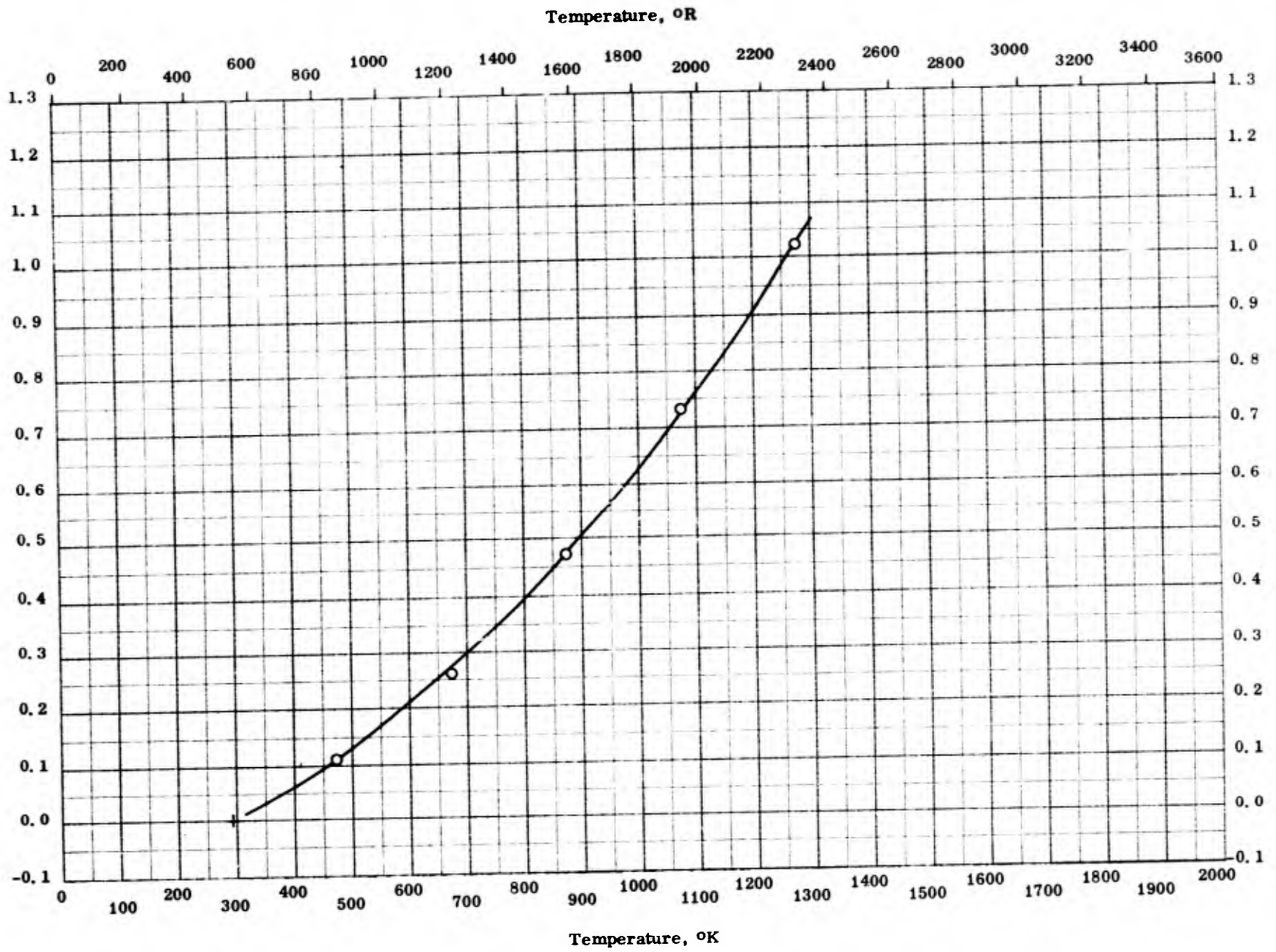


NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + SILICON DIOXIDE

NORMAL SPECTRAL REFLECTANCE -- MOLYBDENUM DISILICIDE + SILICON DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	96 $MoSi_2$ and 4 SiO_2; 0.05 in. thickness plate; density 4.34 g cm^{-3}.	Sintered at 1623 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	88 $MoSi_2$ and 12 SiO_2; 0.065 in. thickness plate; density 4.25 g cm^{-3}.	Same as above.
□	63-18	298	0.23-2.65	5	72 $MoSi_2$ and 28 SiO_2; 0.051 in. thickness plate; density 2.83 g cm^{-3}.	Same as above.



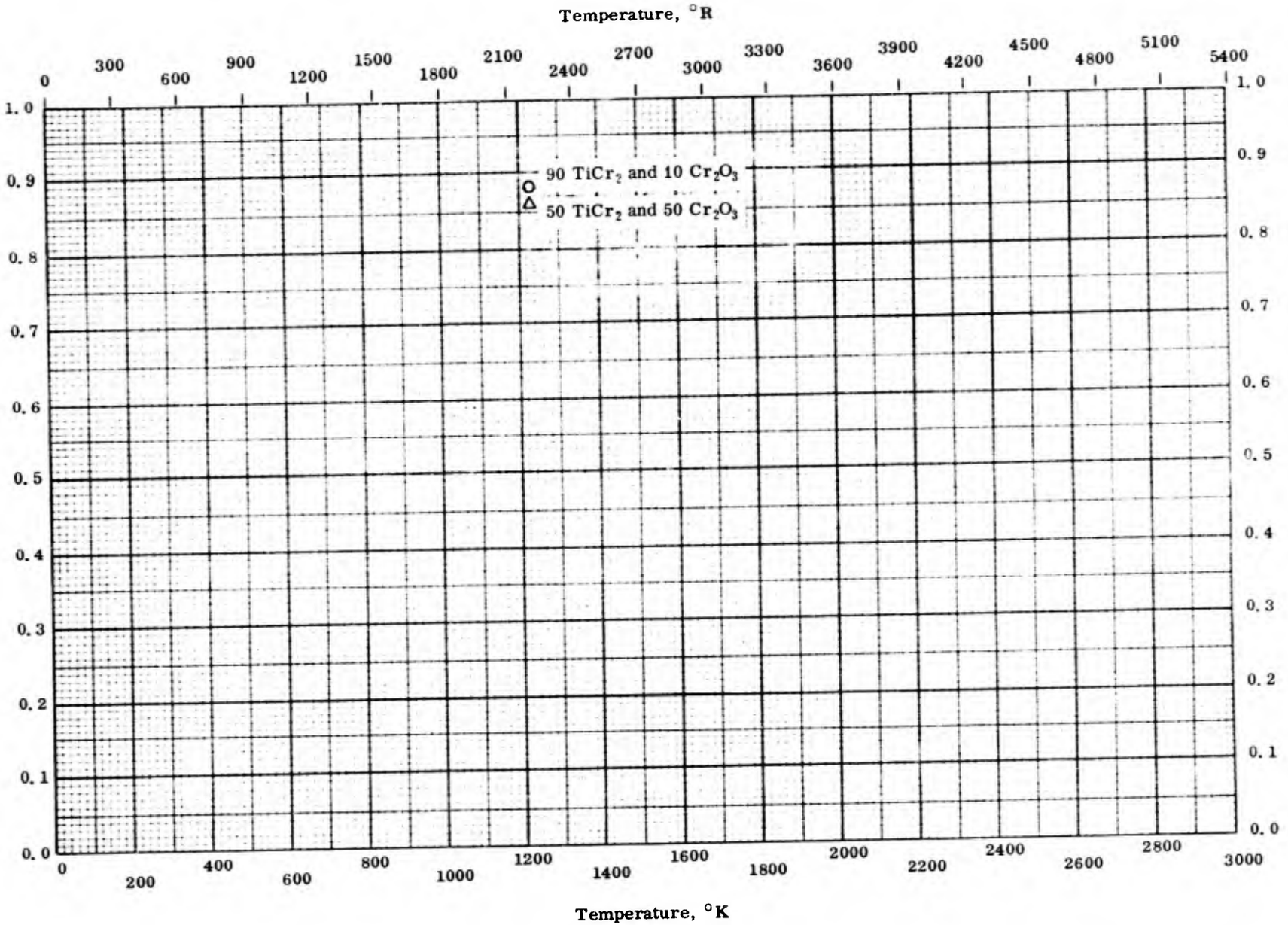
THERMAL LINEAR EXPANSION -- CHROMIUM - TITANIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

TPRC

THERMAL LINEAR EXPANSION -- CHROMIUM - TITANIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-13	298-1273		95 Cr_2Ti and 5 Cr_2O_3; 58.8 Cr, 32.1 Ti, 7.0 O, and 2.1 N.	



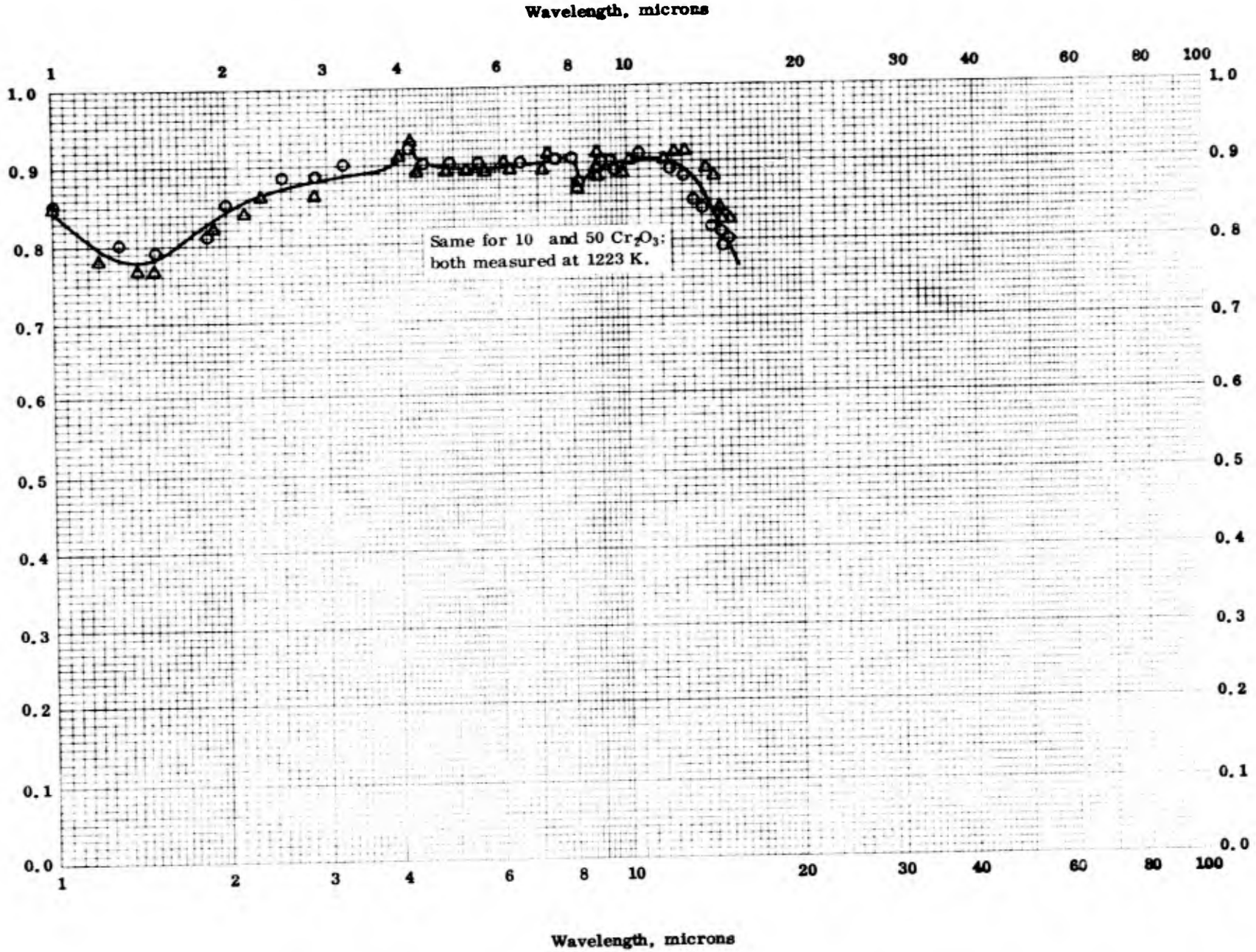
NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	90 $TiCr_2$ and 10 Cr_2O_3; 0.054 in. thickness plate; density 3.36 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon; calculated from spectral data.
Δ	63-18	1223	± 8	50 $TiCr_2$ and 50 Cr_2O_3; 0.045 in. thickness plate; density 3.40 g cm^{-3}.	Same as above.



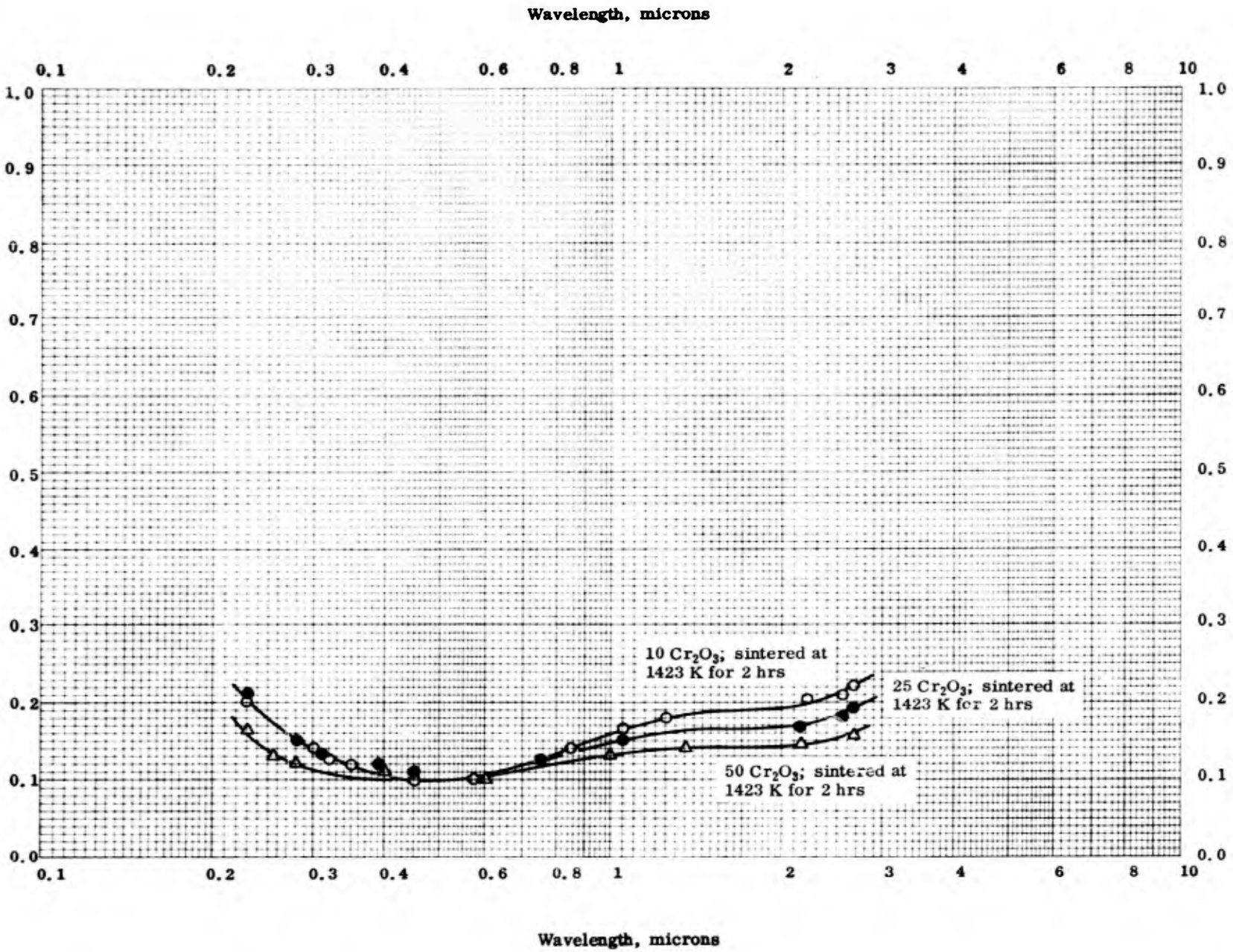
NORMAL SPECTRAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	1-15		90 $TiCr_2$ and 10 Cr_2O_3; 0.054 in. thickness plate; density 3.36 g cm^{-3}.	Sintered at 1425 K for 2 hrs; measured in argon; data taken from a curve.
△	63-18	1223	1-15		50 $TiCr_2$ and 50 Cr_2O_3; 0.045 in. thickness plate; density 3.40 g cm^{-3}.	Same as above.

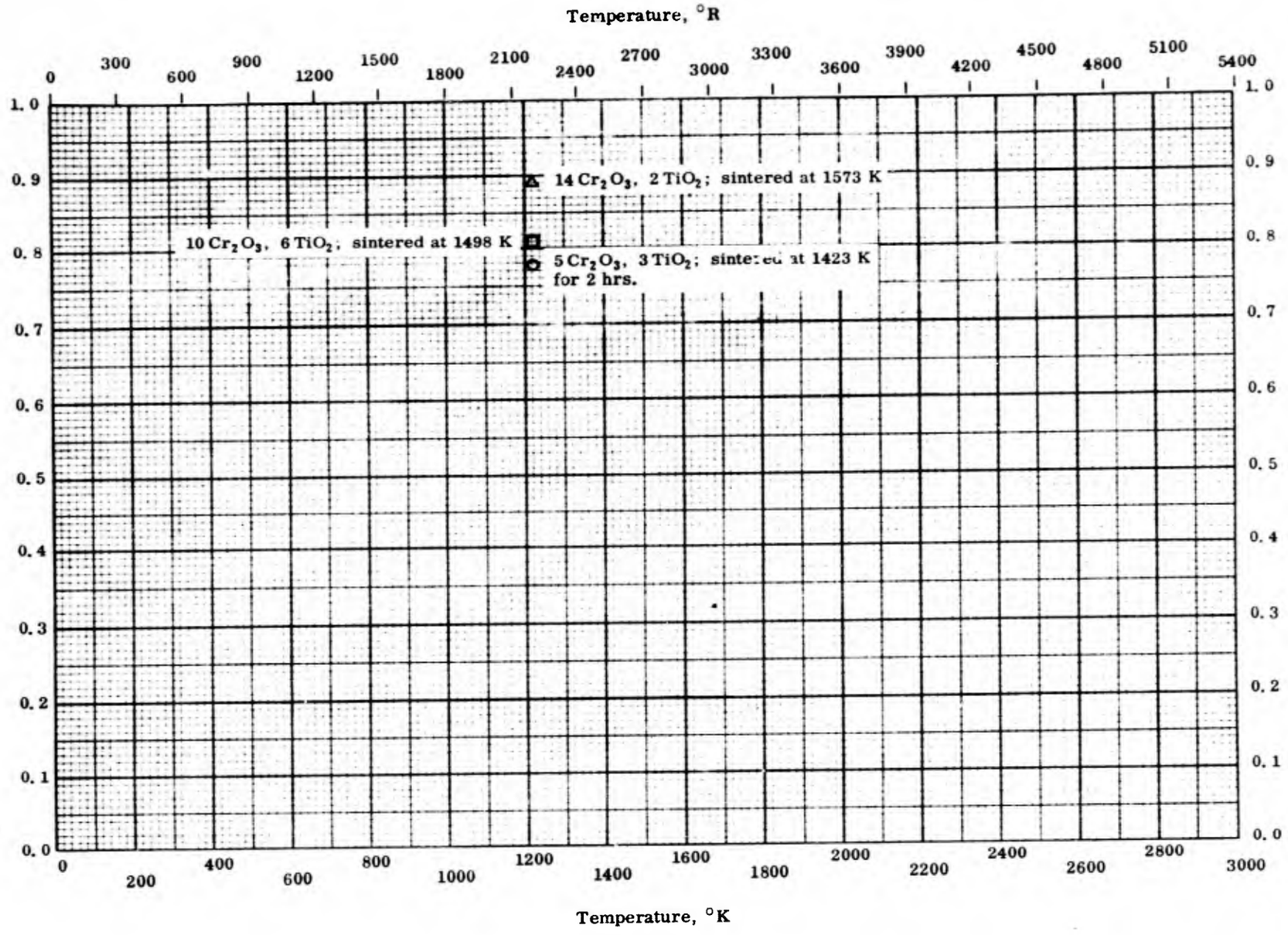


NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	90 $TiCr_2$ and 10 Cr_2O_3; 0.054 in. thickness plate; density 3.36 g cm^{-3}.	Sintered at 1423 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
●	63-18	298	0.23-2.65	5	75 $TiCr_2$ and 25 Cr_2O_3; 0.072 in. thickness plate; density 3.51 g cm^{-3}.	Same as above.
△	63-18	298	0.23-2.65	5	50 $TiCr_2$ and 50 Cr_2O_3; 0.045 in. thickness plate; density 3.40 g cm^{-3}.	Same as above.

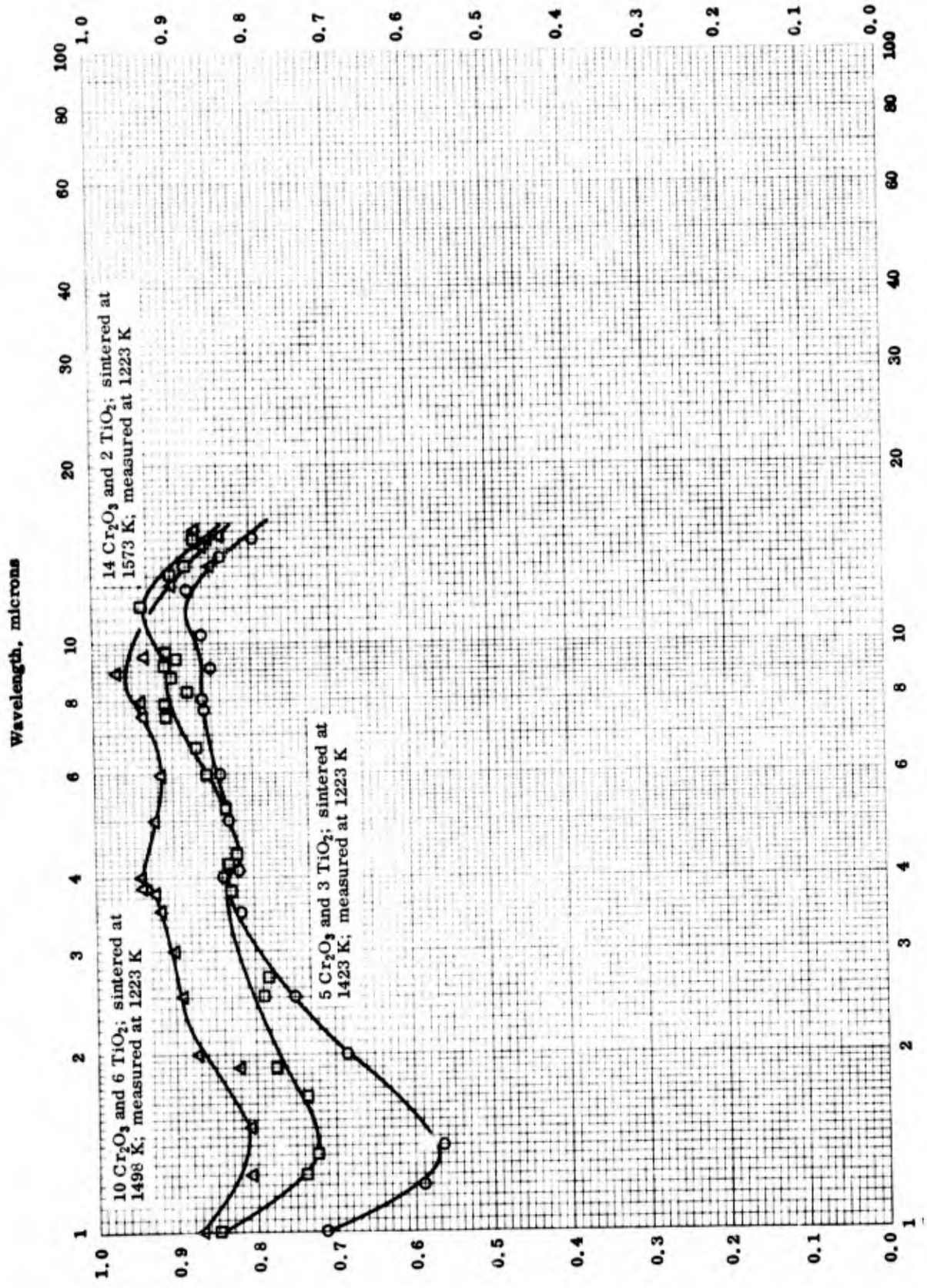


NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	± 8	92 $TiCr_2$, 5 Cr_2O_3, and 3 TiO_2; 0.06 in. thickness plate; density 3.73 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon atm.; calculated from spectral data.
△	63-18	1223	± 8	84 $TiCr_2$, 10 Cr_2O_3, and 6 TiO_2; 0.05 in. thickness plate; density 3.59 g cm^{-3}.	Same as above except sintered at 1498 K for 2 hrs.
□	63-18	1223	± 8	84 $TiCr_2$, 14 Cr_2O_3, and 2 TiO_2; 0.06 in. thickness plate; density 4.08 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

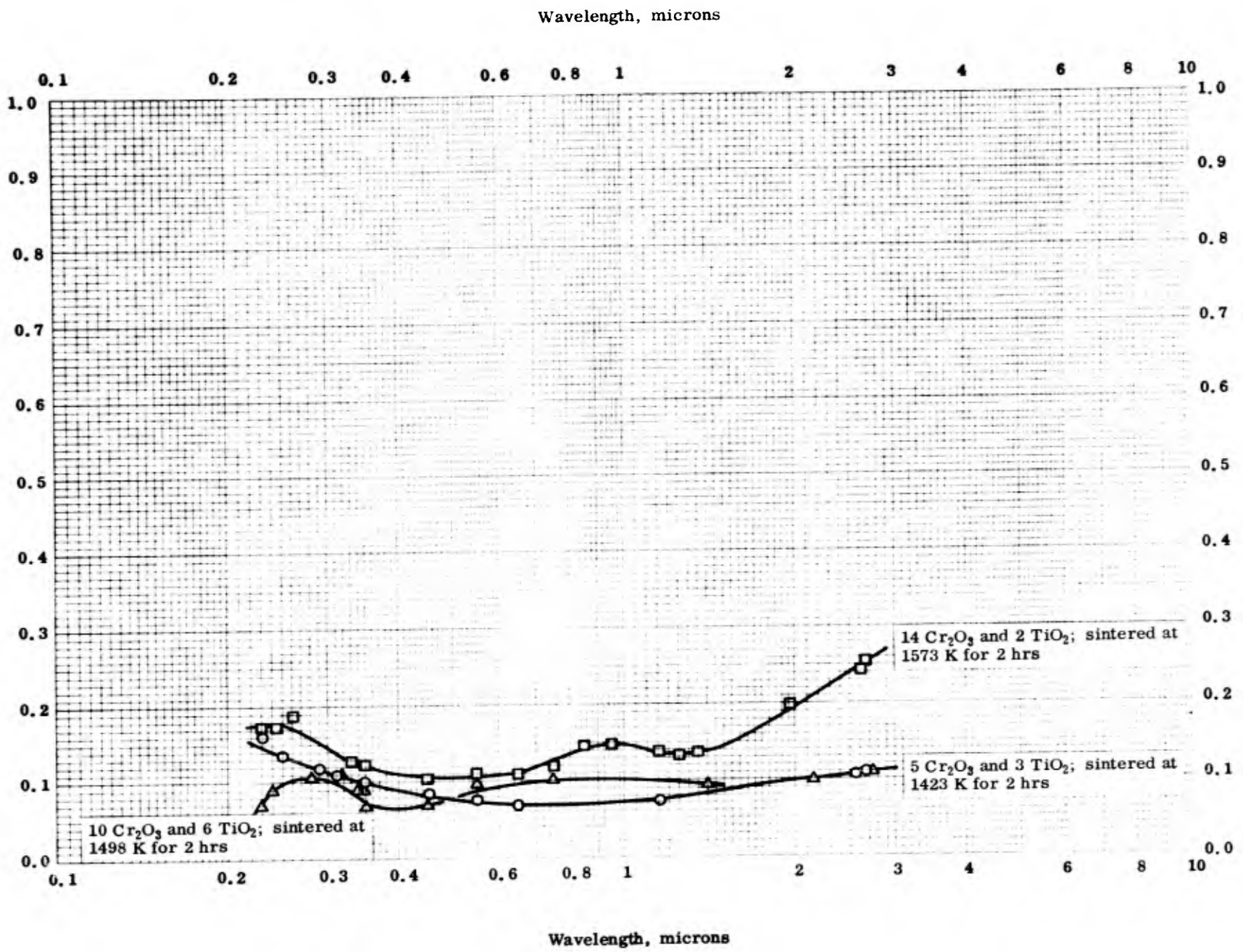


NORMAL SPECTRAL EMITTANCE — TITANIUM – CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

NORMAL SPECTRAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15		92 $TiCr_2$, 5 Cr_2O_3, and 3 TiO_2, 0.06 in. thickness plate; density 3.73 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1223	1-15		84 $TiCr_2$, 10 Cr_2O_3, and 6 TiO_2; 0.05 in. thickness plate; density 3.59 g cm^{-3}.	Same as above except sintered at 1498 K for 2 hrs.
□	63-18	1223	1-15		84 $TiCr_2$, 14 Cr_2O_3, and 2 TiO_2; 0.06 in. thickness plate; density 4.08 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

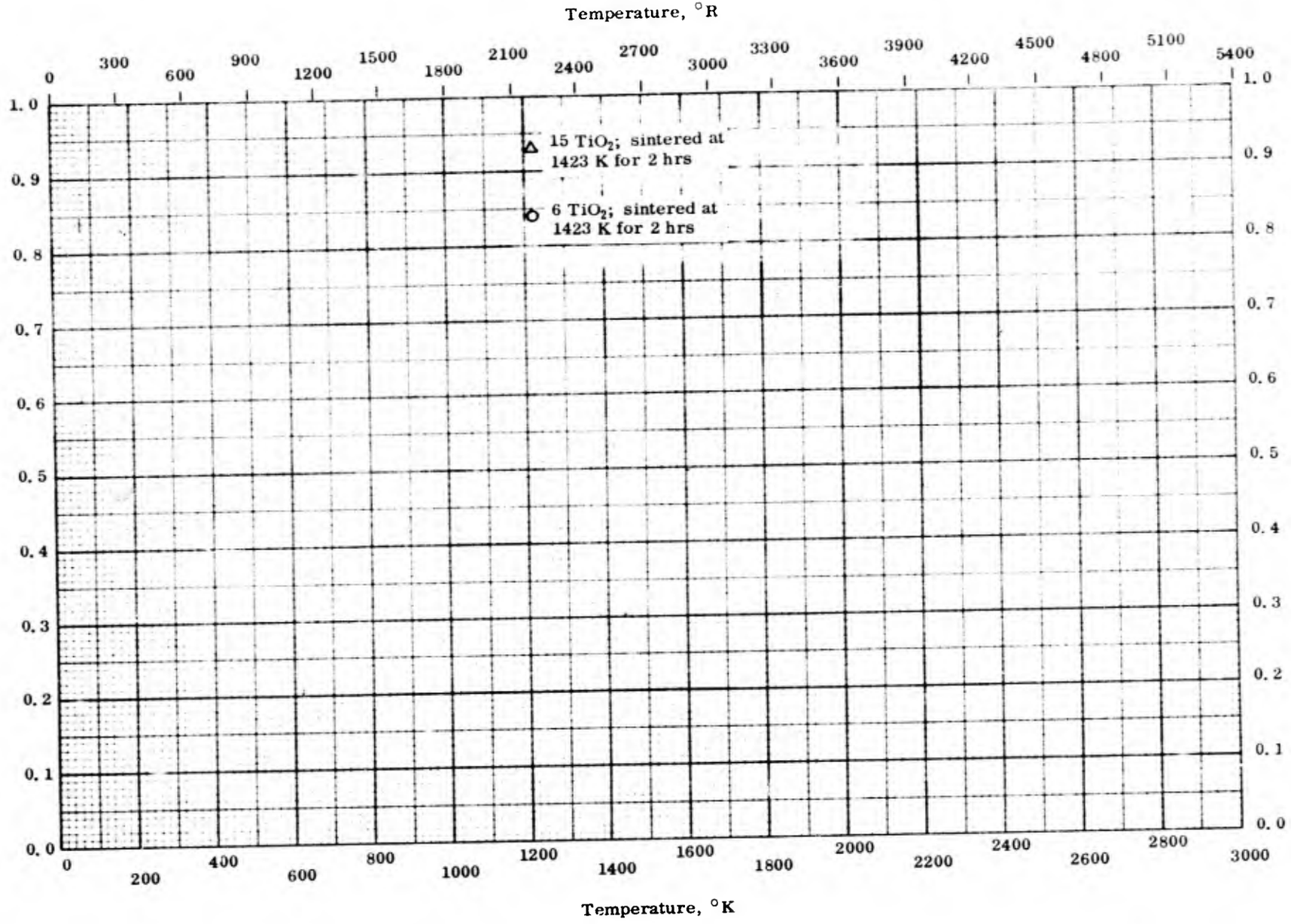


NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + CHROMIUM SESQUIOXIDE + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	92 $TiCr_2$, 5 Cr_2O_3, and 3 TiO_2; 0.06 in. thickness plate; density 3.73 g cm^{-3}.	Sintered at 1423 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	84 $TiCr_2$, 10 Cr_2O_3, and 6 TiO_2; 0.05 in. thickness plate; density 3.59 g cm^{-3}.	Same as above except sintered at 1498 K for 2 hrs.
□	63-18	298	0.23-2.65	5	84 $TiCr_2$, 14 Cr_2O_3, and 2 TiO_2; 0.06 in. thickness plate; density 4.08 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.



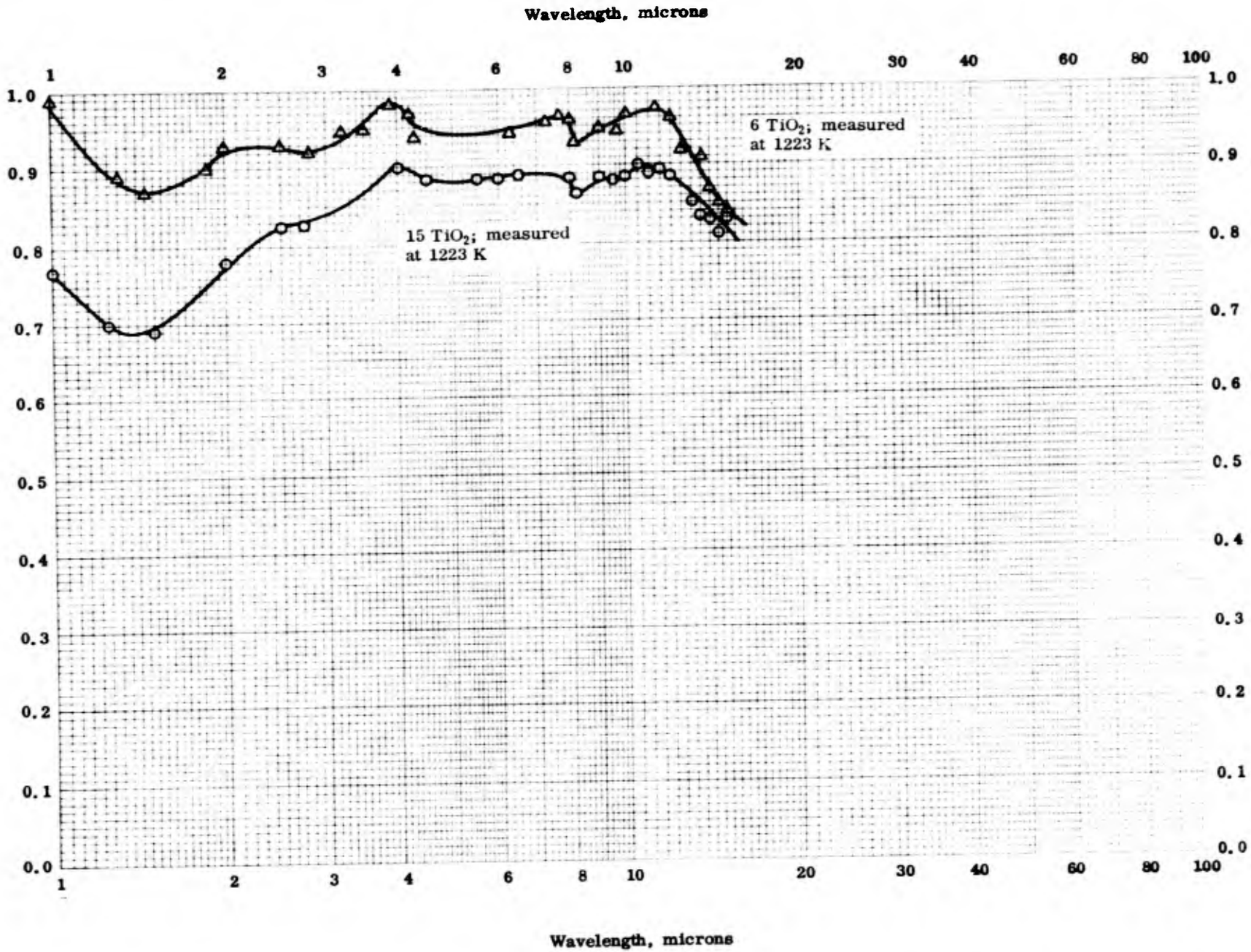
NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-18	1223	± 8	94 $TiCr_2$ and 6 TiO_2; 0.04 in. thickness plate; density 3.20 g cm^{-3}.	Sintered at 1423 K for 2 hrs; measured in argon atmosphere; calculated from spectral data.
Δ	63-18	1223	± 8	85 $TiCr_2$ and 15 TiO_2; 0.04 in. thickness plate; density 3.25 g cm^{-3}.	Same as above.

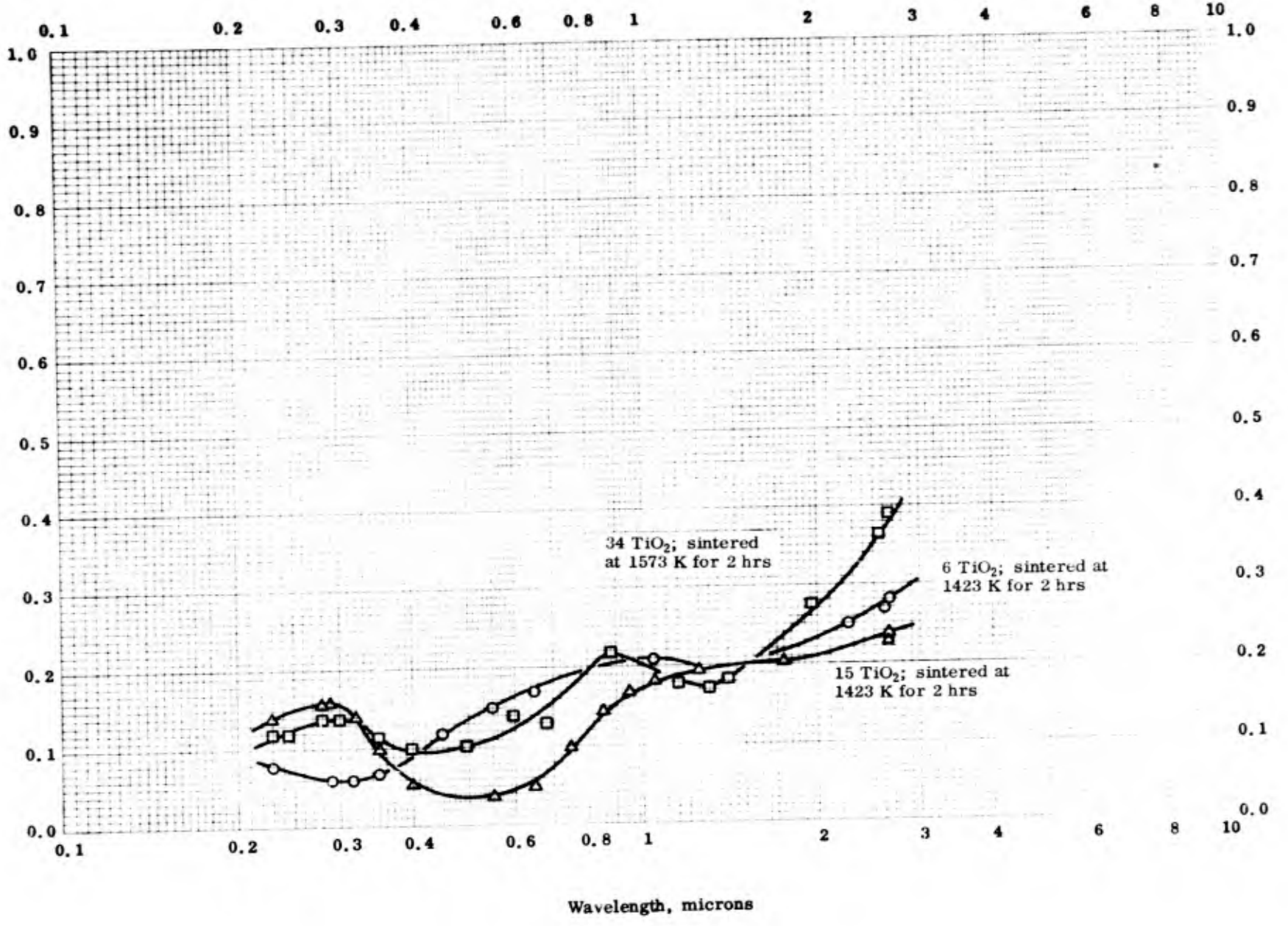


NORMAL SPECTRAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

NORMAL SPECTRAL EMITTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	1223	1-15		94 $TiCr_2$ and 6 TiO_2; 0.04 in. thickness plate; density 3.20 g cm^{-3}.	Sintered at 1423 for 2 hrs; measured in argon atmosphere; data taken from a curve.
△	63-18	1223	1-15		85 $TiCr_2$ and 15 TiO_2; 0.04 in. thickness plate; density 3.25 g cm^{-3}.	Same as above.



Normal Spectral Reflectance

Normal Spectral Reflectance

TPRC

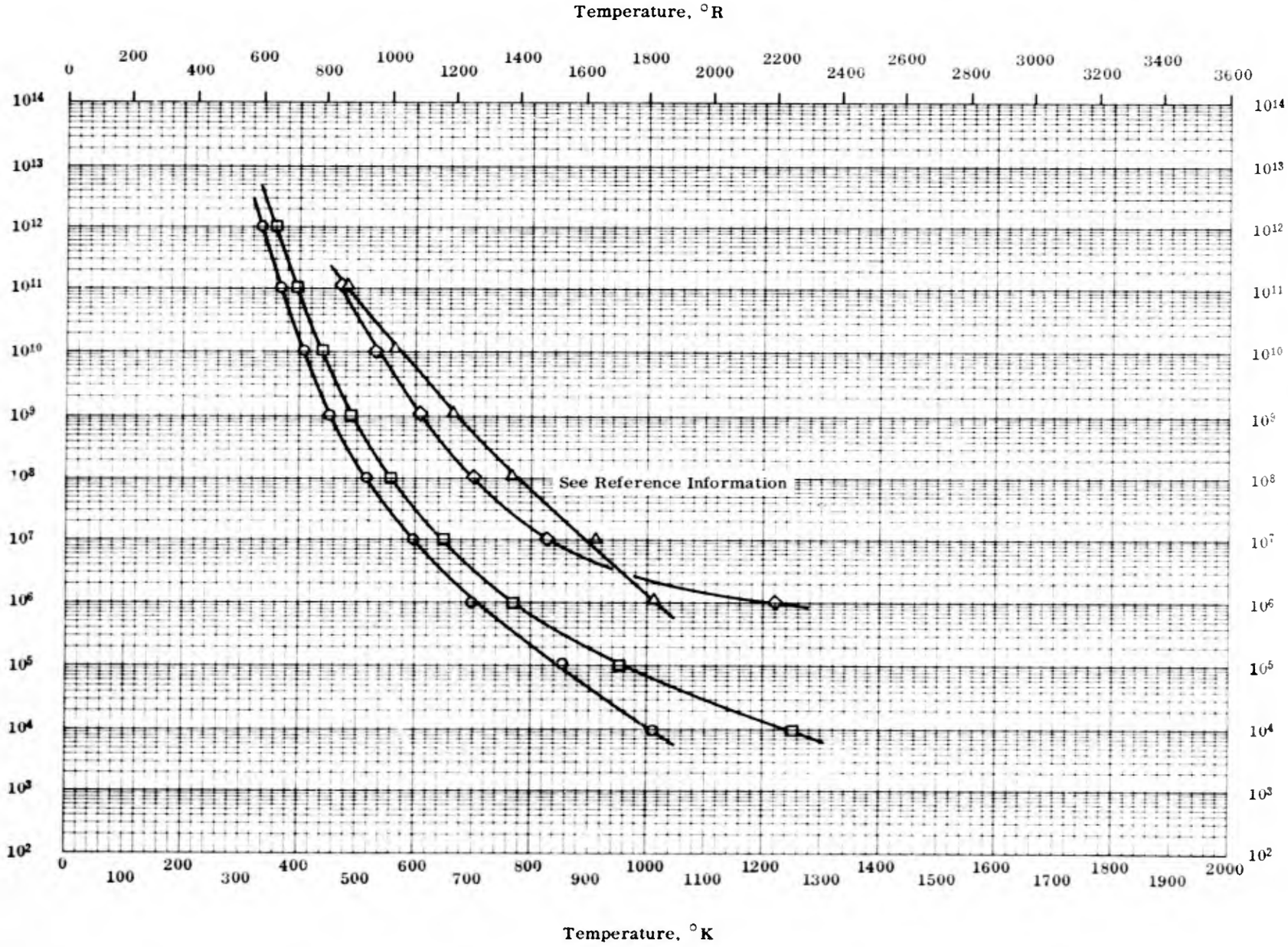
NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

NORMAL SPECTRAL REFLECTANCE -- TITANIUM - CHROMIUM INTERMETALLICS + TITANIUM DIOXIDE

REFERENCE INFORMATION

Symbol	Ref.	Temp. °K	Wavelength Range, μ	Rept. Error %	Sample Specifications	Remarks
○	63-18	298	0.23-2.65	5	94 $TiCr_2$ and 6 TiO_2; 0.04 in. thickness plate; density 3.20 g cm^{-3}.	Sintered at 1423 K for 2 hrs; data taken from a curve; normal incidence, hemispherical viewing; MgO as reference standard.
△	63-18	298	0.23-2.65	5	85 $TiCr_2$ and 15 TiO_2; 0.04 in. thickness plate; density 3.25 g cm^{-3}.	Same as above.
□	63-18	298	0.23-2.65	5	66 $TiCr_2$ and 34 TiO_2; 0.045 in. thickness plate; density 3.06 g cm^{-3}.	Same as above except sintered at 1573 K for 2 hrs.

MISCELLANEOUS CERAMIC MATERIALS



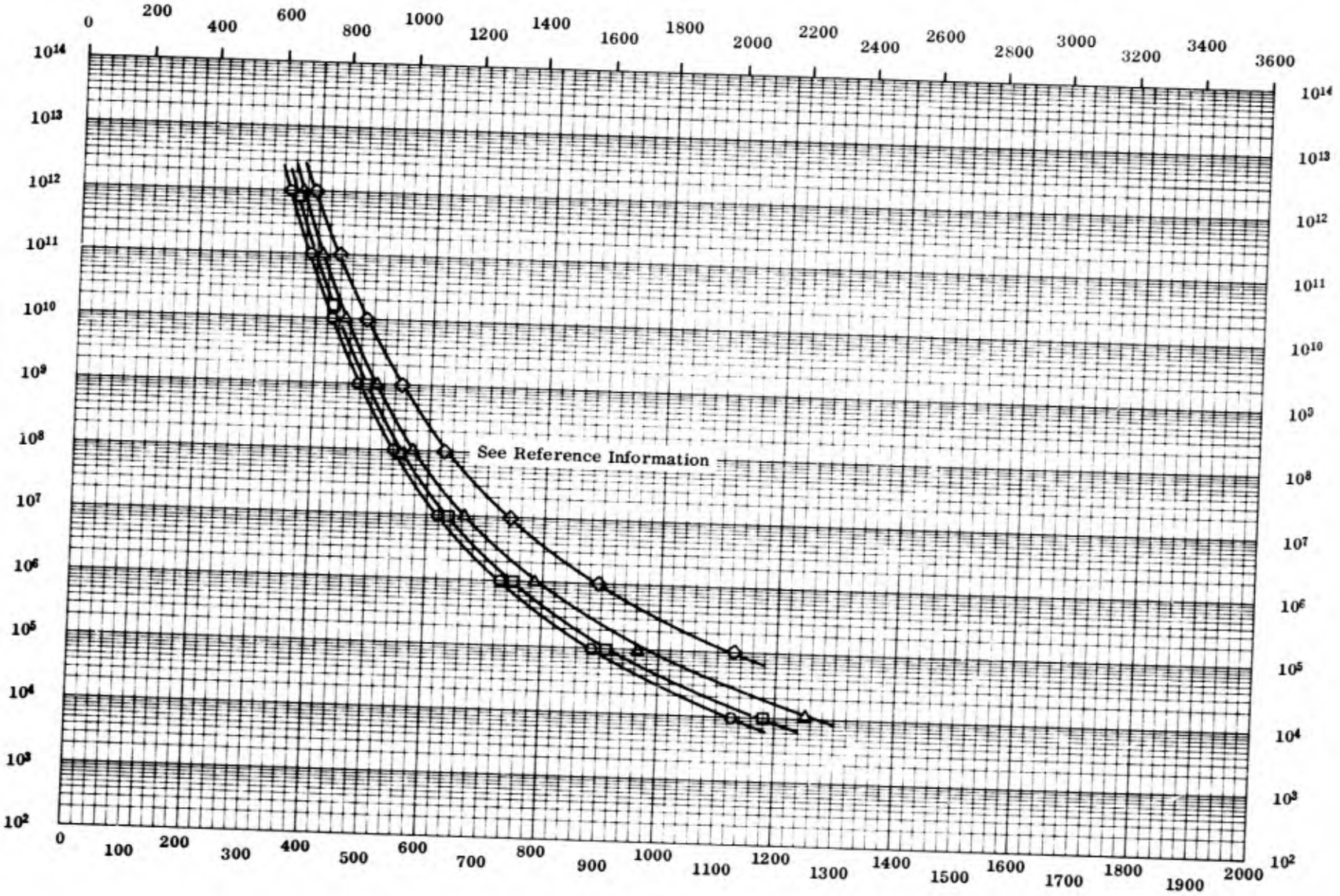
TPRC

ELECTRICAL RESISTIVITY-- VITREOUS BONDED ALUMINUM TITANATE
(72-78 vol% $Al_2O_3 \cdot TiO_2$; 12-27 vol% α-Al_2O_3 Inclusions; 0-11 vol% Mullite)

ELECTRICAL RESISTIVITY -- VITREOUS BONDED ALUMINUM TITANATE
(72-78 vol% $Al_2O_3 \cdot TiO_2$; 12-27 vol% α-Al_2O_3 Inclusions; 0-11 vol% Mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	334-1099		77.0 vol% $Al_2O_3 \cdot TiO_2$ crystals, 15.0 vol% isotropic glass, 8.0% mullite crystals; apparent porosity 6.50%; interstitial material of mullite and glass with average crystal size of 23 μ.	Equimolar mix of Al_2O_3 and TiO_2; fused, powdered, and fired to 1650 C.
□	50-4	357-1250		74.0 vol% $Al_2O_3 \cdot TiO_2$ crystals, 19.1 vol% α-Al_2O_3 inclusions, 6.4 vol% mullite crystals, 0.5% isotropic glass; apparent porosity 5.81%.	59.9 equimolar mix of ignited γ-Al_2O_3 and TiO_2; powdered, mixed with 40.1 Al_2O_3, fired to 1650 C.
△	50-4	478-1010		75.3 vol% $Al_2O_3 \cdot TiO_2$ crystals, 23.7 vol% α-Al_2O_3 inclusions, 1.0 vol% mineral impurities; apparent porosity 16.0%.	69.6 fused Al_2O_3 and 30.4 c.p. TiO_2 ball-milled, dried at 110 C, 5% wax binder added, pressed at 10,000 lb in^{-2}, fired to 650 C in 8 hrs to remove binder, heated to 1820 C in 26 hrs, held 1 hr, furnace cooled to room temp.
◇	50-4	476-1220		72.1 vol% $Al_2O_3 \cdot TiO_2$ crystals, 26.9 vol% α-Al_2O_3 inclusions, 1.0 vol% mineral impurities; apparent porosity 10.5%.	Same as above, except 71.9 fused Al_2O_3 and 28.1 c.p. TiO_2 were milled.

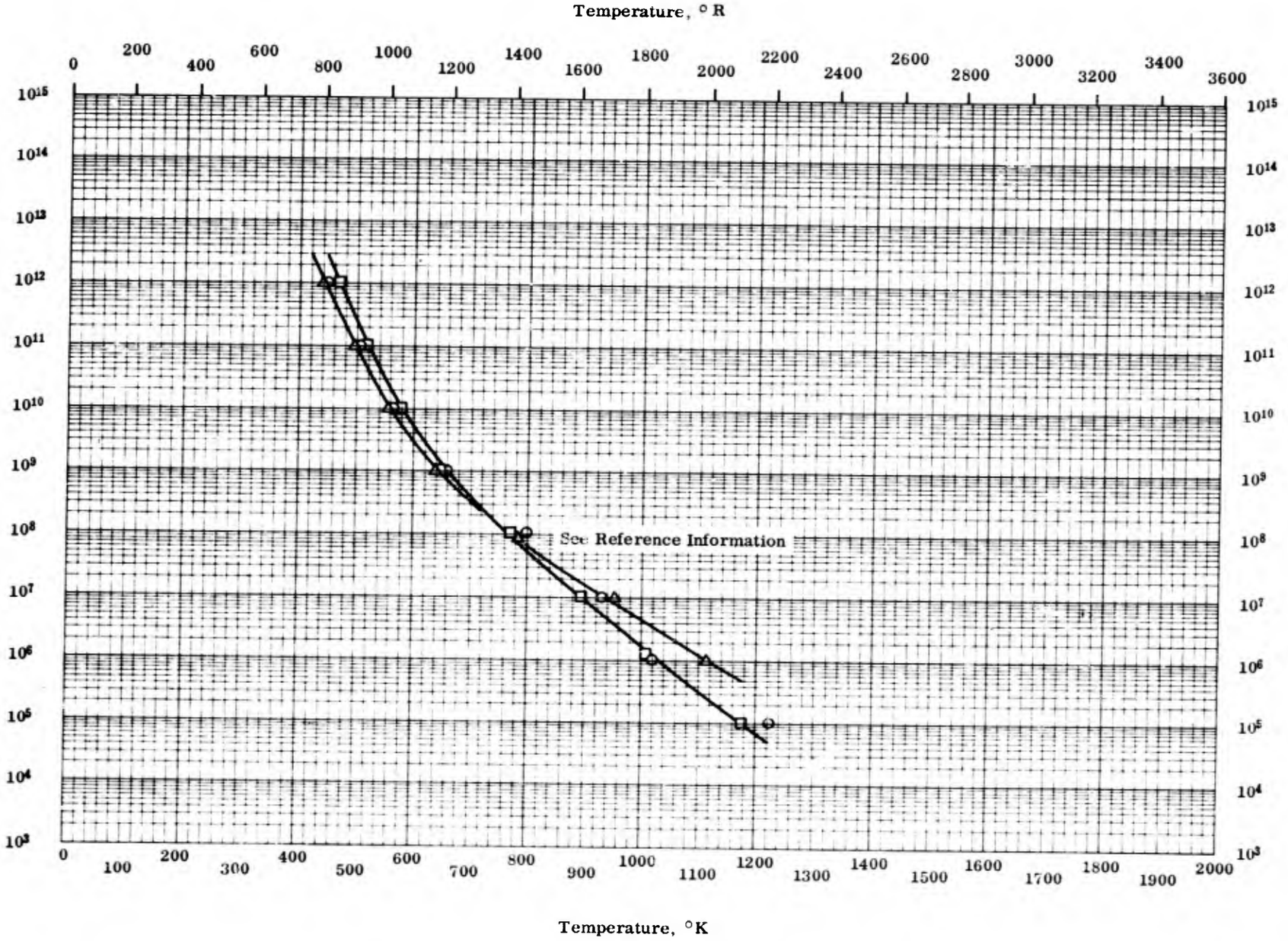


ELECTRICAL RESISTIVITY -- VITREOUS BONDED ALUMINUM TITANATE
(80-90 vol% $Al_2O_3 \cdot TiO_2$; 0-10 vol% α-Al_2O_3 Inclusions; 1-16 vol% Mullite)

ELECTRICAL RESISTIVITY -- VITREOUS BONDED ALUMINUM TITANATE
(80-90 vol% $Al_2O_3 \cdot TiO_2$; 0-10 vol% α-Al_2O_3 Inclusions; 1-16 vol% Mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	355-1124		81.3 vol% $Al_2O_3 \cdot TiO_2$ crystals, 15.7 vol% isotropic glass, 3.0 vol% mullite crystals; apparaent porosity 5.76%.	Equimolar mix of ignited γ-Al_2O_3 and c.p. TiO_2 prepared, reground, mixed with c.p. TiO_2 as required, and refired to 1650 C.
□	50-4	360-1176		81.3 vol% $Al_2O_3 \cdot TiO_2$ crystals, 17.7 vol% isotropic glass, 1.0 vol% mullite crystals; apparent porosity 5.33%.	Same as above.
△	50-4	370-1250		89.3 vol% $Al_2O_3 \cdot TiO_2$ crystals, 9.7 vol% isotropic glass, 1.0 vol% mullite crystals; apparent porosity 8.40%.	Same as above.
◇	50-4	394-1124		83.9 vol% $Al_2O_3 \cdot TiO_2$ crystals, 9.2 vol% mullite crystals, 4.9 vol% α-Al_2O_3 inclusions, 2.0 vol% isotropic glass; apparent porosity 5.57%.	59.9 fused $Al_2O_3 \cdot TiO_2$ powdered, mixed with 40.1 fused Al_2O_3, fired to 1650 C.

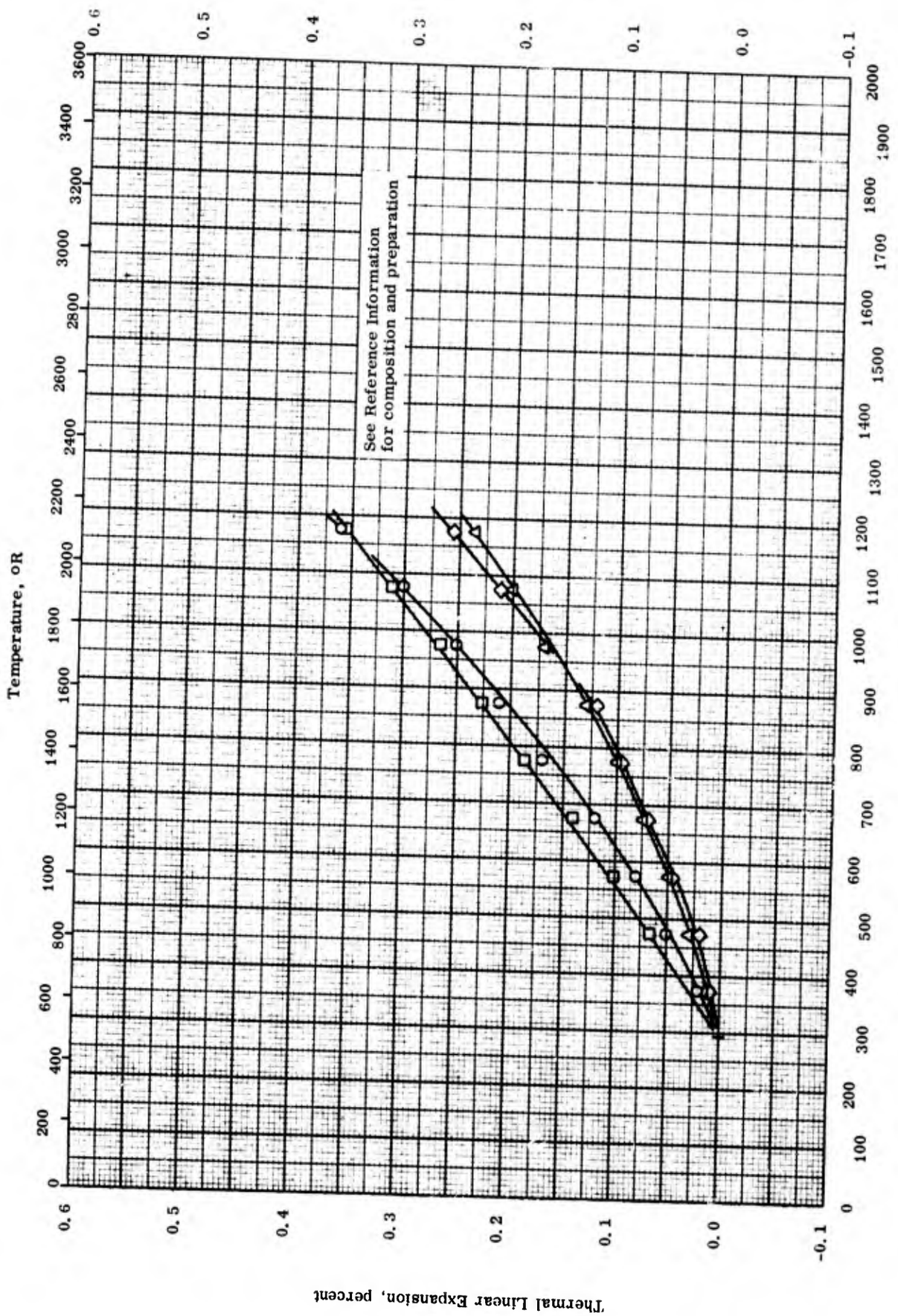


ELECTRICAL RESISTIVITY -- VITREOUS BONDED ALUMINUM TITANATE
(91-94 vol% $Al_2O_3 \cdot TiO_2$; 5-8 vol% α - Al_2O_3 Inclusions)

ELECTRICAL RESISTIVITY -- VITREOUS BONDED ALUMINUM TITANATE
(91-94 vol% $Al_2O_3 \cdot TiO_2$; 5-8 vol% α - Al_2O_3 Inclusions)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	448-1220		93.7 vol% $Al_2O_3 \cdot TiO_2$ crystals, 5.3 vol% - Al_2O_3 inclusions, and 1.0 vol% mineral impurities; porosity 22.3%.	Ball milled, dried at 110 C, wax added, pressed at 10,000 psi, fired 8 hrs at 650 C, raised to 1820 C in 26 hrs, held 1 hr at 1820 C, and furnace cooled to room temp.
□	50-4	467-1176		91.7 vol% $Al_2O_3 \cdot TiO_2$ crystals, 7.3 vol% - Al_2O_3 inclusions, and 1.0 vol% mineral impurities; porosity 26.8%.	Same as above.
△	50-4	441-1111		91.1 vol% $Al_2O_3 \cdot TiO_2$ crystals, 7.9 vol% - Al_2O_3 inclusions, and 1.0 vol% mineral impurities; porosity 15.8%.	Same as above.

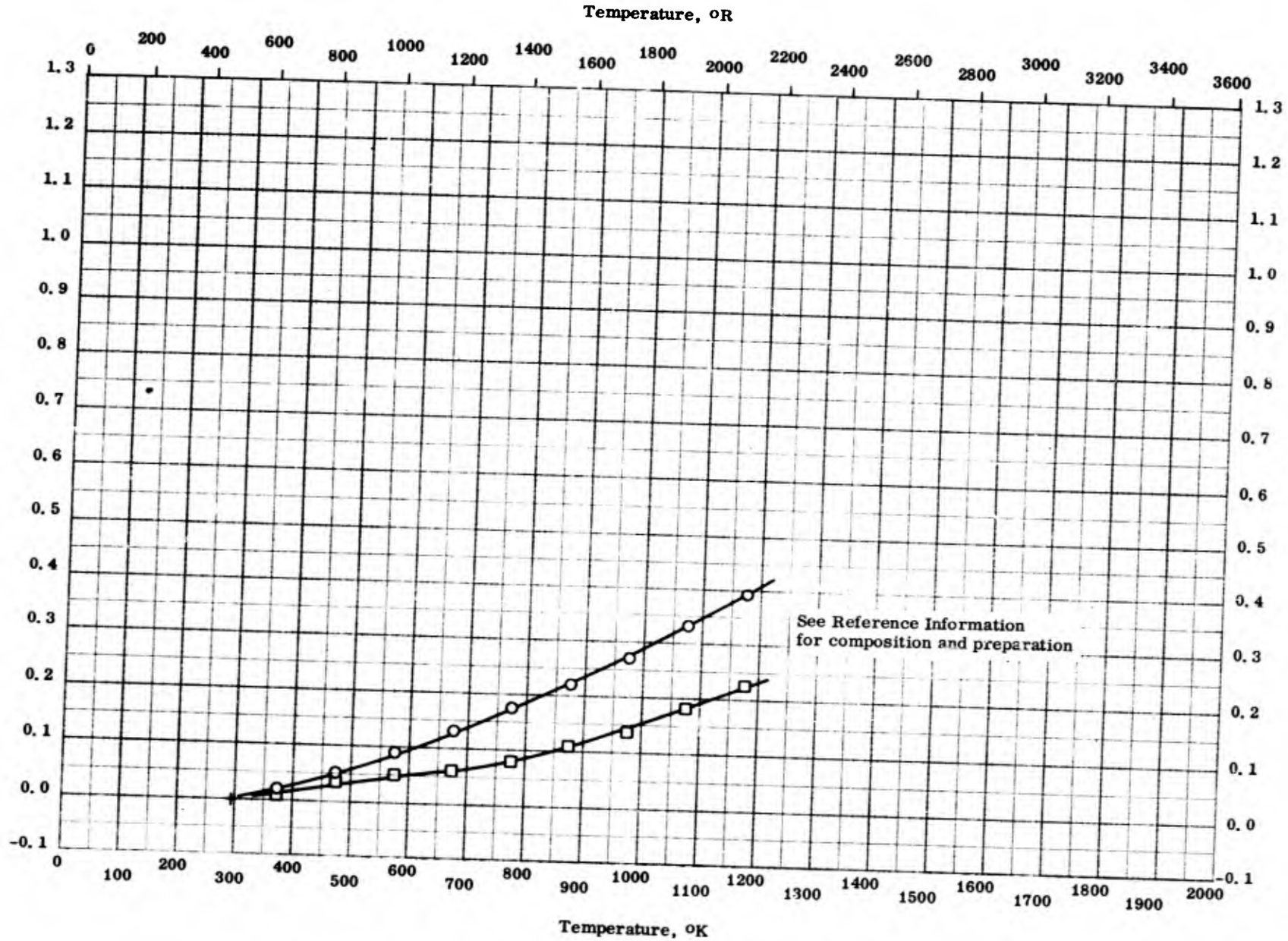


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(58 - 68 vol % $Al_2O_3 \cdot TiO_2$, 21 - 39 vol % $\alpha - Al_2O_3$ inclusions, 0 - 19 vol % mullite)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(58 - 68 vol % $Al_2O_3 \cdot TiO_2$, 21 - 39 vol % $\alpha - Al_2O_3$ inclusions, 0 - 10 vol % mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		67.5 vol % $Al_2O_3 \cdot TiO_2$ crystals, 21.6 vol % $\alpha - Al_2O_3$ inclusions, 10.0 vol % mullite crystals, and 1.0 vol % isotropic glass; apparent porosity 7.80%.	Equimolar mix of fused Al_2O_3 (6 μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb $in.^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, furnace cooled, powdered, mixed with more fused Al_2O_3, and fired to 1650 C.
□	50-4	293-1173		61.0 vol % $Al_2O_3 \cdot TiO_2$ crystals, 38.7 vol % $\alpha - Al_2O_3$ inclusions, and 0.3 vol % mineral impurities; apparent porosity 22.6%.	Ignited $\gamma - Al_2O_3$ (1 μ); treated as above.
△	50-4	293-1173		60.0 vol % $Al_2O_3 \cdot TiO_2$ crystals, 33.8 vol % $\alpha - Al_2O_3$ inclusions, 5.2 vol % mullite, and 1.0 vol % isotropic glass; apparent porosity 5.55%.	Same as above.
◇	50-4	293-1173		58.1 vol % $Al_2O_3 \cdot TiO_2$ crystals, 37.9 vol % $\alpha - Al_2O_3$ inclusions, 3.5 vol % mullite, and 0.5 vol % isotropic glass; apparent porosity 6.06%.	Same as above.

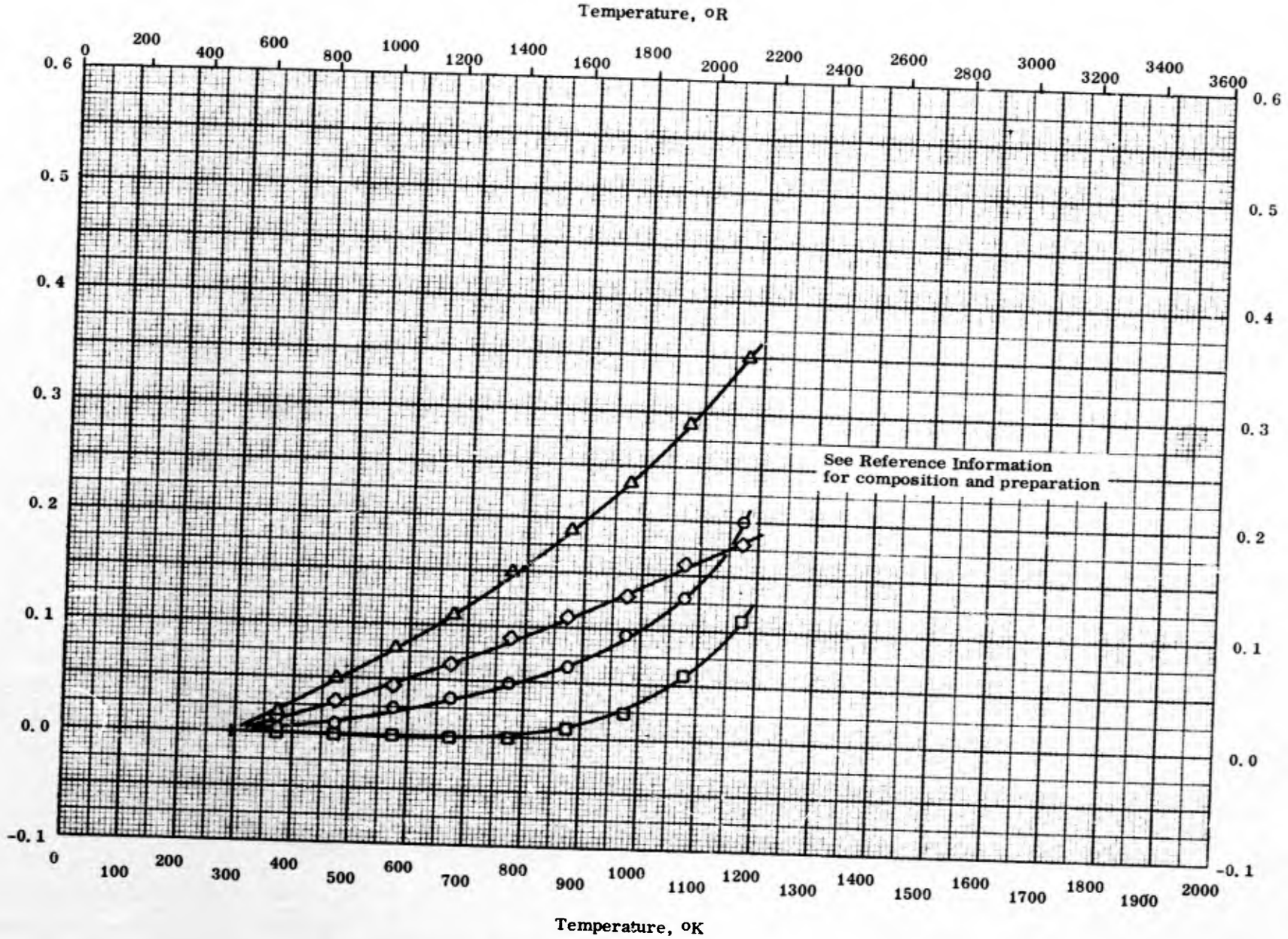


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(72 - 76 vol % $Al_2O_3 \cdot TiO_2$; 23 - 27 vol % $\alpha - Al_2O_3$ inclusions)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(72 - 76 vol % $Al_2O_3 \cdot TiO_2$; 23 - 27 vol % $\alpha - Al_2O_3$ inclusions)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		75.3 vol % $Al_2O_3 \cdot TiO_2$ crystals, 23.7 vol % $\alpha - Al_2O_3$ inclusions, and 1 vol % mineral impurities; apparent porosity 16.0%.	Fused Al_2O_3 (6 μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb $in.^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, and furnace cooled.
□	50-4	293-1173		72.1 vol % $Al_2O_3 \cdot TiO_2$ crystals, 26.9 vol % $\alpha - Al_2O_3$ inclusions, and 1 vol % mineral impurities; apparent porosity 10.5%.	Same as above.

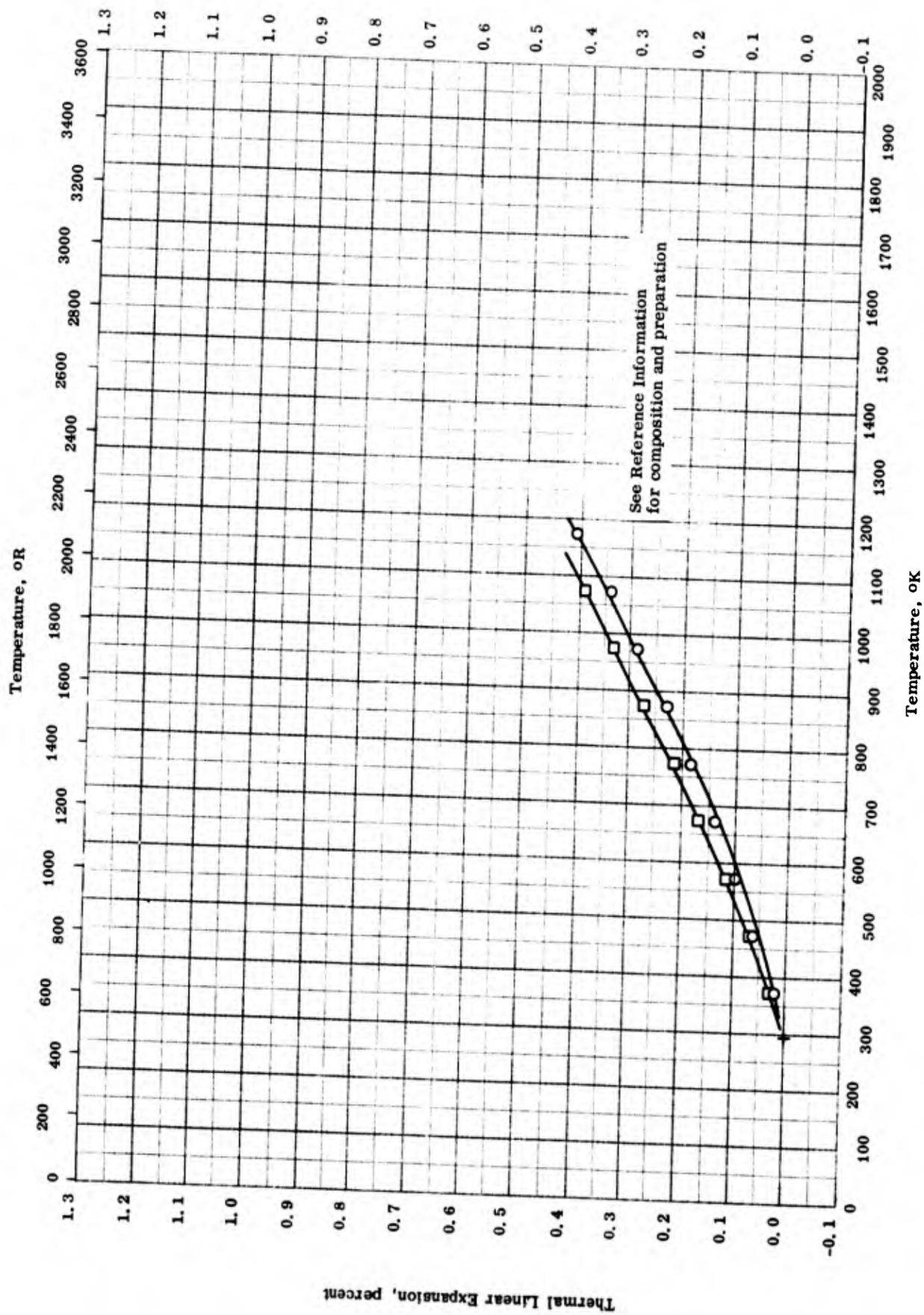


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(74 - 78 vol % $Al_2O_3 \cdot TiO_2$; 12 - 20 vol % $\alpha - Al_2O_3$ inclusions; 6 - 11 vol % mullite)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(74 - 78 vol % $Al_2O_3 \cdot TiO_2$; 12 - 20 vol % $\alpha - Al_2O_3$ inclusions; 6 - 11 vol % mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		78 vol % $Al_2O_3 \cdot TiO_2$ crystals, 11 vol % mullite crystals, and 11 vol % isotropic glass; apparent porosity 7.08%.	Equimolar mix of fused Al_2O_3 (6 μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb $in.^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, furnace cooled, powdered, mixed with more fused Al_2O_3, and fired to 1650 C.
□	50-4	293-1173		77 vol % $Al_2O_3 \cdot TiO_2$ crystals, 15 vol % isotropic glass, and 8.0 vol % mullite crystals; apparent porosity 6.5%.	Same as above.
△	50-4	293-1173		75.2 vol % $Al_2O_3 \cdot TiO_2$ crystals, 12.8 vol % $\alpha - Al_2O_3$ inclusions, 11 vol % mullite crystals, and 1.0 vol % isotropic glass; apparent porosity 6.12%.	Same as above.
◇	50-4	293-1173		74.0 vol % $Al_2O_3 \cdot TiO_2$ crystals, 19.1 vol % $\alpha - Al_2O_3$ inclusions, 6.4 vol % mullite crystals, and 0.5 vol % isotropic glass; apparent porosity 5.81%.	Ignited $\gamma - Al_2O_3$ (1 μ); treated as above.

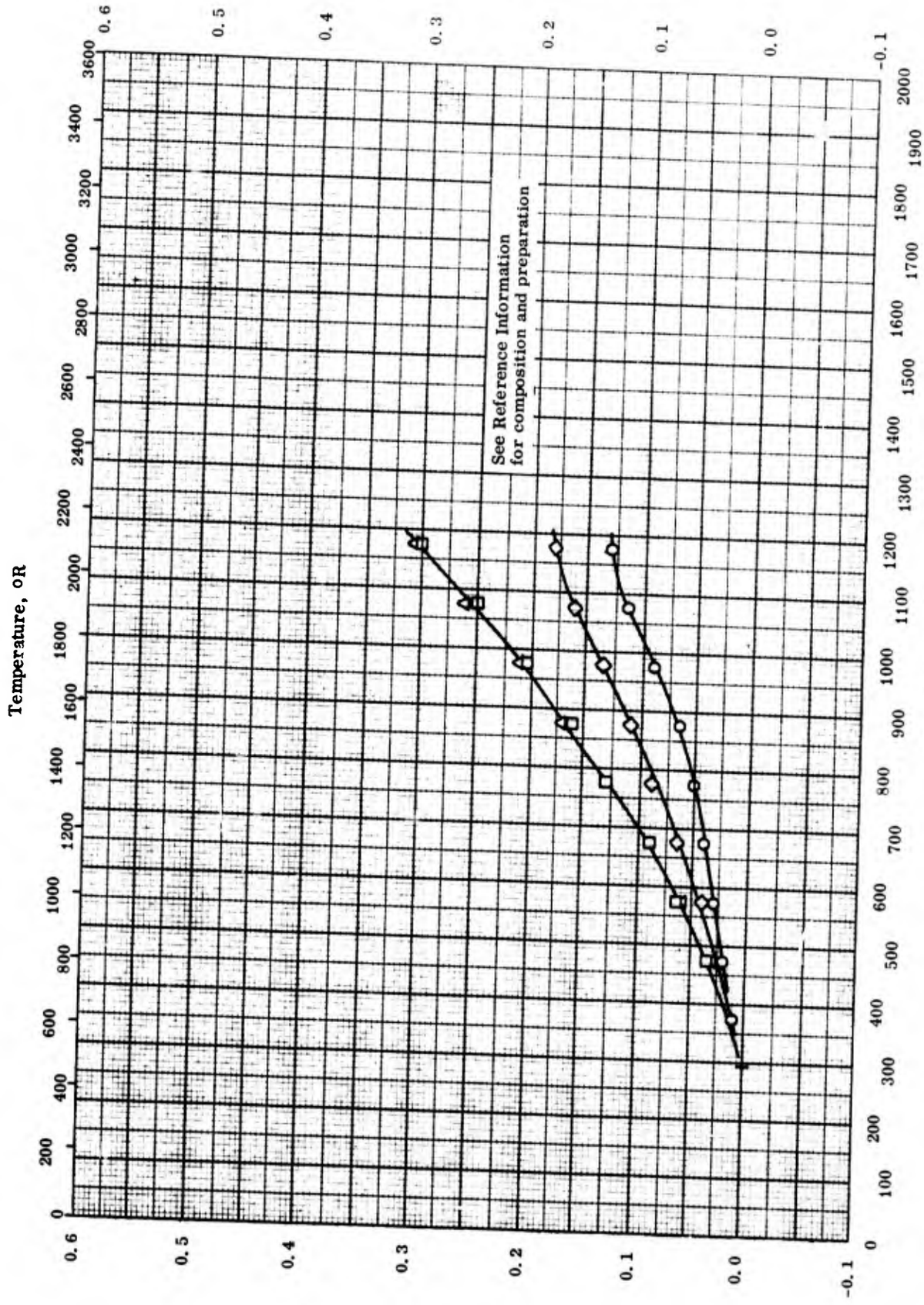


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(80 - 84 vol % $Al_2O_3 \cdot TiO_2$; 16 - 20 vol % α - Al_2O_3 inclusions)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(80 - 84 vol % $Al_2O_3 \cdot TiO_2$; 16 - 20 vol % $\alpha - Al_2O_3$ inclusions)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		83.5 vol % $Al_2O_3 \cdot TiO_2$ crystals, 16.2 vol % $\alpha - Al_2O_3$ inclusions, and 0.3 vol % mineral impurities; apparent porosity 23.9%.	Ignited $\gamma - Al_2O_3$ (1 μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb $in.^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, and furnace cooled.
□	50-4	293-1073		80.2 vol % $Al_2O_3 \cdot TiO_2$ crystals, 19.5 vol % $\alpha - Al_2O_3$ inclusions, and 0.3 vol % mineral impurities; apparent porosity 27.0%.	Same as above.

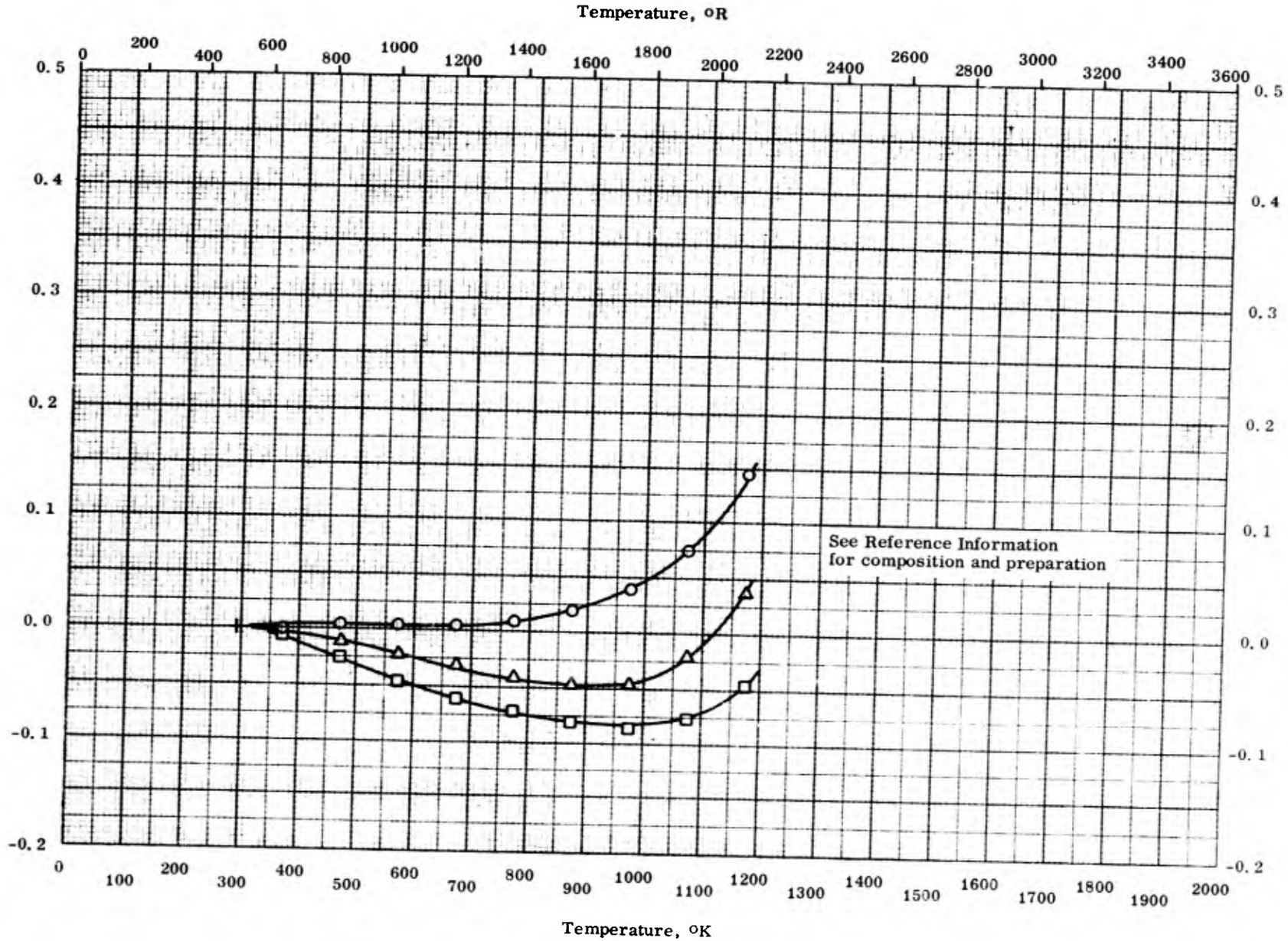


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(80 - 87 vol % $Al_2O_3 \cdot TiO_2$; 0 - 10 vol % α - Al_2O_3 inclusions; 9 - 16 vol % mullite)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(80 - 87 vol % $Al_2O_3 \cdot TiO_2$; 0 - 10 vol % $\alpha - Al_2O_3$ inclusions; 9 - 16 vol % mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		87.0 vol % $Al_2O_3 \cdot TiO_2$ crystals, 11 vol % mullite crystals, 1.0 vol % $\alpha - Al_2O_3$ inclusions, and 1.0 vol % isotropic glass; apparent porosity 6.24%.	Equimolar mix of ignited γ-Al_2O_3 (1 μ) and c. p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb $in.^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, furnace cooled, powdered, mixed with more ignited γ-Al_2O_3, and fired to 1650 C.
□	50-4	293-1173		83.9 vol % $Al_2O_3 \cdot TiO_2$ crystals, 9.2 vol % mullite crystals, 4.9 vol % $\alpha - Al_2O_3$ inclusions, and 2.0 vol % isotropic glass; apparent porosity 5.57%.	Fused Al_2O_3 (6 μ); treated as above.
△	50-4	293-1173		81 vol % $Al_2O_3 \cdot TiO_2$ crystals, 16 vol % mullite crystals, and 3 vol % isotropic glass; apparent porosity 7.08%.	Same as above.
◇	50-4	293-1173		80.6 vol % $Al_2O_3 \cdot TiO_2$ crystals, 10.0 vol % mullite crystals, 8.4 vol % $\alpha - Al_2O_3$ inclusions, and 1.0 vol % isotropic glass; apparent porosity 5.67%.	Ignited γ-Al_2O_3; treated as above.

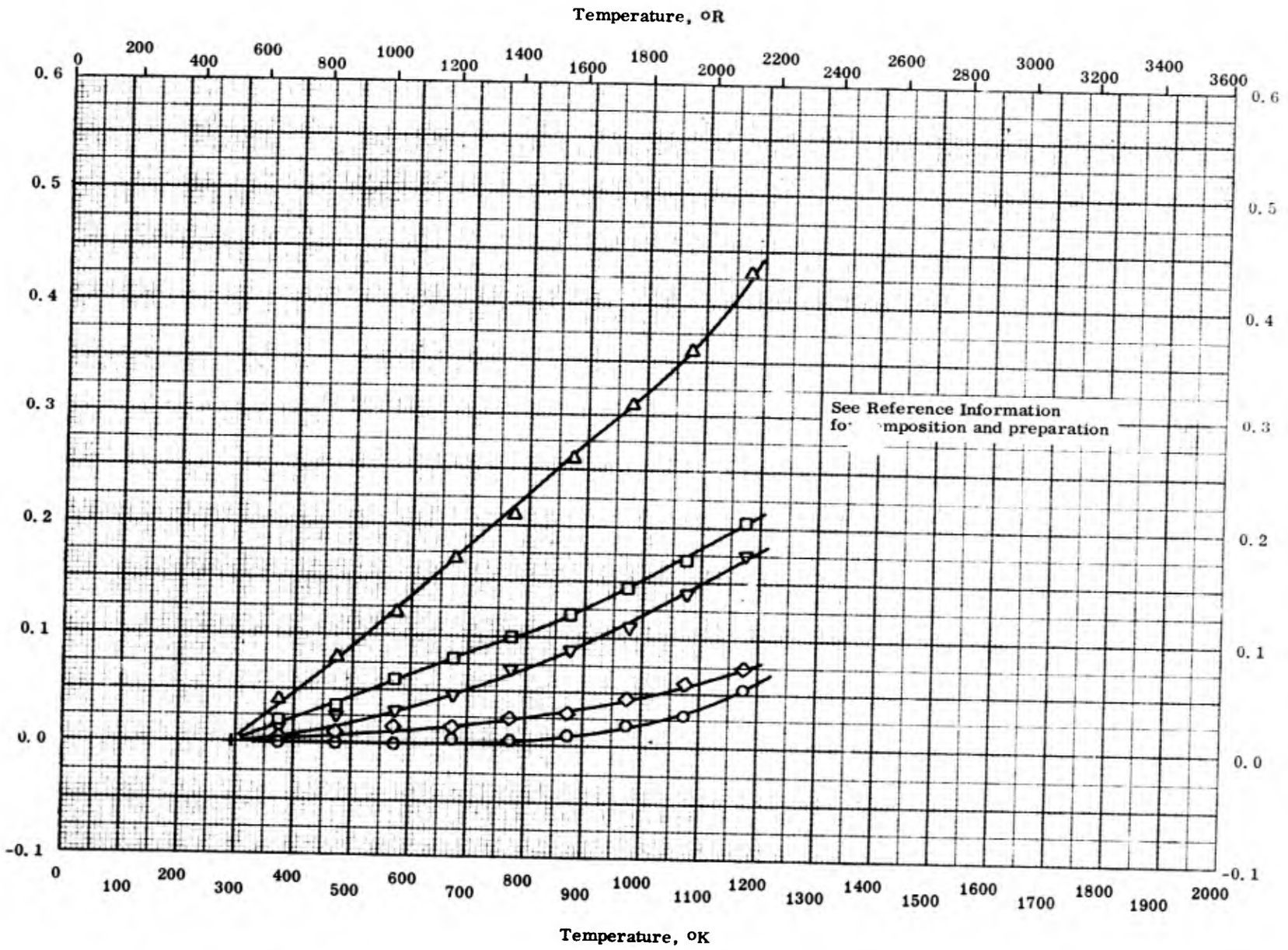


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(81 - 90 vol % $Al_2O_3 \cdot TiO_2$; 1 - 3 vol % Mullite)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(81 - 90 vol % $Al_2O_3 \cdot TiO_2$; 1 - 3 vol % Mullite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		89.3 vol % $Al_2O_3 \cdot TiO_2$ crystals, 9.7 vol % isotropic glass, and 1.0 vol % mullite crystals; apparent porosity 8.4%.	Equimolar mix of ignited γ-Al_2O_3 (1μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb in.$^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, furnace cooled, reground, mixed with c.p. TiO_2, and refired to 1650 C.
□	50-4	293-1173		81.3 vol % $Al_2O_3 \cdot TiO_2$ crystals, 15.7 vol % isotropic glass, and 3.0 vol % mullite crystals; apparent porosity 5.76%.	Same as above.
△	50-4	293-1173		81.3 vol % $Al_2O_3 \cdot TiO_2$ crystals, 17.7 vol % isotropic glass, and 1.0 vol % mullite crystals; apparent porosity 5.33%.	Same as above.



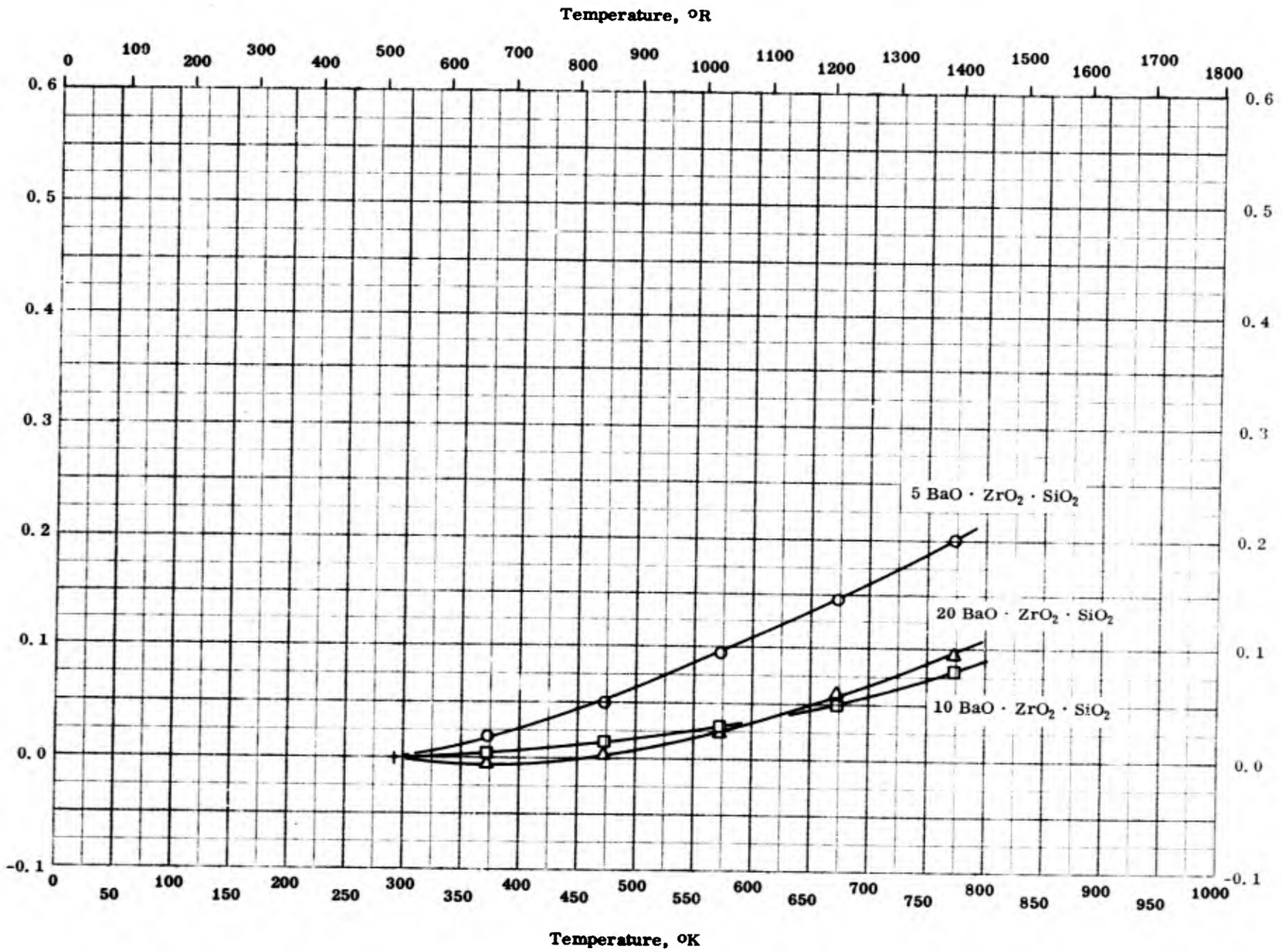
THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(91 - 94 vol % $Al_2O_3 \cdot TiO_2$; 5 - 8 vol % $\alpha - Al_2O_3$ inclusions)

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(91 - 94 vol % $Al_2O_3 \cdot TiO_2$; 5 - 8 vol % $\alpha - Al_2O_3$ inclusions)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	50-4	293-1173		92.8 vol % $Al_2O_3 \cdot TiO_2$ crystals and 7.2 vol % $\alpha - Al_2O_3$ inclusions; apparent porosity 30.1%.	Ignited γ Al_2O_3 (1 μ) and c.p. TiO_2 wet milled, dried, temporary wax binder added, screened (50 mesh), pressed (10,000 lb in.$^{-2}$), fired in 8 hrs to 650 C, fired in 26 hrs to 1820 C, held 1 hr, furnace cooled.
□	50-4	293-1173		92.0 vol % $Al_2O_3 \cdot TiO_2$ crystals and 8.0 vol % $\alpha - Al_2O_3$ inclusions; apparent porosity 27.5%.	Same as above.
△	50-4	293-1173		91.7 vol % $Al_2O_3 \cdot TiO_2$ crystals, 7.3 vol % $\alpha - Al_2O_3$ inclusions, and 1% mineral impurities; apparent porosity 26.8%.	Fused Al_2O_3 (6 μ) and c.p. TiO_2 treated as above.
◇	50-4	293-1173		93.7 vol % $Al_2O_3 \cdot TiO_2$ crystals, 5.3 vol % $\alpha - Al_2O_3$ inclusions, and 1% mineral impurities; apparent porosity 22.3%.	Same as above.
▽	50-4	293-1173		91.1 vol % $Al_2O_3 \cdot TiO_2$ crystals, 7.9 vol % $\alpha - Al_2O_3$ inclusions, and 1.0% mineral impurities; apparent porosity 15.8%.	Same as above.

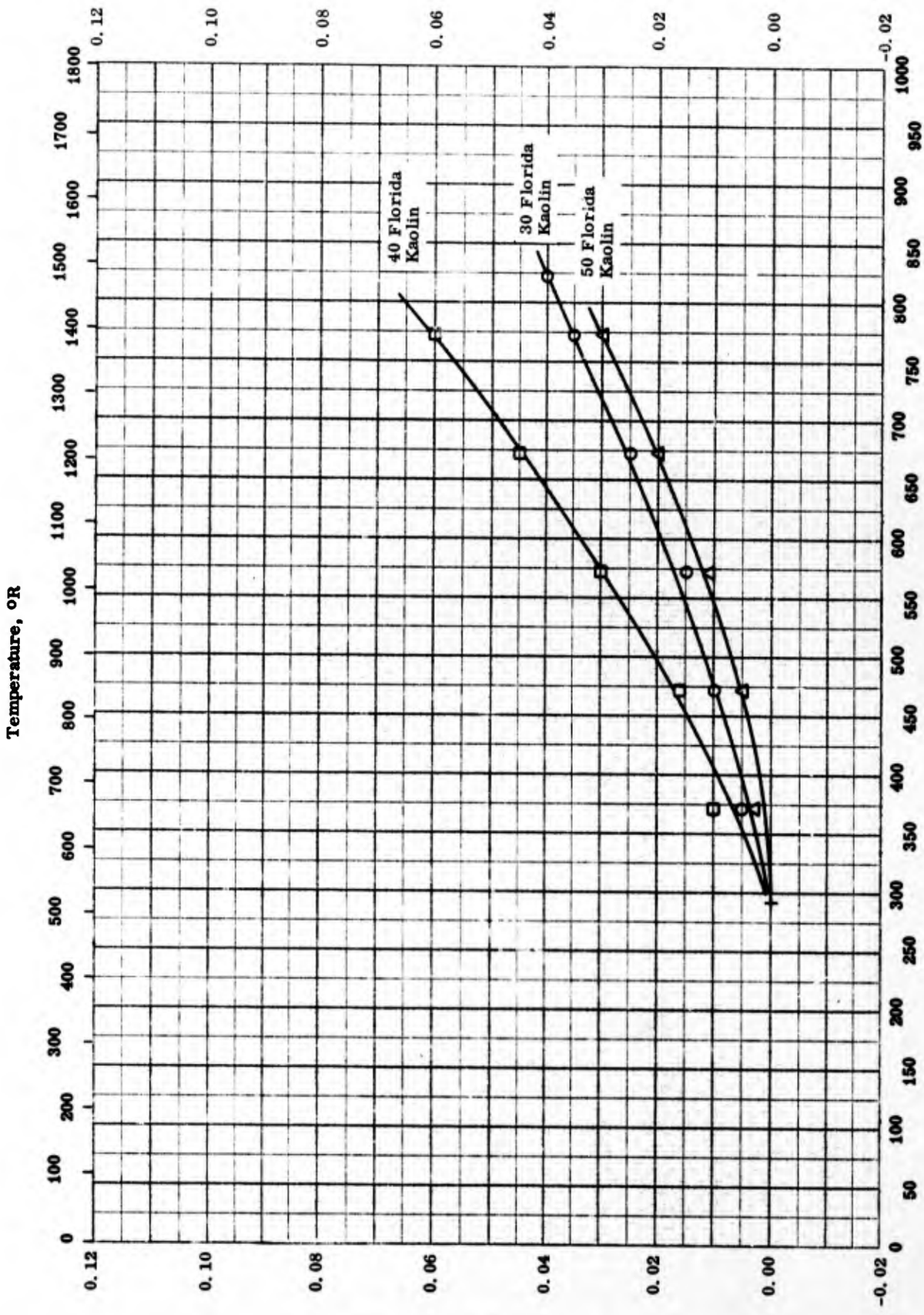


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With $BaO-ZrO_2-SiO_2$)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With $BaO-ZrO_2-SiO_2$)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-14	293-773		95 $Al_2O_3 \cdot TiO_2$ and 5 $BaO \cdot ZrO_2 \cdot SiO_2$.	
□	53-14	293-773		90 $Al_2O_3 \cdot TiO_2$ and 10 $BaO \cdot ZrO_2 \cdot SiO_2$.	
△	53-14	293-773		80 $Al_2O_3 \cdot TiO_2$ and 20 $BaO \cdot ZrO_2 \cdot SiO_2$.	

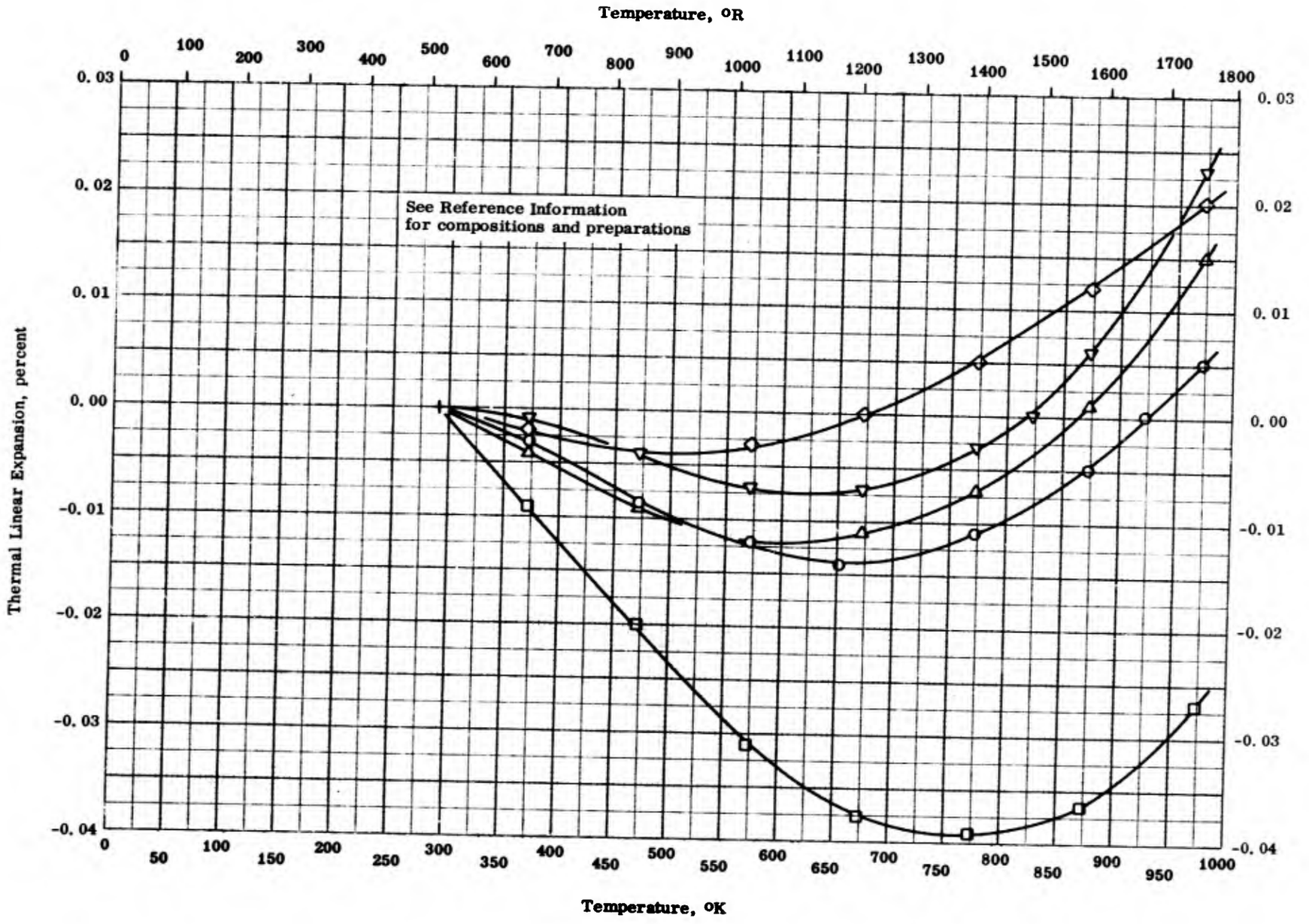


THERMAL LINEAR EXPANSION — VITREOUS BONDED ALUMINUM TITANATE
(With Florida kaolin)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With Florida kaolin)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-14	293-823		70 $Al_2O_3 \cdot TiO_2$ and 30 Florida kaolin.	
□	53-14	293-773		60 $Al_2O_3 \cdot TiO_2$ and 40 Florida kaolin.	
△	53-14	293-773		50 $Al_2O_3 \cdot TiO_2$ and 50 Florida kaolin.	

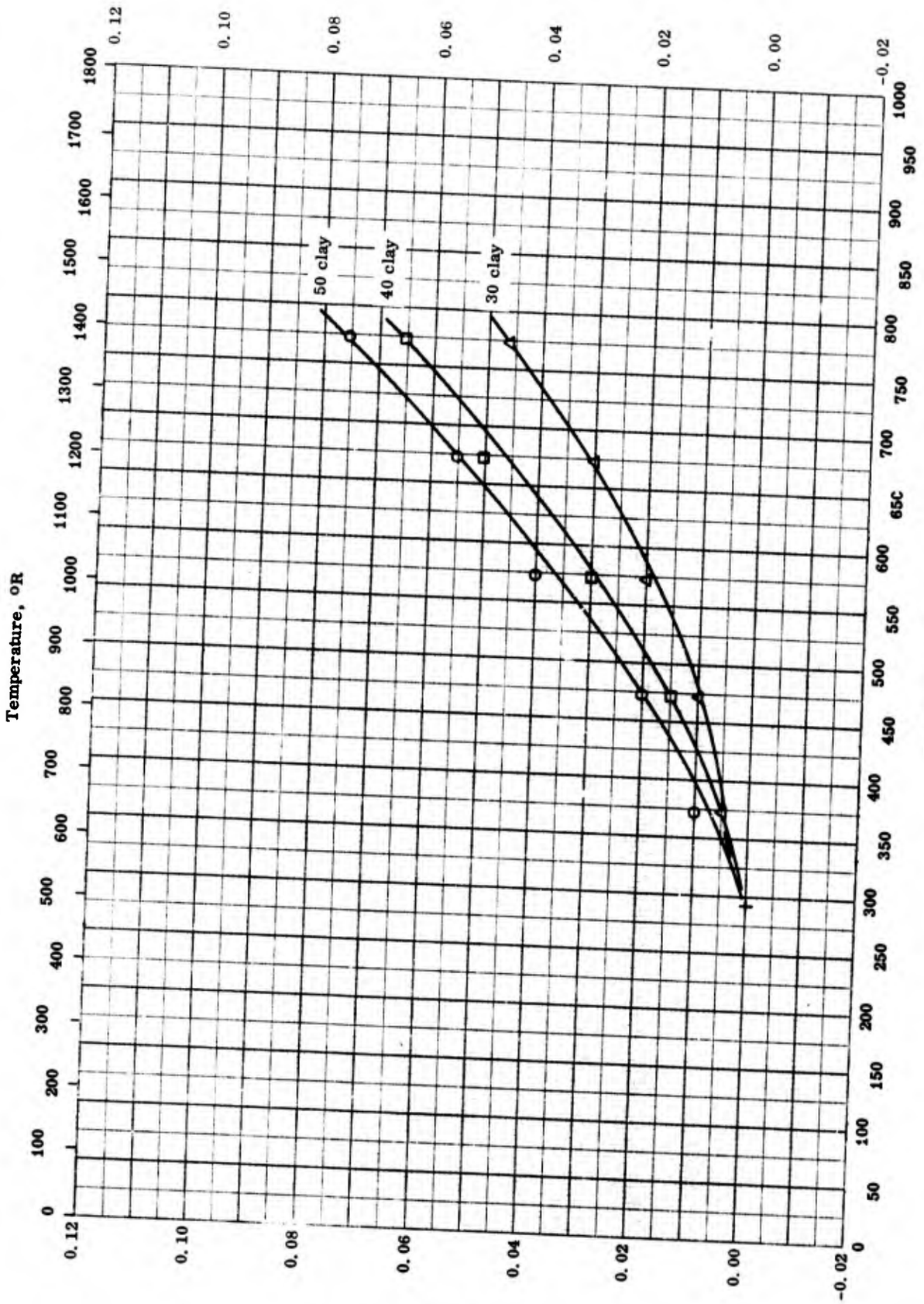


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With petalite and E. P. K. clay)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With petalite and E. P. K. clay)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-16	373-973		60 petalite and 40 $Al_2O_3 \cdot TiO_2$; prepared from petalite + Al_2O_3 + TiO_2 (equimolar mix).	Tested at 2 - 3 C min^{-1} rise.
□	55-16	373-973		Same as above; prepared from petalite + $Al_2O_3 \cdot TiO_2$.	Tested at 2 - 3 C min^{-1} rise; $Al_2O_3 \cdot TiO_2$ formed by pressing, firing to 2800 F, crushing, and grinding to 200 mesh.
△	55-16	373-973		50 petalite, 40 $Al_2O_3 \cdot TiO_2$ and 10 E. P. K. clay.	Same as above.
◇	55-16	373-973		40 petalite, 40 $Al_2O_3 \cdot TiO_2$, and 20 E. P. K. clay.	Same as above.
▽	55-16	373-973		45 petalite, 30 $Al_2O_3 \cdot TiO_2$, 7.5 E. P. K. clay, and 7.5 feldspar (Buckingham).	Same as above.

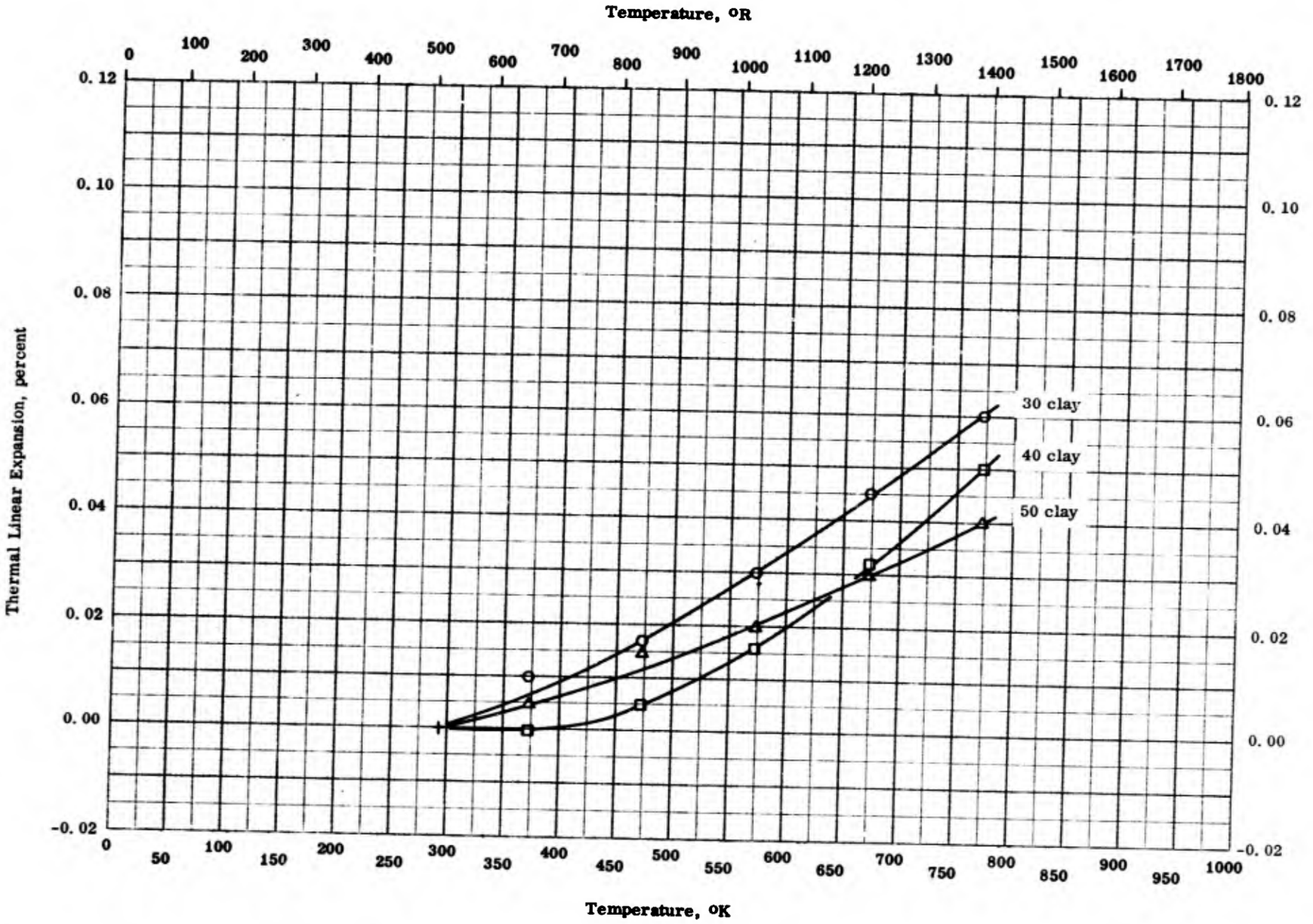


THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With Tennessee No. 5 ball clay)

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With Tennessee No. 5 ball clay)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-14	293-773		50 $Al_2O_3 \cdot TiO_2$ and 50 Tennessee No. 5 ball clay.	
□	53-14	293-773		60 $Al_2O_3 \cdot TiO_2$ and 40 Tennessee No. 5 ball clay.	
△	53-14	293-773		70 $Al_2O_3 \cdot TiO_2$ and 30 Tennessee No. 5 ball clay.	



THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With Fulton plastic clay)

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- VITREOUS BONDED ALUMINUM TITANATE
(With Fulton plastic clay)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-14	293-773		70 $Al_2O_3 \cdot TiO_2$ and 30 Fulton plastic clay.	
□	53-14	293-773		60 $Al_2O_3 \cdot TiO_2$ and 40 Fulton plastic clay.	
△	53-14	293-773		50 $Al_2O_3 \cdot TiO_2$ and 50 Fulton plastic clay.	

PROPERTIES OF ALUMINUM CLAD BORON CARBIDE
(Boral)

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	2.5	157

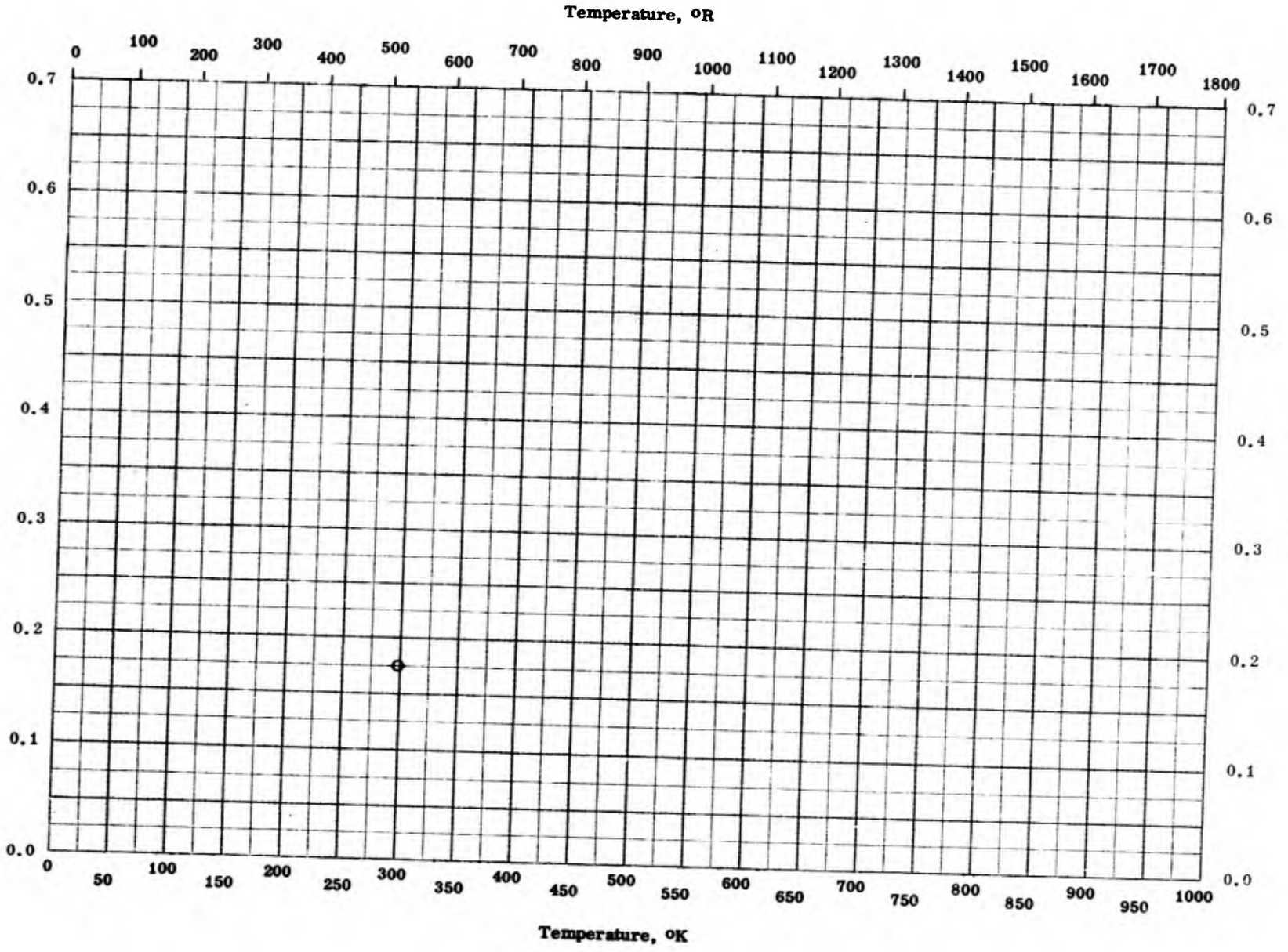
REPORTED VALUES

Density	g cm^{-3}	lb ft^{-3}
○ 55.1 Al	2.53	158
□ 75.4 Al	2.5	156

PROPERTIES OF ALUMINUM CLAD BORON CARBIDE
(Boral)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	54-12	298		Boral thermal neutron shield 1/4 in. thick sandwich of B_4C and Al powder between Al cladding; 55.1 Al, 36 B, and 8.9 C.	Hot rolled; density from weight and volume by water displacement.
□	54-5	298		Boral thermal neutron shield; 71.4 Al, 22.4 B, and 6.2 C.	Density by weight and volume.



SPECIFIC HEAT -- ALUMINUM CLAD BORON CARBIDE
(Boral)

SPECIFIC HEAT -- ALUMINUM CLAD BORON CARBIDE
(Boral)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	54-12	298		Boral thermal neutron shield: 1/4 in. thick sandwich of B_4C and Al powder between Al cladding; 50 Al, 50 B_4C by vol.; 57 lb ft^{-3} of Boron and 158 lb ft^{-3} of total material in finished sheet.	Soaked 1 hr at 1130 F; rolled at 1130 F; reheated between passes.

PROPERTIES OF MICA

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density	2.845	177.6

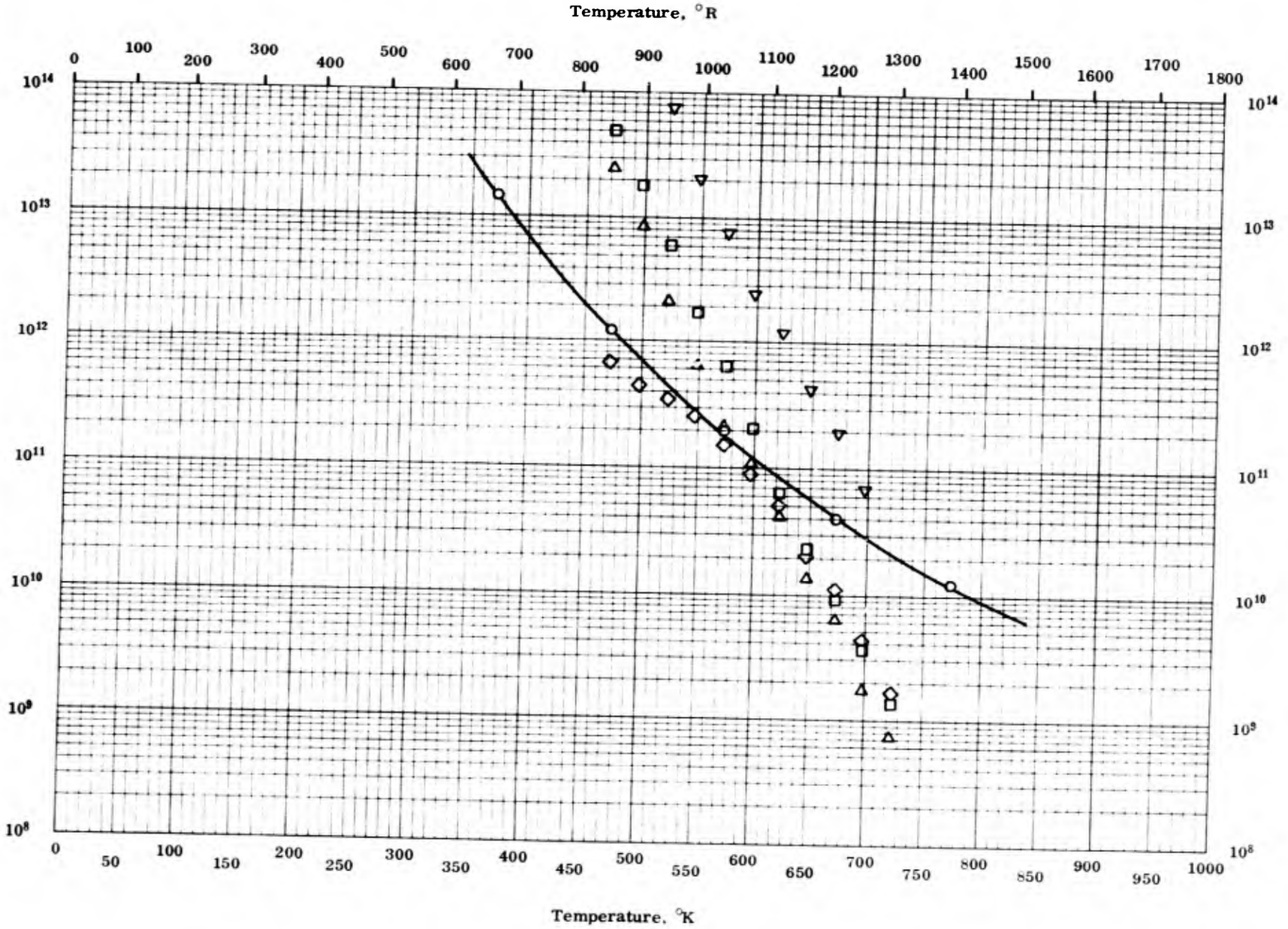
REPORTED VALUES

Density		g cm^{-3}	lb ft^{-3}
	O	2.845 ± 0.001	177.6 ± 0.06

PROPERTIES OF MICA

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-11	298		Mica.	Density by weight in air and in kerosene.



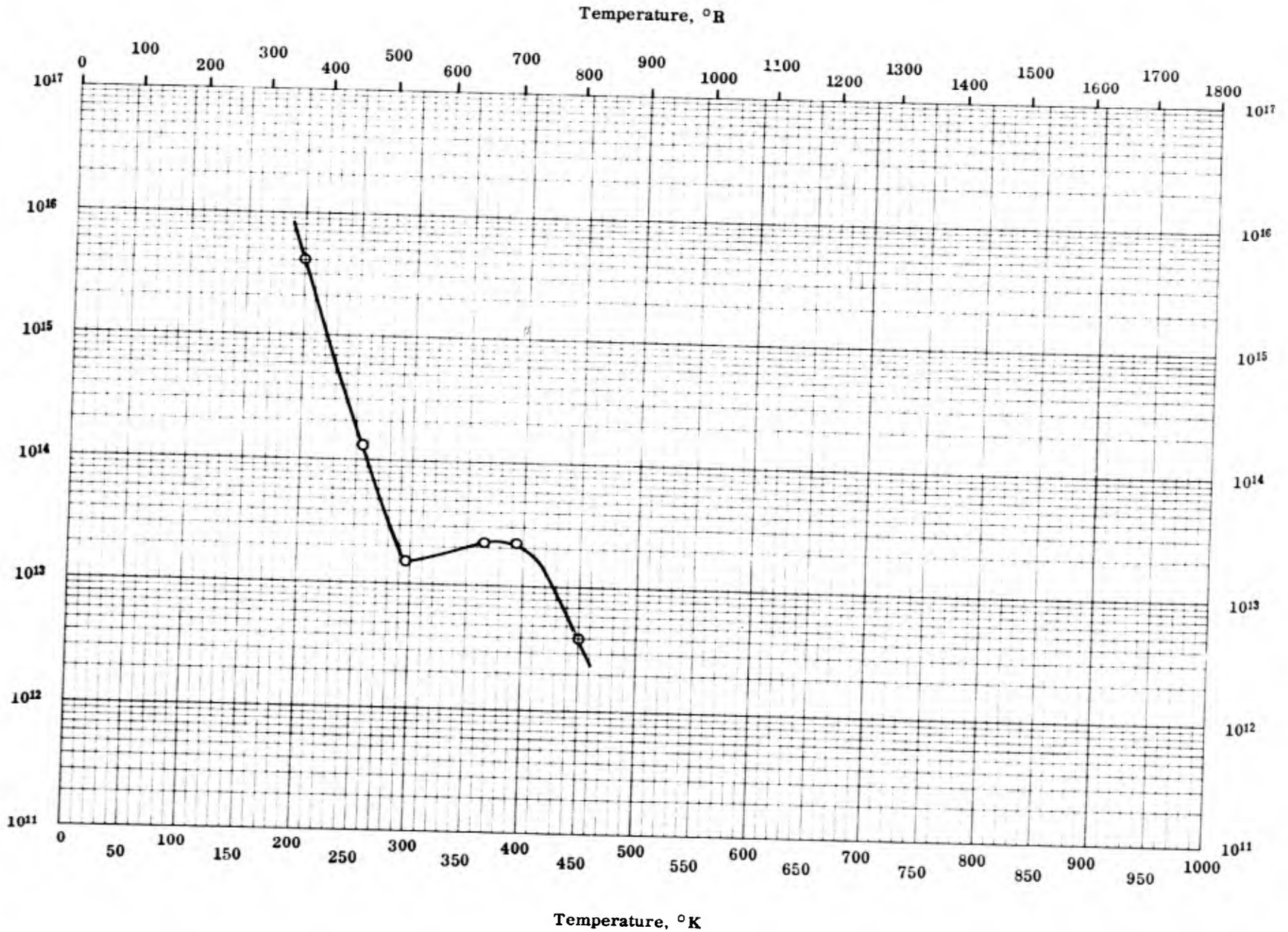
Electrical Resistivity, ohm cm

ELECTRICAL RESISTIVITY -- MICA

ELECTRICAL RESISTIVITY -- MICA

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-7	373-1073		High grade muscovite mica; thickness 0.002 - 0.017 in.	Cleaved and dried 24 hrs before test; polarity reversed every 2 min.
□	54-6	473-723		Synthetic barium mica; water absorption <0.1.	Hot pressed.
△	54-6	473-723		Same as above.	Same as above.
◇	54-6	473-723		Same as above.	Same as above.
▽	54-6	473-723		Same as above except water absorption 4.6%.	Same as above.

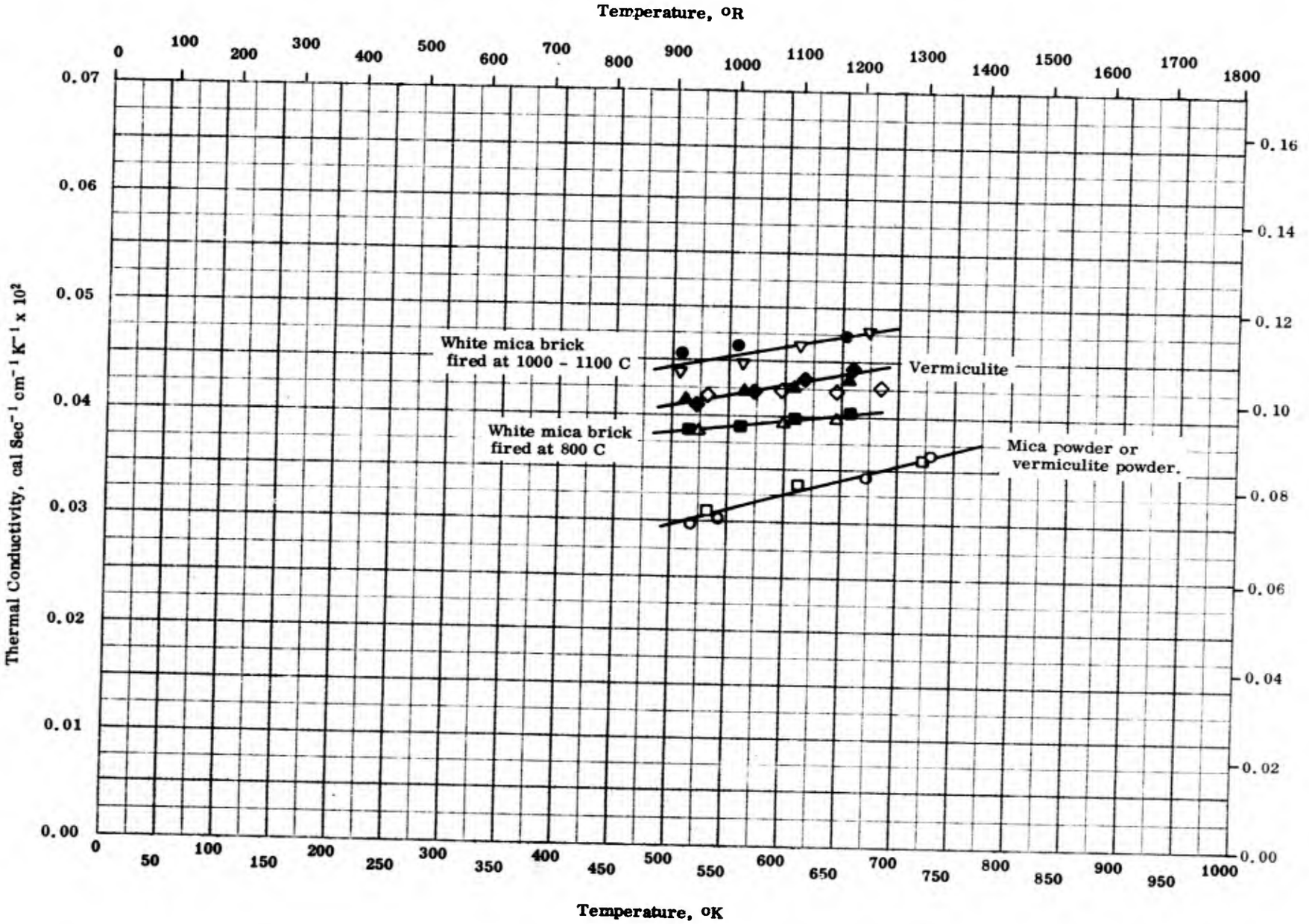


ELECTRICAL RESISTIVITY -- GLASS BONDED MICA

ELECTRICAL RESISTIVITY -- GLASS BONDED MICA

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-12	200-450		Supramica 557; glass bonded synthetic mica (Myacalex Corp. of America).	Conditioned 48 hrs at 120 F at 90% humidity, then 7 cycles, each of which consists of 12 hrs at 100 F and 100% humidity and 12 hrs at 120 F and 95% humidity.

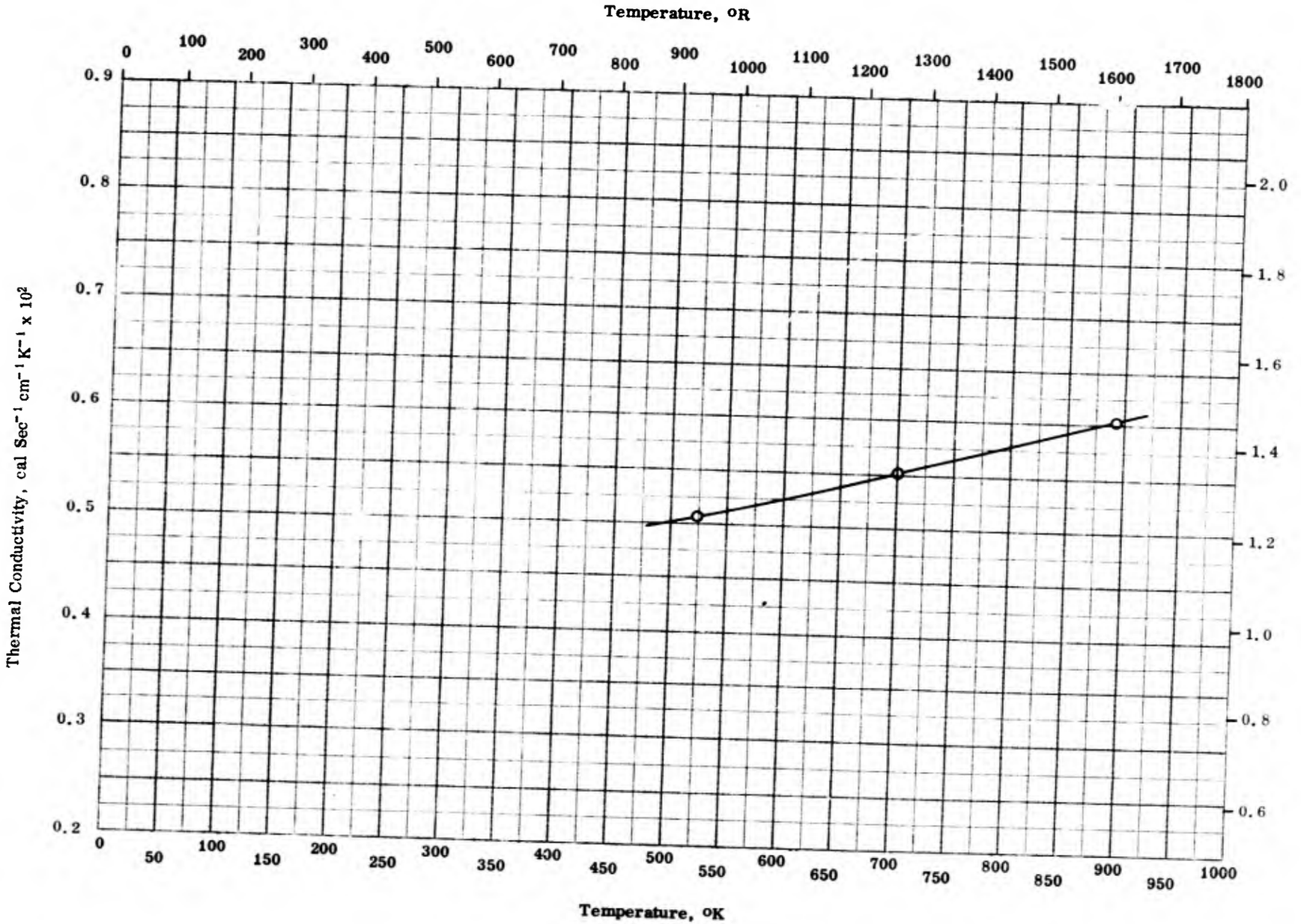


THERMAL CONDUCTIVITY -- MICA
(Powder and brick)

THERMAL CONDUCTIVITY -- MICA
(Powder and brick)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-9	518-729		Mica insulating powders; density 20.7 lb ft^{-3}.	
□	57-9	532-721		Vermiculite insulating powders; density 16.7 lb ft^{-3}.	
△	57-9	523-645		White mica brick; density 42.7 lb ft^{-3}.	Fired at 800 C.
◇	57-9	531-685		Same as above; density 41.2 lb ft^{-3}.	Fired at 900 C.
▽	57-9	506-673		Same as above; density 41.6 lb ft^{-3}.	Fired at 1000 C.
●	57-9	507-653		Same as above; density 41.6 lb ft^{-3}.	Fired at 1100 C.
■	57-9	516-659		White mica insulating brick; density 43.9 lb ft^{-3}.	
▲	57-9	512-656		Red mica insulating brick; density 44.0 lb ft^{-3}.	
◆	57-9	521-660		Vermiculite insulating brick; density 30.2 lb ft^{-3}.	

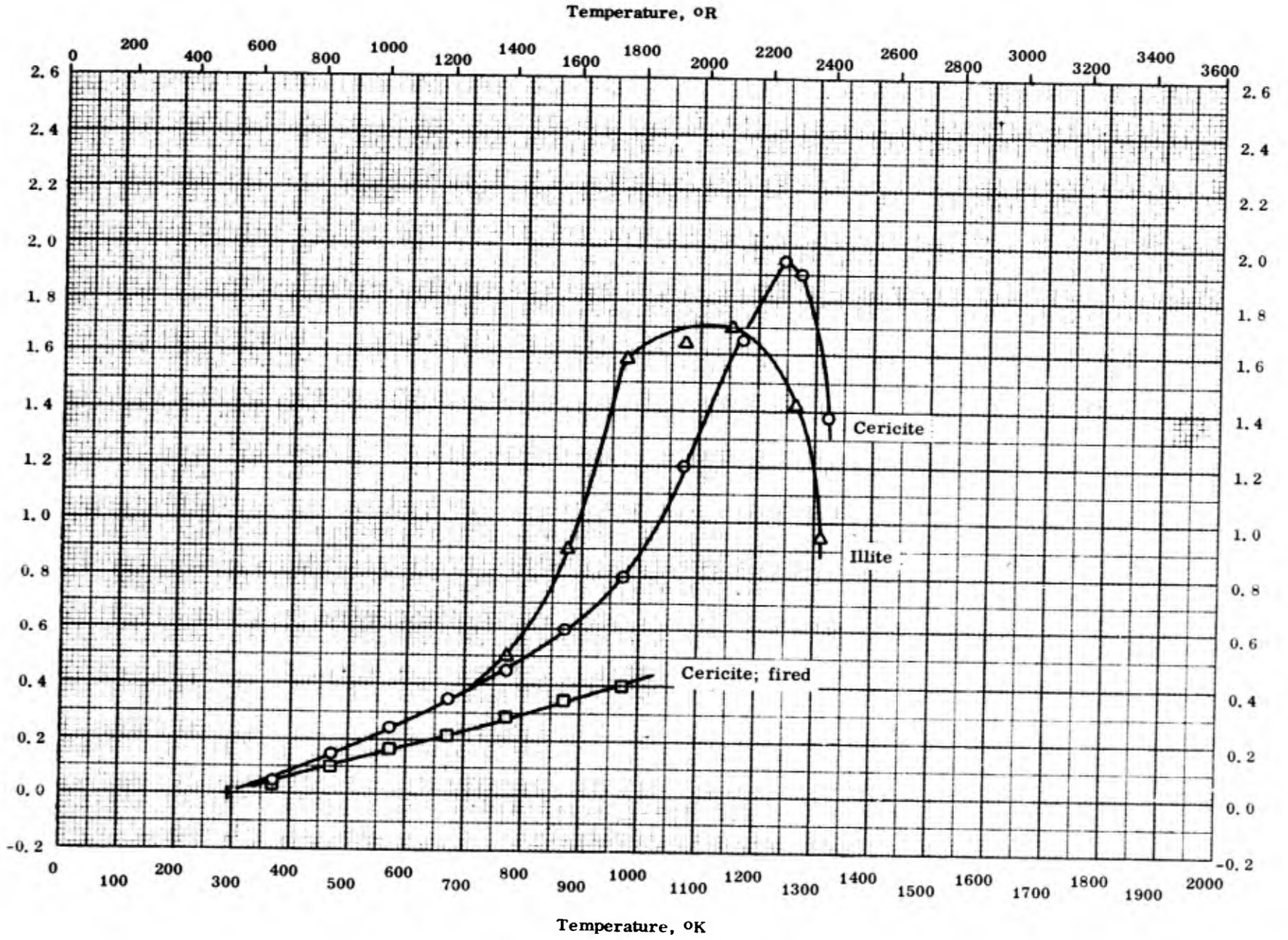


THERMAL CONDUCTIVITY -- SYNTHETIC MICA

THERMAL CONDUCTIVITY -- SYNTHETIC MICA

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-7	523-893		Density 98% of theoretical.	

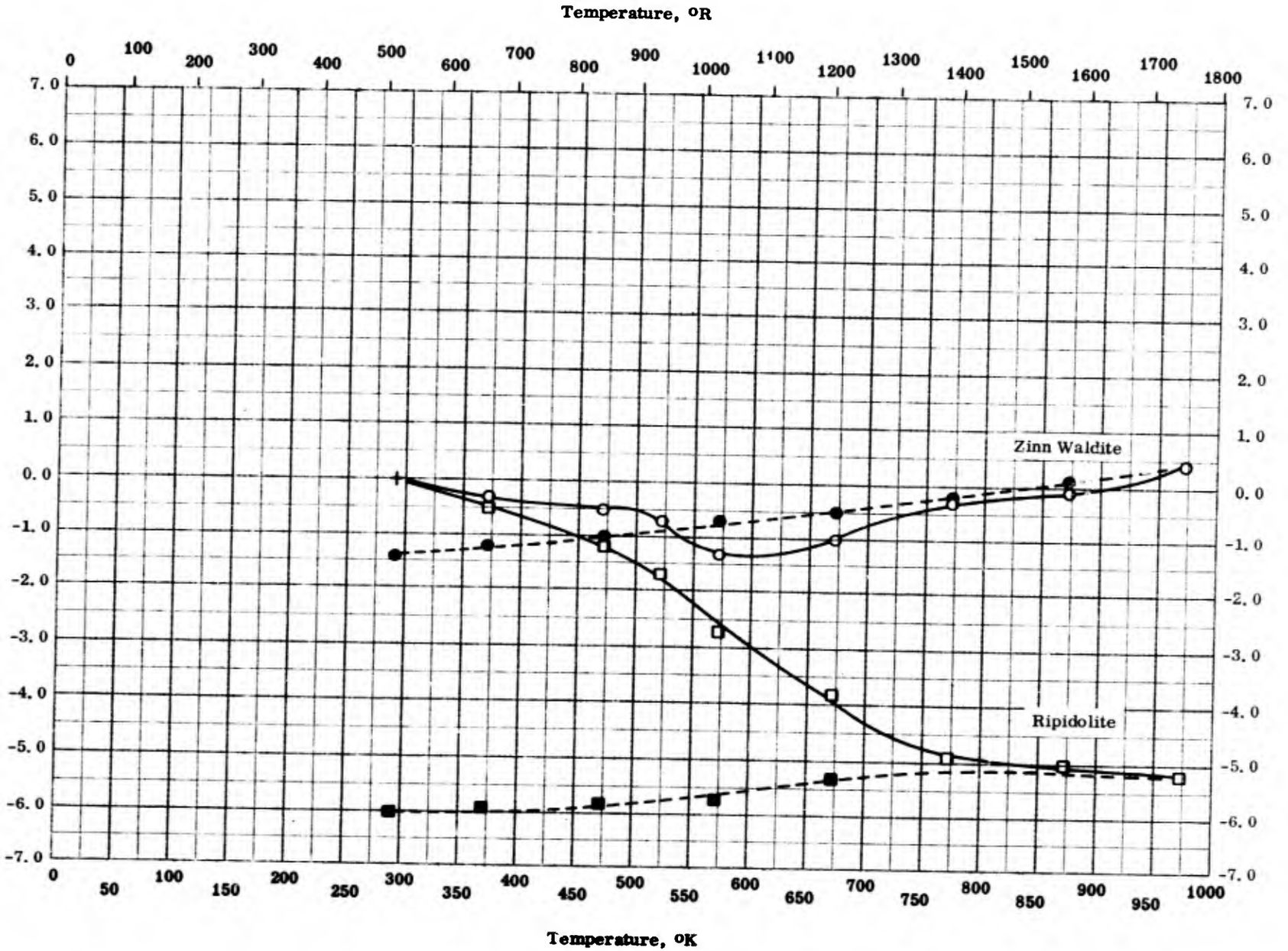


THERMAL LINEAR EXPANSION -- MICA
(Cericite and Illite)

THERMAL LINEAR EXPANSION -- MICA
(Cericite and Illite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-15	293-1323		Cericite; from LeBoulou Pyrenees Orientales; 50.74 SiO_2, 31.81 Al_2O_3, 10.27 K_2O, 1.27 Fe_2O_3, 0.58 CaO, 0.63 MgO, and 0.84 Na_2O.	Apparently random orientation.
□	55-15	293-973		Same as above; loss on firing 4.07%.	Same as above except fired.
△	55-15	293-1313		Illite.	Apparently random orientation.

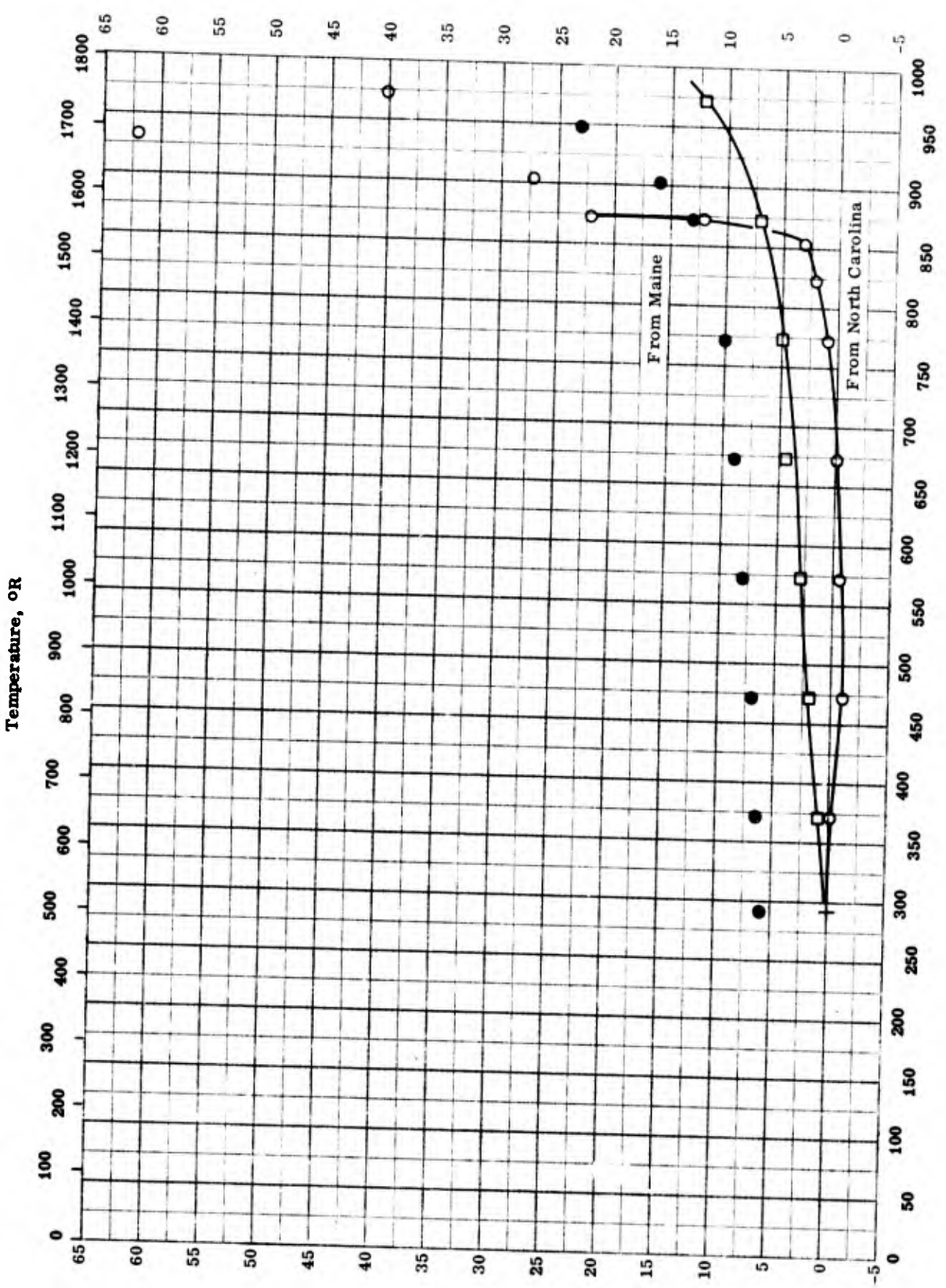


THERMAL LINEAR EXPANSION -- MICA
(Ripidolite and Zinn Waldite types)

THERMAL LINEAR EXPANSION -- MICA
(Ripidolite and Zinn Waldite types)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	45-5	293-973		Zinn Waldite type from Virginia.	Measurements perpendicular to cleavage plane; above data are representative; for additional information see original article; 1 hr at 700 C increased room temperature thickness as much as 60 % in some samples.
●	45-5	293-973		Same as above.	Cooling cycle for above sample.
□	45-5	293-973		Ripidolite type from Pennsylvania.	Measurements perpendicular to cleavage plane; same as above.
■	45-5	293-973		Same as above.	Cooling and reheating cycle for above sample.

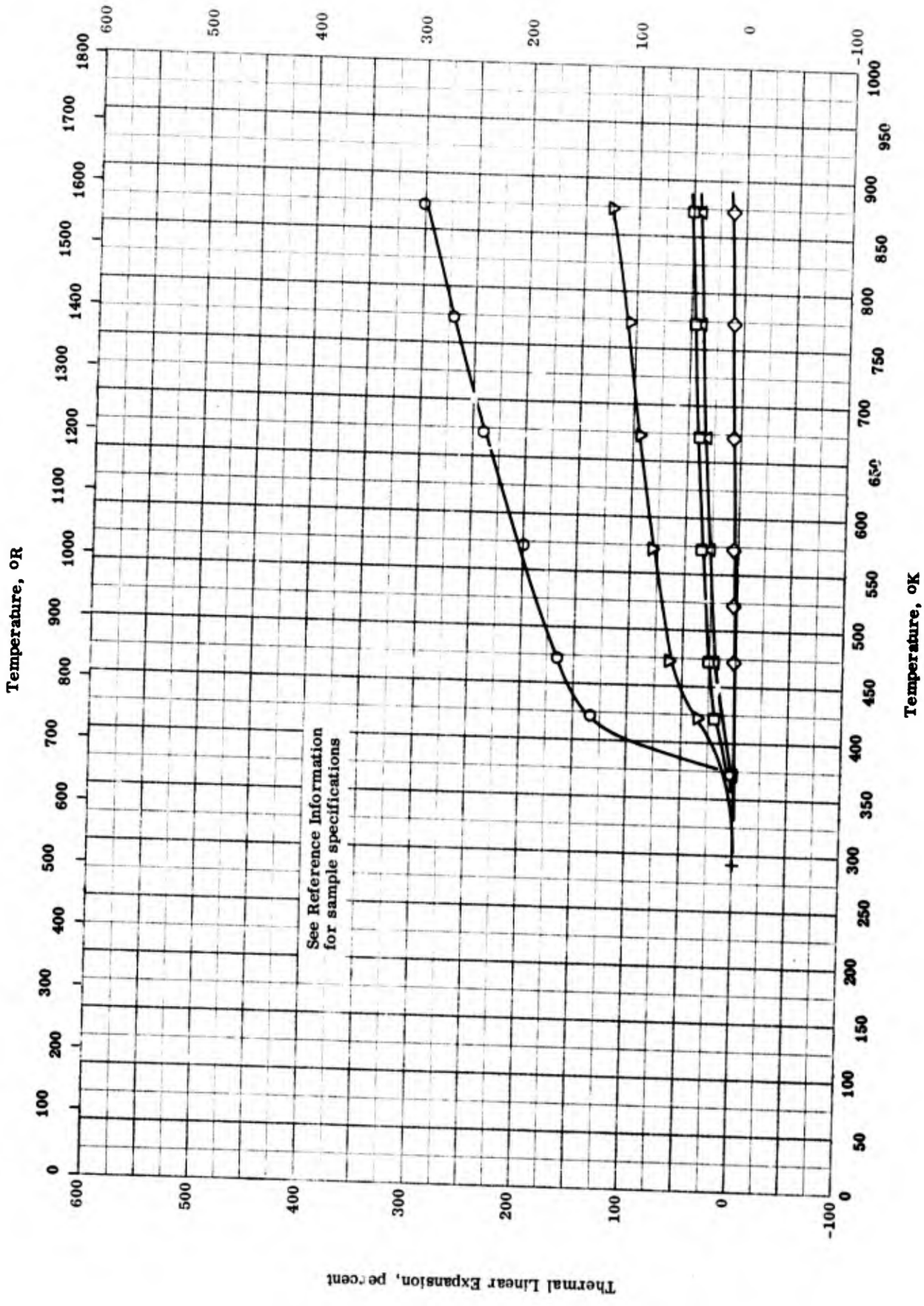


THERMAL LINEAR EXPANSION -- IRON MICA
(Biotite)

THERMAL LINEAR EXPANSION -- IRON MICA
(Biotite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	45-5	293-973		From Oxford County, Maine.	Measured perpendicular to cleavage plane; the data are representative; for additional information see original article; 1 hr at 700 C increased room temperature thickness as much as 60% in some samples.
●	45-5	293-973		Same as above.	Cooling cycle for above sample.
□	45-5	293-973		From Newdale, N.C.	Measured perpendicular to cleavage plane; 6th heating cycle; same as above.

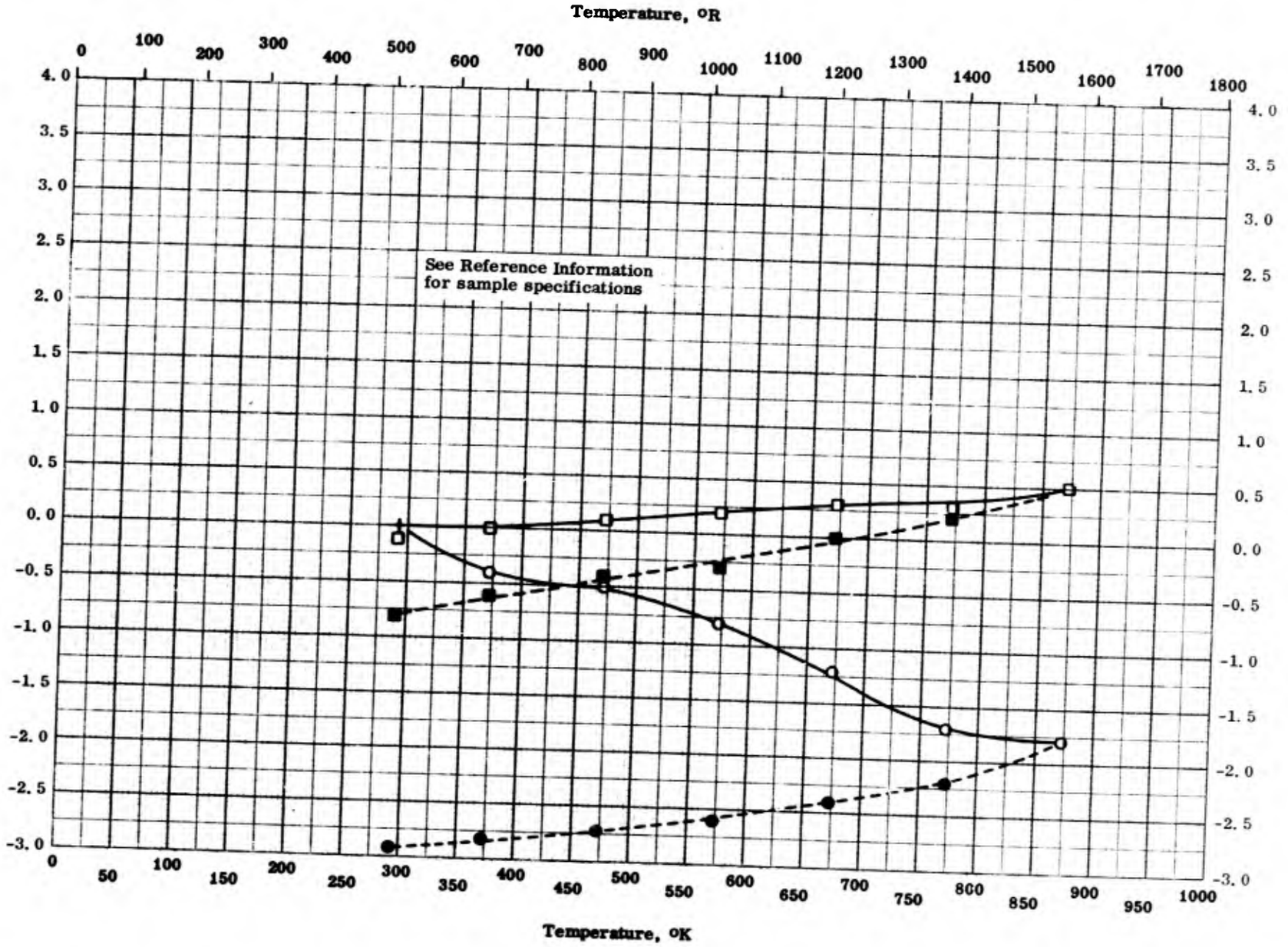


THERMAL LINEAR EXPANSION -- MAGNESIUM MICA
(Phlogophite)

THERMAL LINEAR EXPANSION -- MAGNESIUM MICA
(Phlogophite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	45-5	293-873		From Burgess, Canada.	Measured perpendicular to cleavage plane; 1 psi compressive load; the above data are representative; for additional information, see original article; 1 hr at 700 C increased room temperature thickness as much as 60% in some samples.
□	45-5	293-873		Same as above.	Same as above with 30 psi compressive load.
△	45-5	293-873		From Madagascar, Black No. 995.	Measured perpendicular to cleavage plane; formed from 80 disks; 3rd heating; same as above.
▽	45-5	293-873		From same sample as above.	Same as above; one solid disk; 1st heating.
◇	45-5	293-873		Same material as above.	Measured perpendicular to cleavage plane; same as above.



THERMAL LINEAR EXPANSION -- POTASSIUM MICA
(Muscovite)

THERMAL LINEAR EXPANSION -- POTASSIUM MICA
(Muscovite)

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	45-5	293-873		From Mitchell County, N.C.	Measurements perpendicular to cleavage plane; above data are representative; for additional information see original article; 1 hr at 700 C increased room temperature thickness as much as 60% in some samples.
●	45-5	293-873		Same as above.	Cooling cycle for above sample.
□	45-5	293-873		From Brazil, White 1441 (ruby, first quality).	Measurements perpendicular to cleavage plane; same as above.
■	45-5	293-873		Same as above.	The above specimen, cooling and reheating.

PROPERTIES OF PORCELAIN

MOST PROBABLE VALUES

Property	C.G.S. Units	Brit. Eng. Units
Density.	3.4*	210*

*Average value for engineering purposes.

REPORTED VALUES

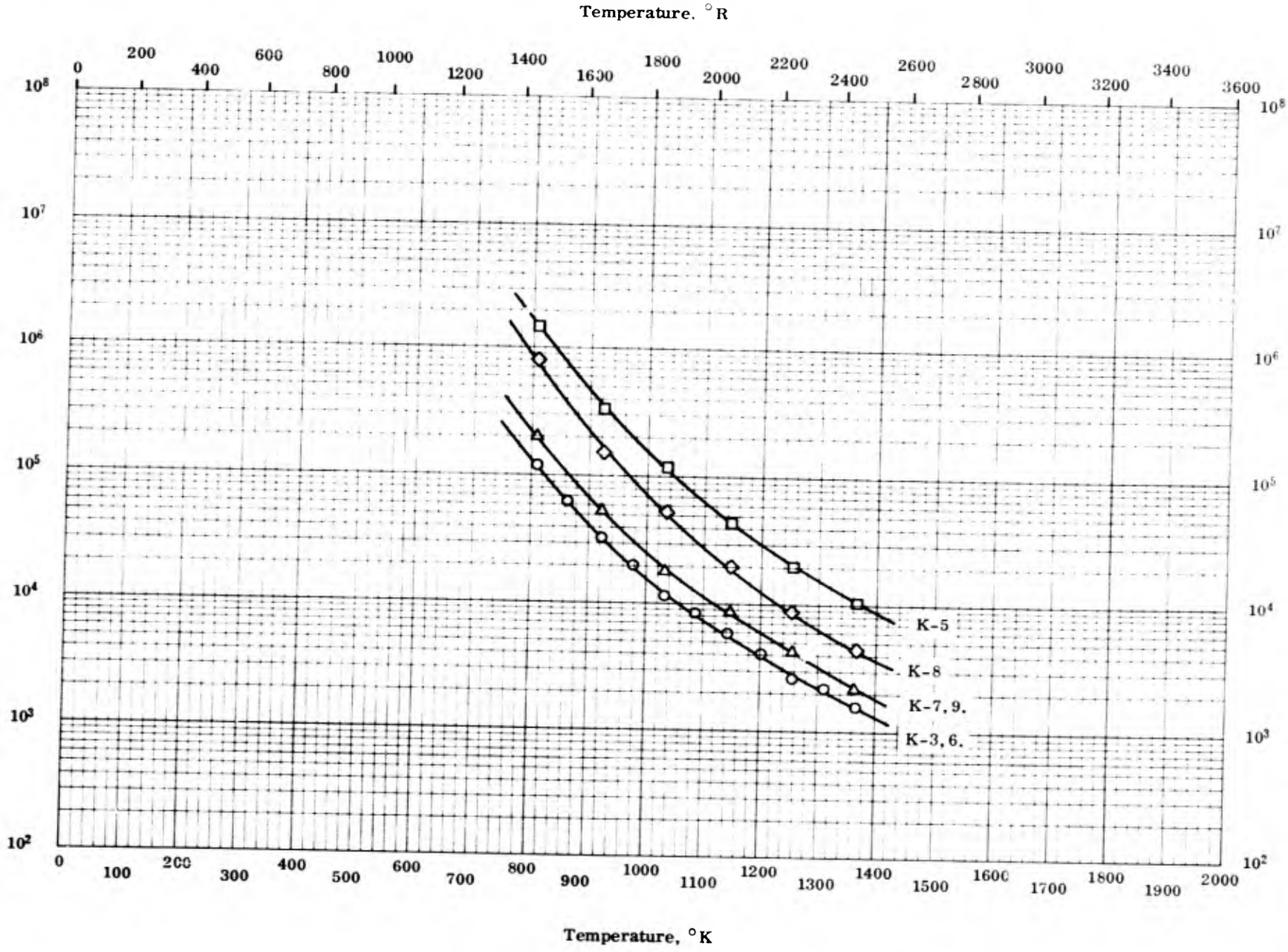
Density

	g cm^{-3}	lb ft^{-3}
○	3.41 ± 0.01	212.9 ± 0.6
□	2.90	181
△	2.87	179
◇	3.91	244
▽	3.68	230
●	3.76	235
■	3.68	230
▲	3.4	212

PROPERTIES OF PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-11	298		Porcelain 576.	Density from weight in air and in kerosene.
□	53-4	298		Type 4811 commercial BeO porcelain by Coo[illegible]ater absorption 0.09%.	
△	57-7	298		Mg titanate porcelain.	
◇	53-4	298		High zircon porcelain; 62.5 zircon G, 25 calcium zirconium silicate and 12.5 Old Mine No. 4 ball clay; water absorption 0.03%.	
▽	47-1	298		Westinghouse zircon porcelain.	
●	44-1	298		Low loss zircon porcelain (above average grade).	
■	44-1	298		Commercial low loss porcelain (average grade).	
▲	60-22	298		Al_2O_3 porcelain with 85 Al_2O_3.	

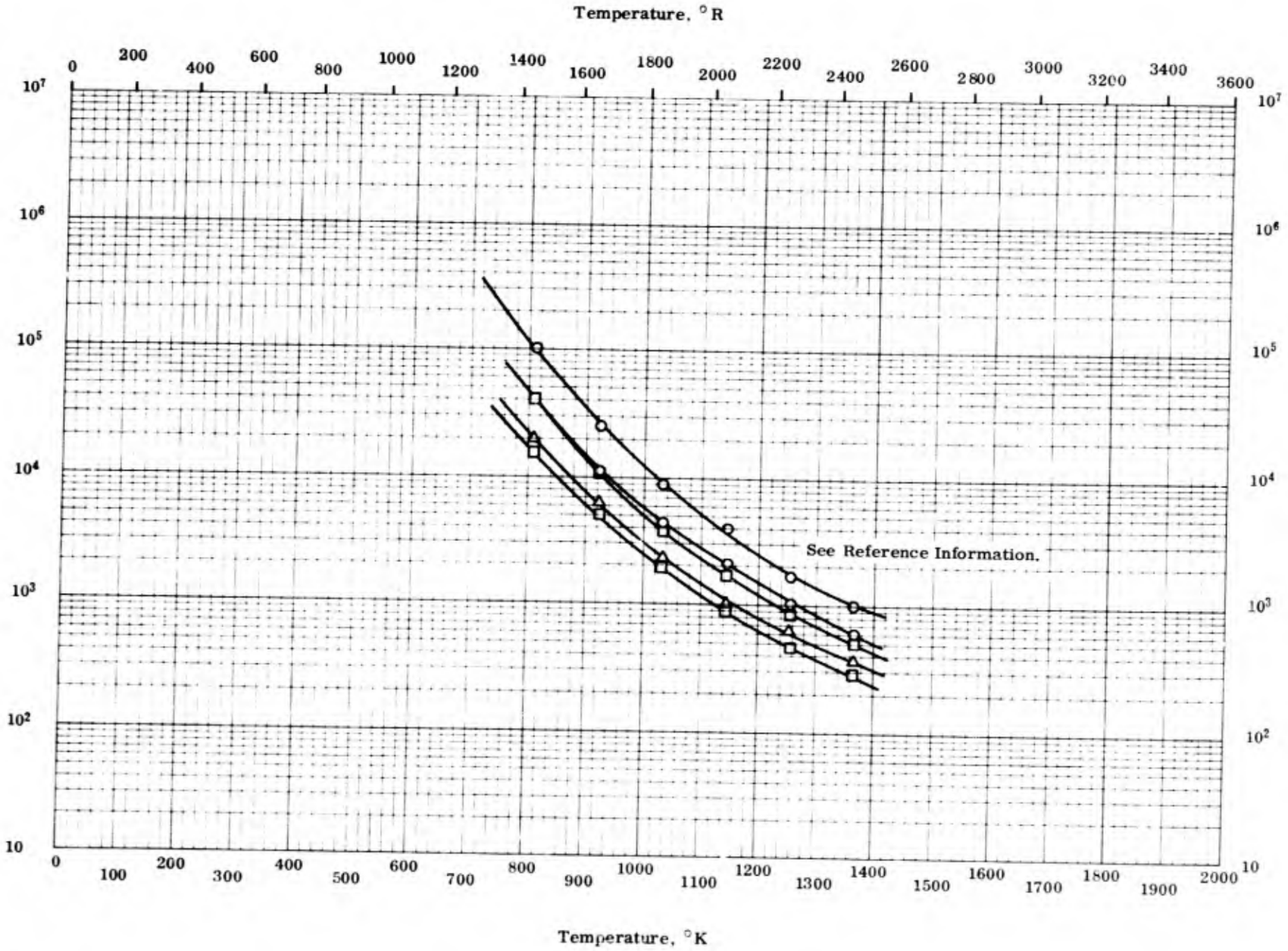


ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN

ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-13	811-1367		K-3 body; nominal: 60 Al_2O_3, 30 SiO_2, and 10 K_2O.	Fired at 2450 F.
○	57-13	811-1367		K-6 body; nominal: 45 SiO_2, 40 Al_2O_3, and 15 K_2O.	Fired at 2400 F; same resistivity as K-3 body.
□	57-13	811-1367		K-5 body; nominal: 75 Al_2O_3, 20 SiO_2, and 5 K_2O.	Fired at 2600 F.
△	57-13	811-1367		K-7 body; nominal: 48 SiO_2, 40 Al_2O_3, and 12 K_2O.	Fired at 2400 F.
△	57-13	811-1367		K-9 body; nominal: 45 Al_2O_3, 45 SiO_2, and 10 K_2O.	Fired at 2400 F; same resistivity as K-7 body.
◇	57-13	811-1367		K-8 body; nominal: 53 Al_2O_3, 40 SiO_2, and 7 K_2O.	Fired at 2450 F.

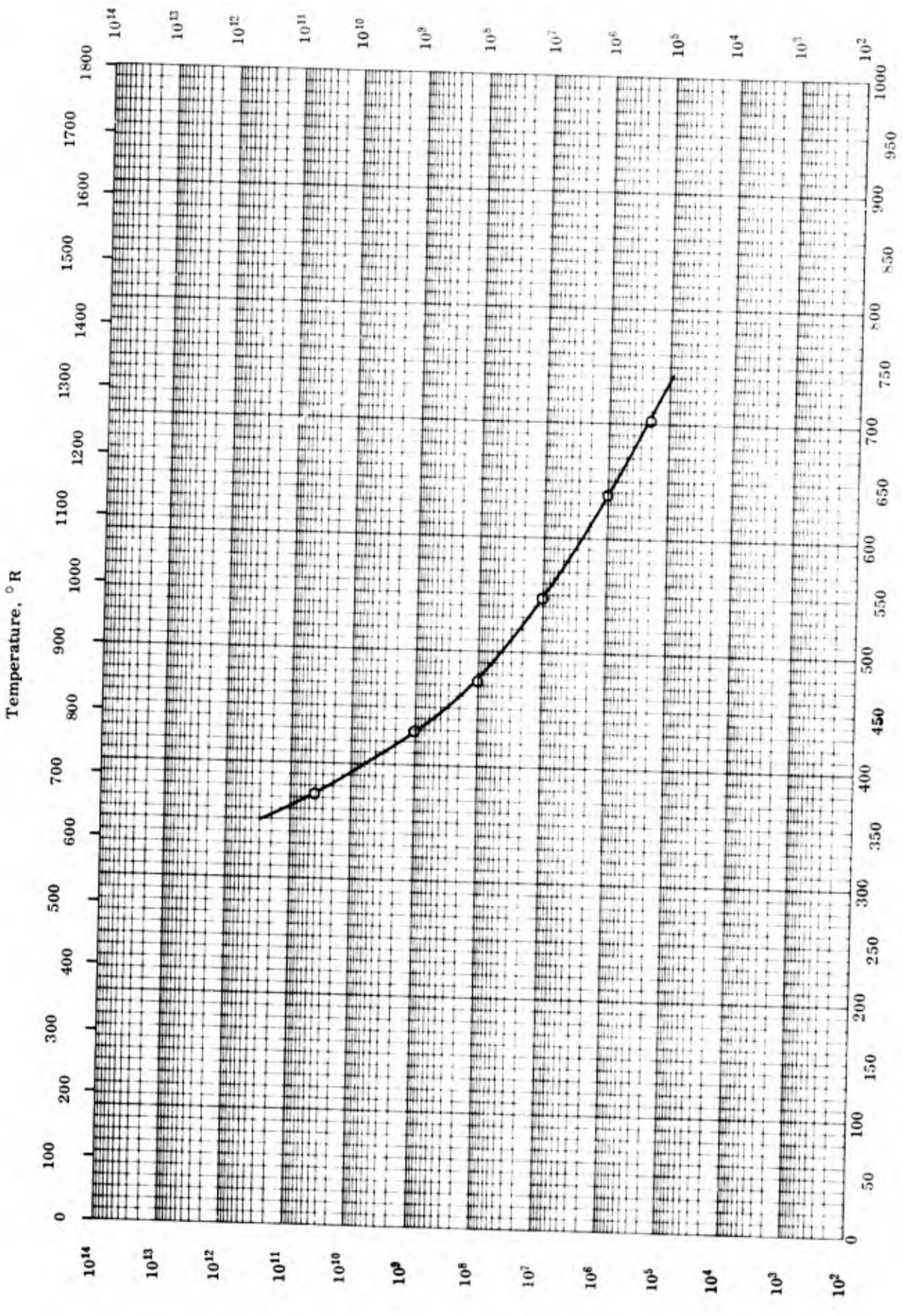


ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, LOW TENSION

ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, LOW TENSION

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-13	811-1367		Feldspar Porcelain: Dinnerware Cone 12 - 14; nominal: 73 - 76 SiO_2, 20 - 24 Al_2O_3, 2 - 4 $(K, Na)_2 O$, and balance (Ca, Mg) O.	Auth. reports range of values.
□	57-13	811-1367		Feldspar Porcelain; low tension electrical grade: nominal: 68 - 70 SiO_2, 23 - 27 Al_2O_3, 5 - 6 $(K, Na)_2 O$, and balance (Ca, Mg) O.	Auth. reports range of values.
△	57-13	811-1367		Porcelain, Cone 14; nominal: 76 SiO_2, 21 Al_2O_3, and 3 $(K, Na)_2 O$.	Fired at 2535 F.

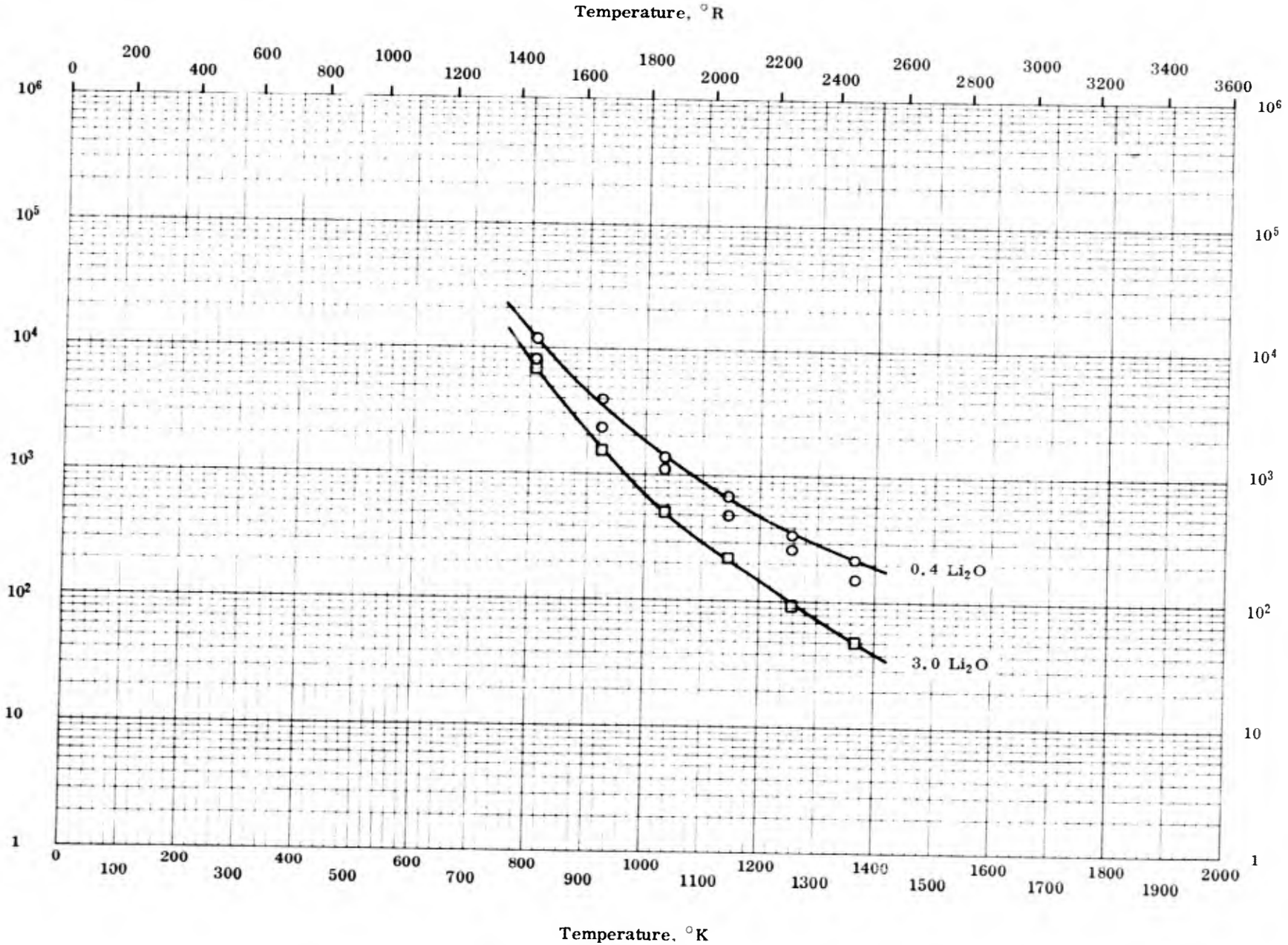


ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, HIGH TENSION

ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, HIGH TENSION

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	44-1	373-703		Commercial high-tension electrical porcelain; density 150 lb ft^{-3}.	

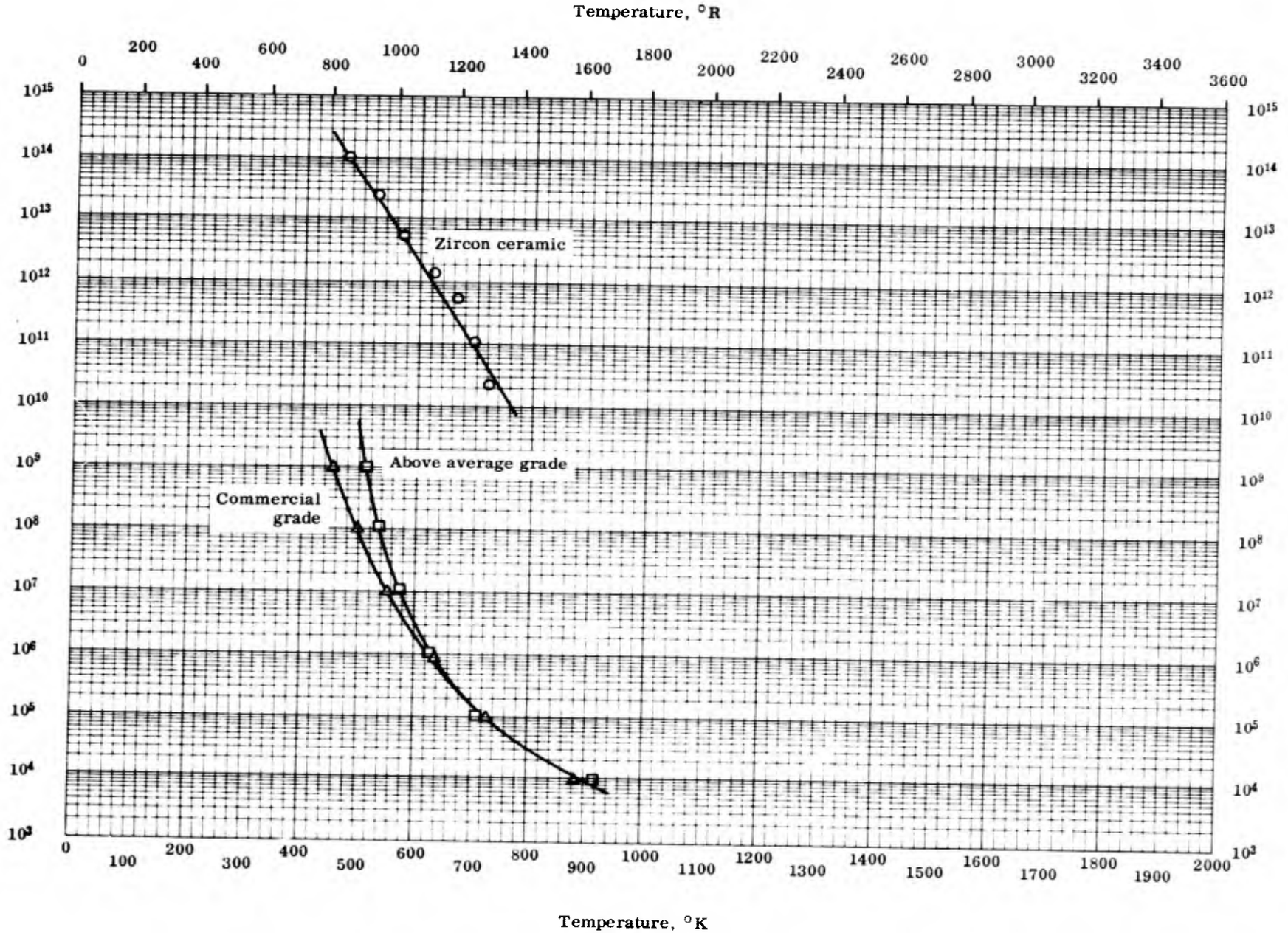


ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, LITHIUM MODIFIED

ELECTRICAL RESISTIVITY -- ELECTRICAL PORCELAIN, LITHIUM MODIFIED

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-13	811-1367		Li-K body series: 1, 2a, 2b, 2c, 2d, 2e; nominal range: 62.2 - 75.5 SiO_2, 21.6 - 35.5 Al_2O_3, 1.8 - 2.8 $(K, Na)_2O$, 0.4 - 0.7 Li_2O.	Fired at 2200 - 2550 F.
□	57-13	811-1367		Petalite body; nominal: 76.0 SiO_2, 21.0 Al_2O_3, 3.0 Li_2O; formed from 30 petalite and 50 clay.	Fired at 2400 F.

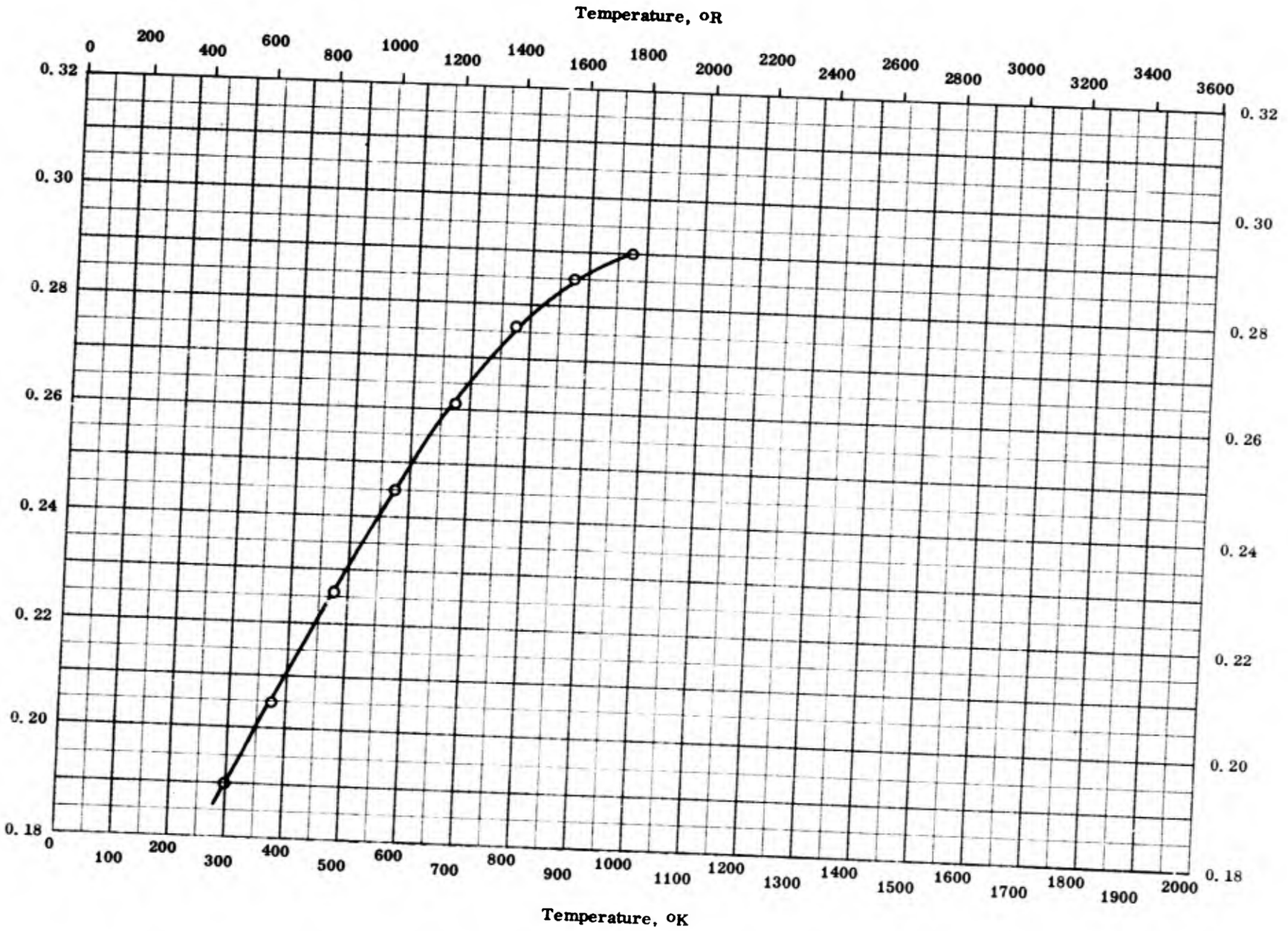


ELECTRICAL RESISTIVITY -- ZIRCON PORCELAIN

ELECTRICAL RESISTIVITY -- ZIRCON PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	54-6	473-723		12.52 zircon, 30.0 CaZr silicate, 12.5 BaZr silicate, 7.5 MgZr silicate, 20 Old Mine No. 4 clay, and 17.5 EPK.	
□	44-1	513-923		Low loss zircon porcelain (above avg. grade); density 235 lb ft^{-3}.	
△	44-1	453-883		Commercial low loss porcelain, avg. grade; density 230 lb ft^{-3}.	

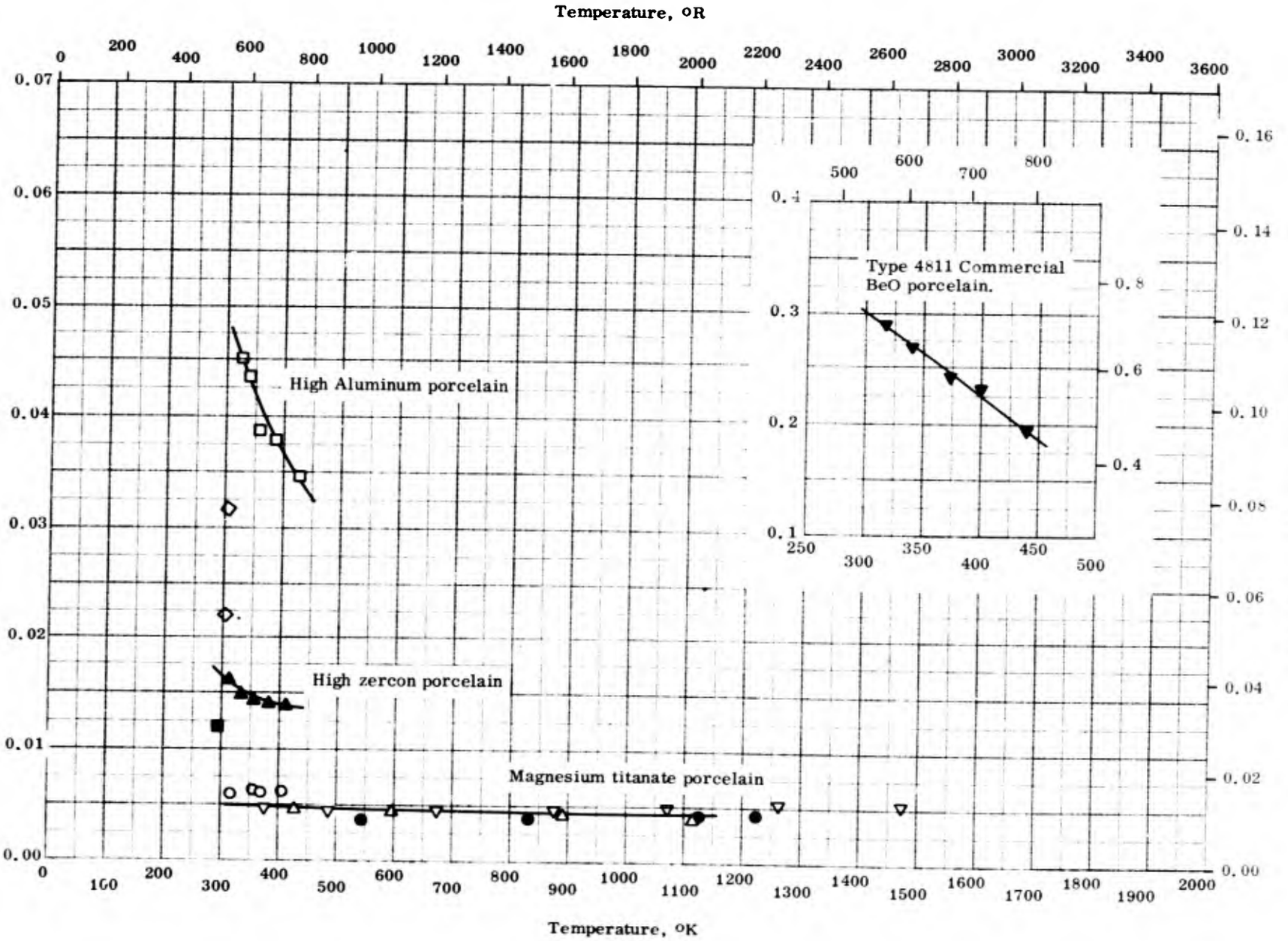


SPECIFIC HEAT -- HIGH ALUMINA PORCELAIN

SPECIFIC HEAT -- HIGH ALUMINA PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	63-21	298-973		High alumina porcelain ceramic.	



Thermal Conductivity, cal Sec^{-1} cm^{-1} K^{-1}

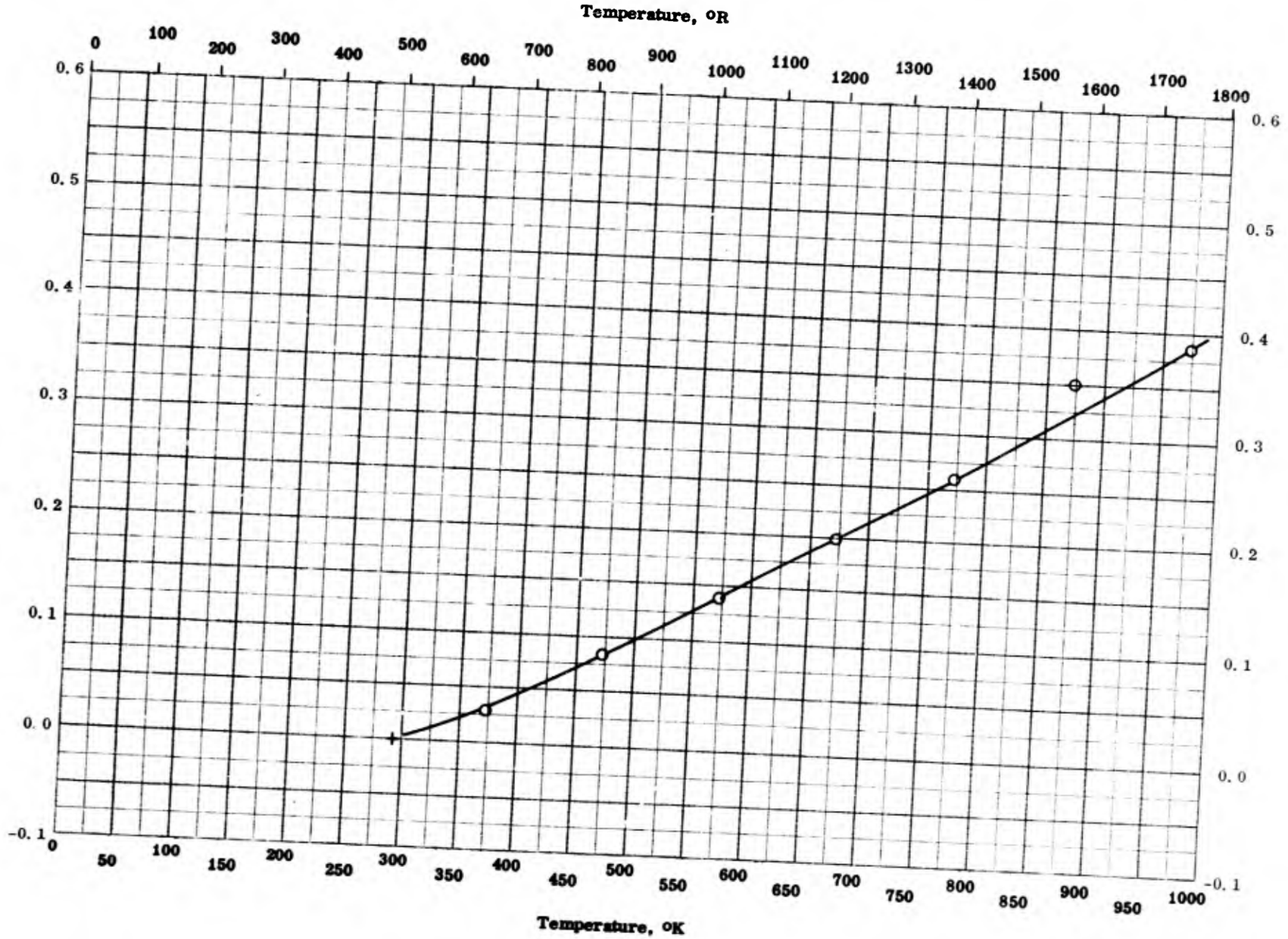
Thermal Conductivity, Btu hr^{-1} ft^{-1} R^{-1} x 10^{-2}

THERMAL CONDUCTIVITY -- VARIOUS PORCELAINS

THERMAL CONDUCTIVITY -- VARIOUS PORCELAINS

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	54-1	317-404		Wet process porcelain No. 7A2.	
□	53-4	322-425		High alumina porcelain.	Pt alloy glaze for ceramic-to-metal bond.
△	57-7	428-1113		Mg titanate porcelain; density 2.87 g cm^{-3}.	
◇	57-11	303		Porcelain 576.	
▽	54-2	262-1473		Electrical porcelain: 37.0 Oxford feldspar, 22.0 Edgar Nocarb clay, 19.0 flint, 15.0 Kentucky Old Mine No. 4 ball clay, 7.0 Edgar plastic kaolin.	Ball milled 15 hrs; slip cast, fired at 1250 C to zero apparent porosity.
●	57-6	548-1198		Electrical porcelain.	Data of low accuracy.
▲	53-4	311-411		High zircon porcelain; 62.5 zircon G, 25 calcium zirconium silicate, 12.5 Old Mine No. 4 ball clay; density 244 lb ft^{-3}; Water absorption 0.03%.	
■	47-1	298		Westinghouse zircon porcelain; density 230 lb ft^{-3}.	
▼	53-4	317-439		Type 4811 commercial BeO porcelain by Coors; density 181 lb ft^{-3} and water absorption 0.09%.	



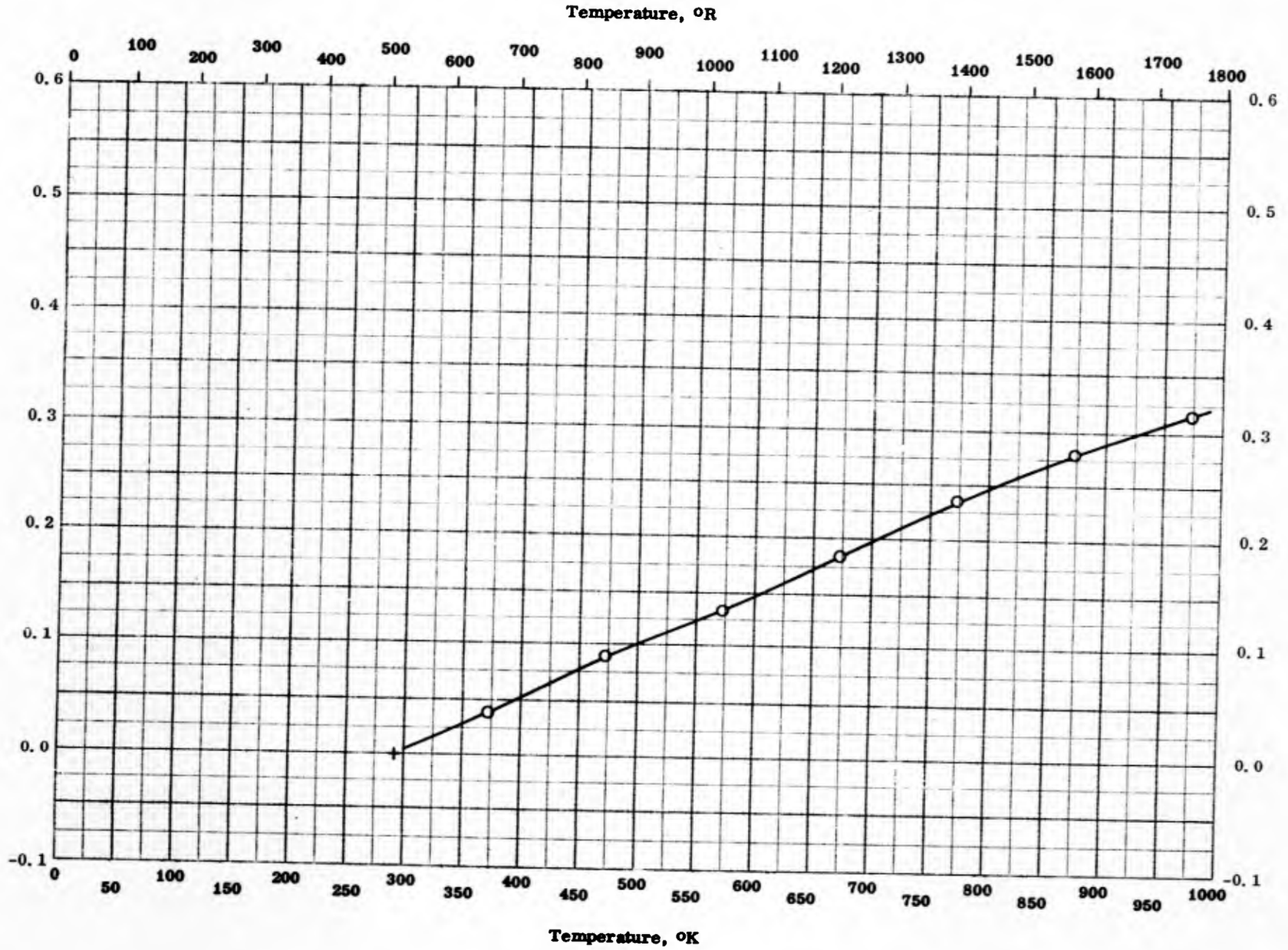
THERMAL LINEAR EXPANSION -- ELECTRICAL PORCELAIN

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- ELECTRICAL PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	52-9	293-973		Not given.	

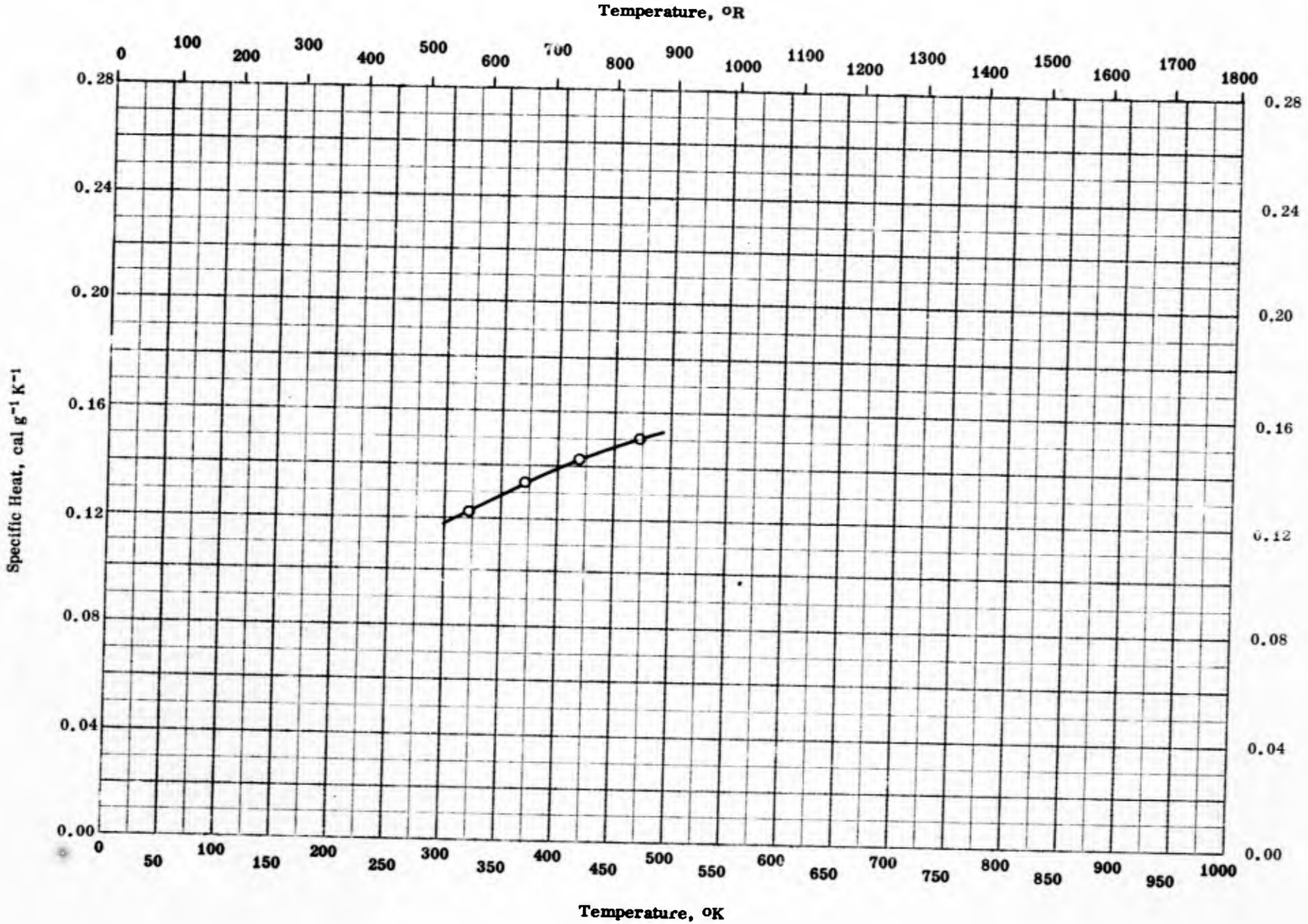


THERMAL LINEAR EXPANSION -- ZIRCON PORCELAIN

THERMAL LINEAR EXPANSION -- ZIRCON PORCELAIN

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	47-1	293-973		Westinghouse Zircon Porcelain; density 230 lb ft^{-3}.	

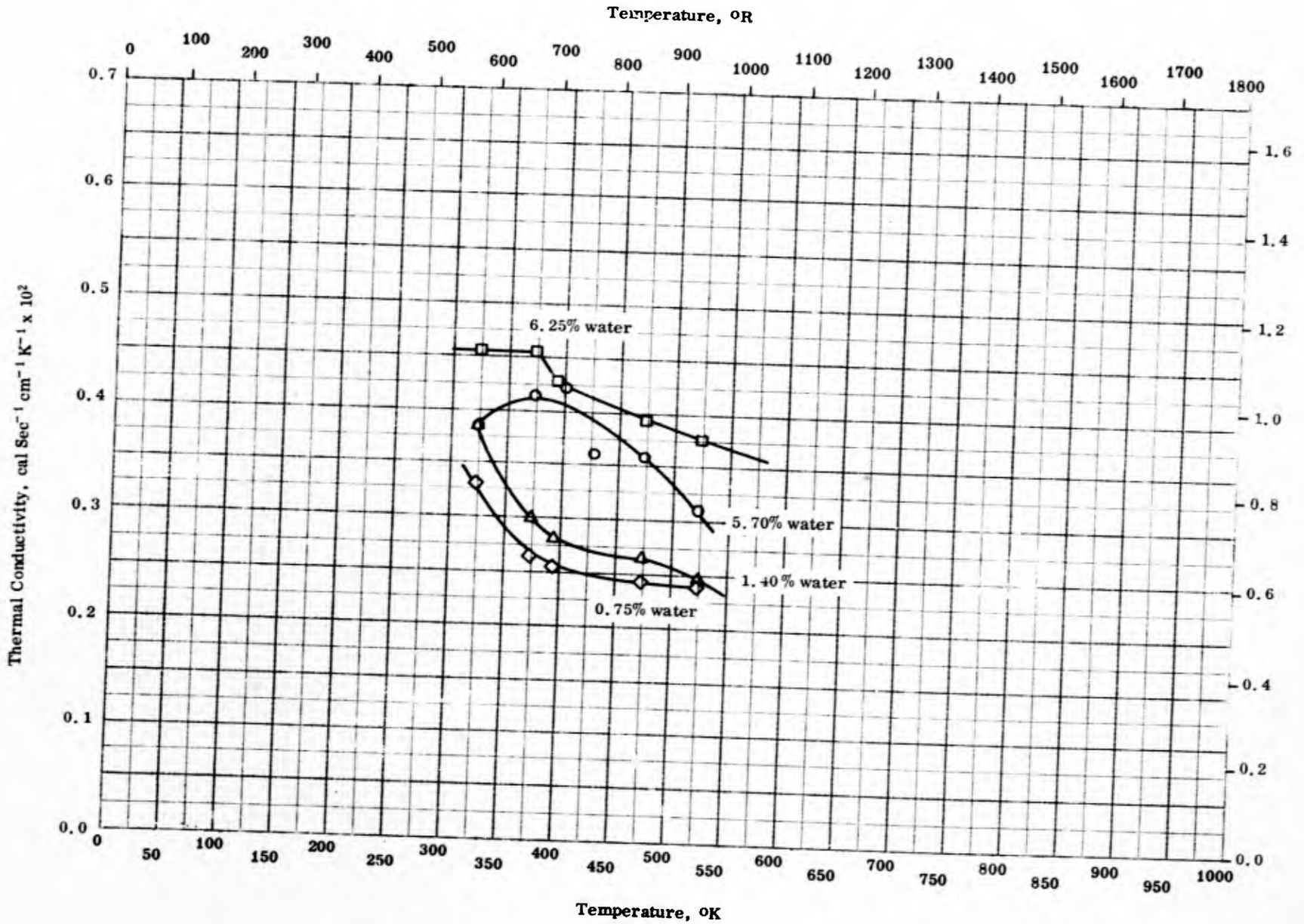


SPECIFIC HEAT - PORTLAND CEMENT - BARYTES AGGREGATE

SPECIFIC HEAT -- PORTLAND CEMENT - BARYTES AGGREGATE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-6	323-473		48.1 of 1-in. Sweetwater barytes; 41.9 of 3/8-in.; sweetwater barytes; 10 Portland cement. (Sweetwater barytes contain 95.9 $BaSO_4$, 1.3 O_2, 1 Fe, 0.5 Ca); density 218 lb ft^{-3}.	

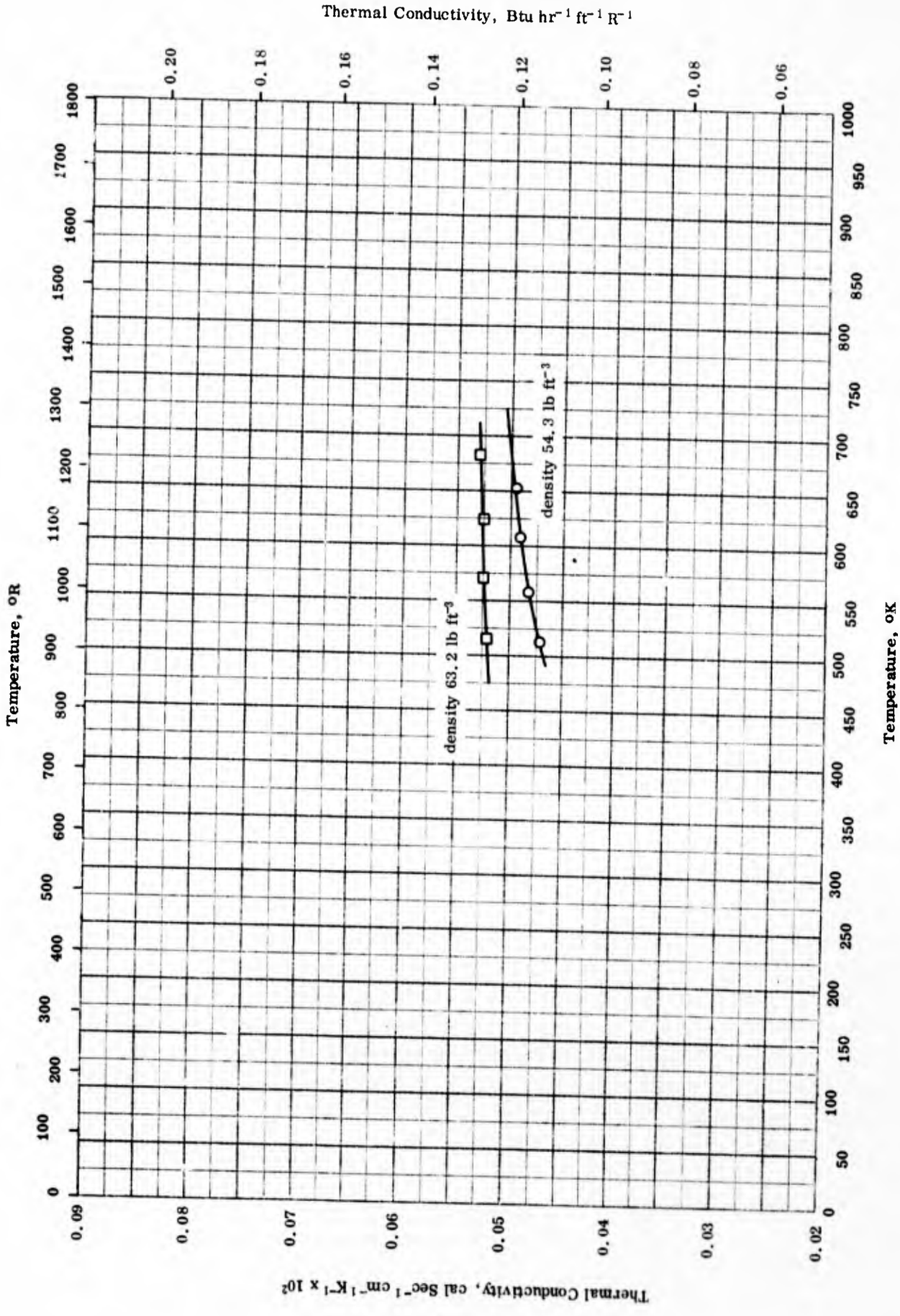


THERMAL CONDUCTIVITY -- PORTLAND CEMENT - BARYTES AGGREGATE

THERMAL CONDUCTIVITY -- PORTLAND CEMENT-BARYTES AGGREGATE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-6	323-523		Barytes concrete; dry ingredients for pouring: 48.1 one in. sweetwater barytes; 41.9 3/8 in. sweetwater barytes; 10 Portland cement (type I or II); dry ingredients for blocks: 91.4 1/2 in. sweetwater barytes; 8.6 Portland cement (type I or II); density 220 lb ft^{-3}; 1 in. barytes contain: 95.9 $BaSO_4$, 1 Fe, 1.3 O_2, 0.5 Ca; bulk density 162 lb ft^{-3}; 38% voids; 3/8 in barytes contain: 81.6 $BaSO_4$, 9.8 Fe, 6.2 O_2, 0.9 Ca; bulk density 159 lb ft^{-3}; 35% voids; sample with 5.70% water (normal).	
□	53-6	323-523		Same as above except 6.25% water.	
△	53-6	323-523		Same as above except 1.40% water.	
◇	53-6	323-523		Same as above except 0.75% water.	

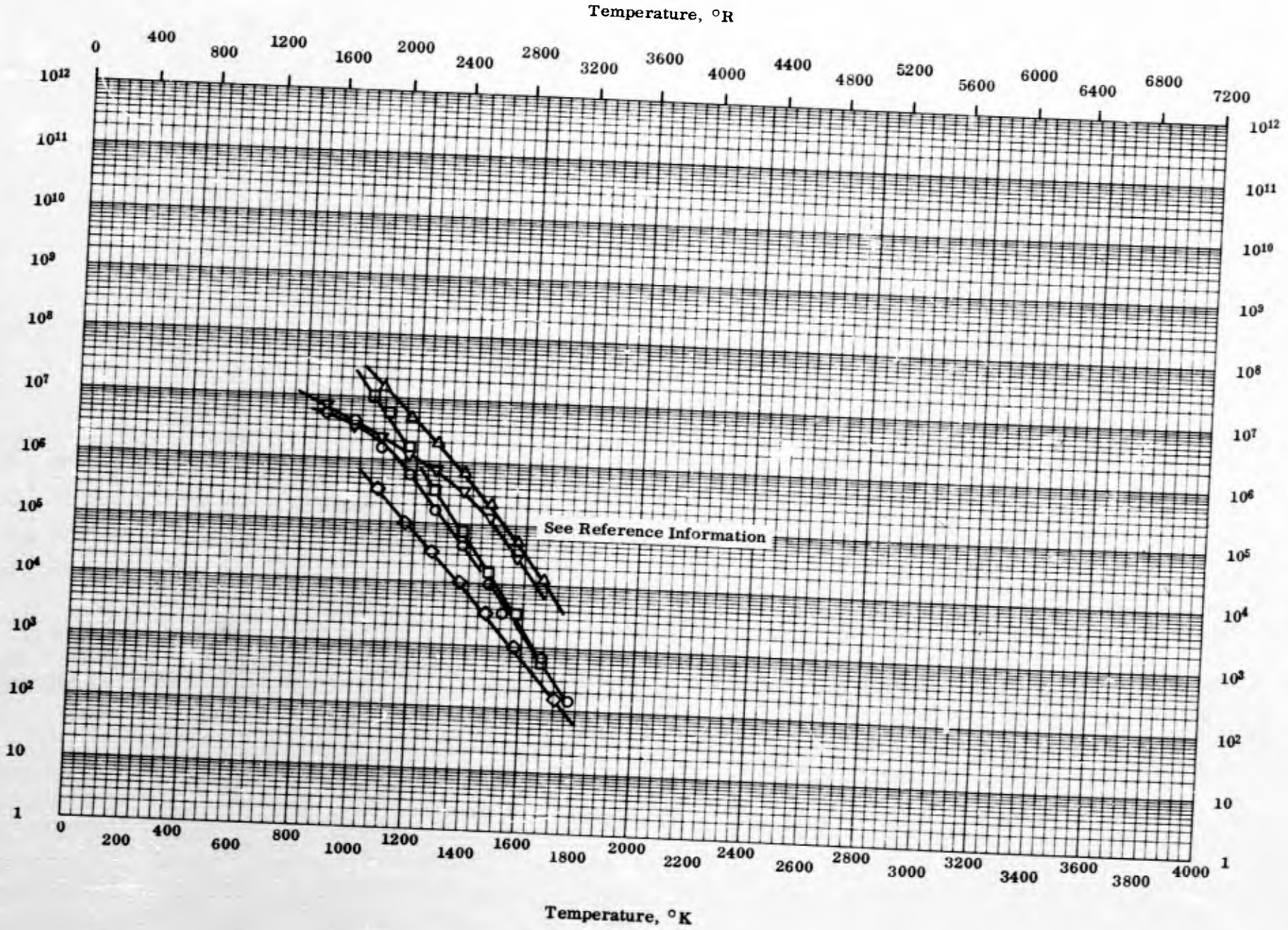


THERMAL CONDUCTIVITY -- LIGHTWEIGHT CONCRETE

THERMAL CONDUCTIVITY -- LIGHTWEIGHT CONCRETE

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-9	513-658		Density 54.3 lb ft^{-3}.	
□	57-9	515-682		Density 63.2 lb ft^{-3}.	



TPRC

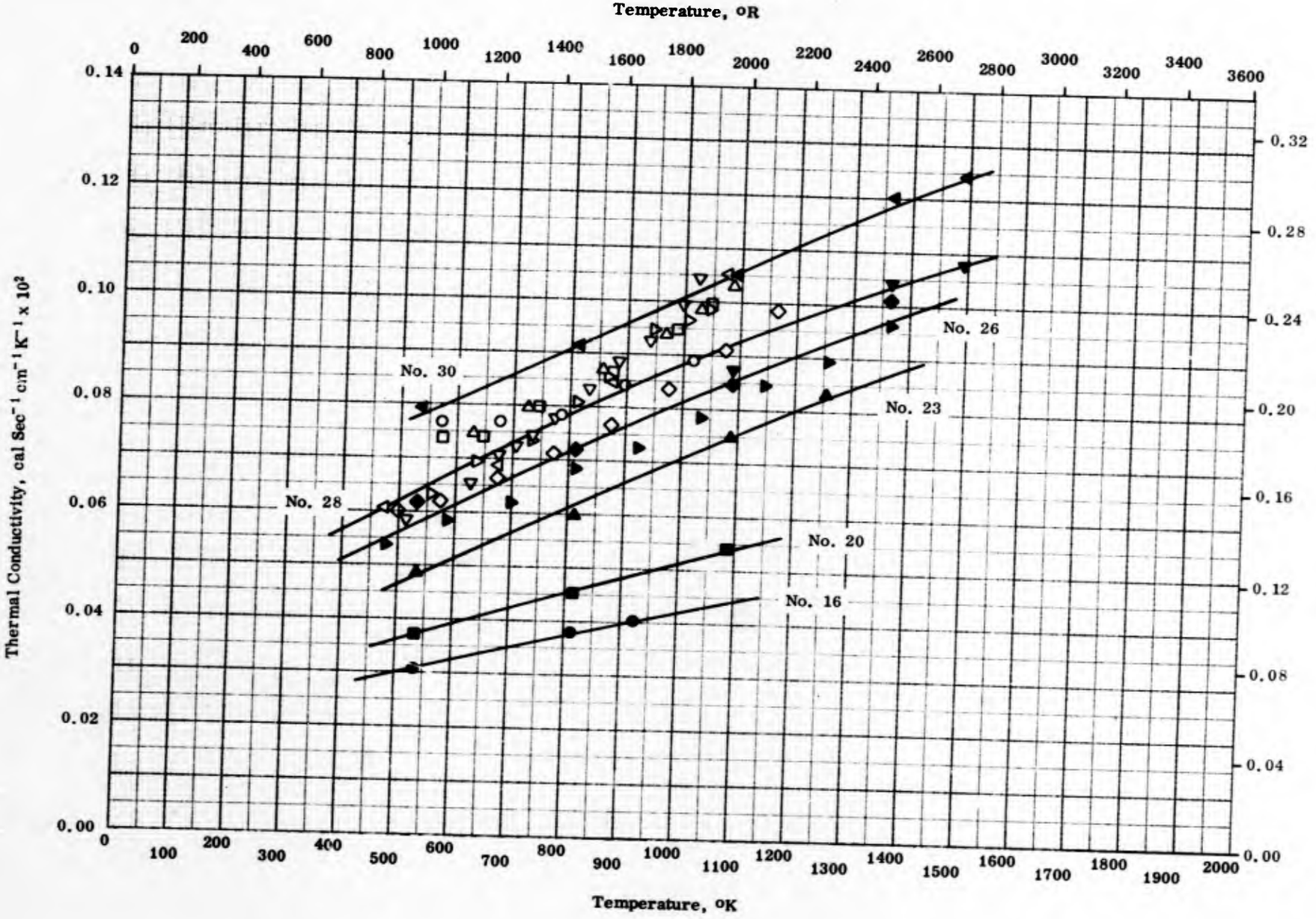
ELECTRICAL RESISTIVITY -- BASIC BRICK

Electrical Resistivity, ohm cm

ELECTRICAL RESISTIVITY -- BASIC BRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	53-8	873-1773	±0.3-±10	Basic brick (Forsterite) commercial material; composition not given; apparent porosity 21%.	
□	53-8	1033-1672	±0.3-±10	88 MgO; porosity 18%.	
△	53-8	1072-1672	±0.3-±10	90-95 MgO; porosity 17%.	
◇	53-8	1072-1672	±0.3-±10	Magnesite-chrome; porosity 19%.	
▽	53-8	872-1572	±0.3-±10	Chrome-magnesite; porosity 14%.	

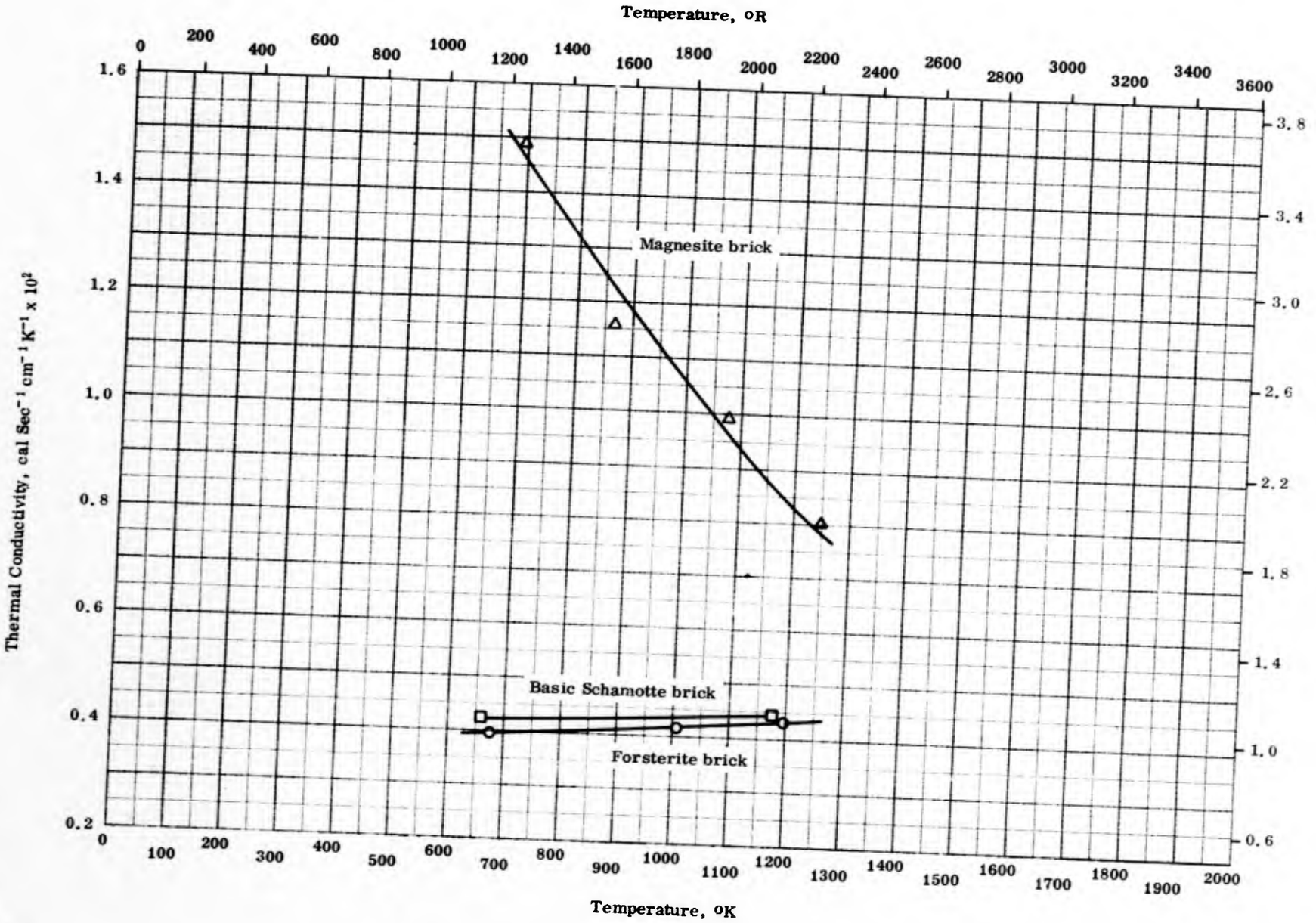


THERMAL CONDUCTIVITY -- INSULATING FIREBRICK

THERMAL CONDUCTIVITY -- INSULATING FIREBRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	49-2	571-1014		Insulating firebrick K-28 made by Babcock and Wilcox 2. 5 lb per standard brick.	
□	50-3	573-1046		Insulating firebrick K-28 made by Babcock and Wilcox.	
△	50-3	576-1082		Same as above.	Same as above; run no. 2.
◇	50-3	498-1163		Same as above.	Same as above; run no. 3.
▽	51-3	511-1021		Insulating firebrick K-28 made by Babcock and Wilcox.	
▷	51-3	553-1041		Same as above.	Same as above; run no. 2.
◁	51-2	473-1073	±20	Insulating firebrick, K-28.	
●	56-3	533-922		Insulating firebrick, ASTM group no. 16.	
■	56-3	533-1089		Insulating firebrick, ASTM group no. 20.	
▲	56-3	533-1256		Insulating firebrick, ASTM group no. 23.	
◆	56-3	533-1367		Insulating firebrick, ASTM group no. 26.	
▼	56-3	533-1422		Insulating firebrick, ASTM group no. 28.	
◀	56-3	533-1422		Insulating firebrick, ASTM group no. 30.	
▶	54-4	478-1361		Insulating firebrick ASTM group no. 26.	

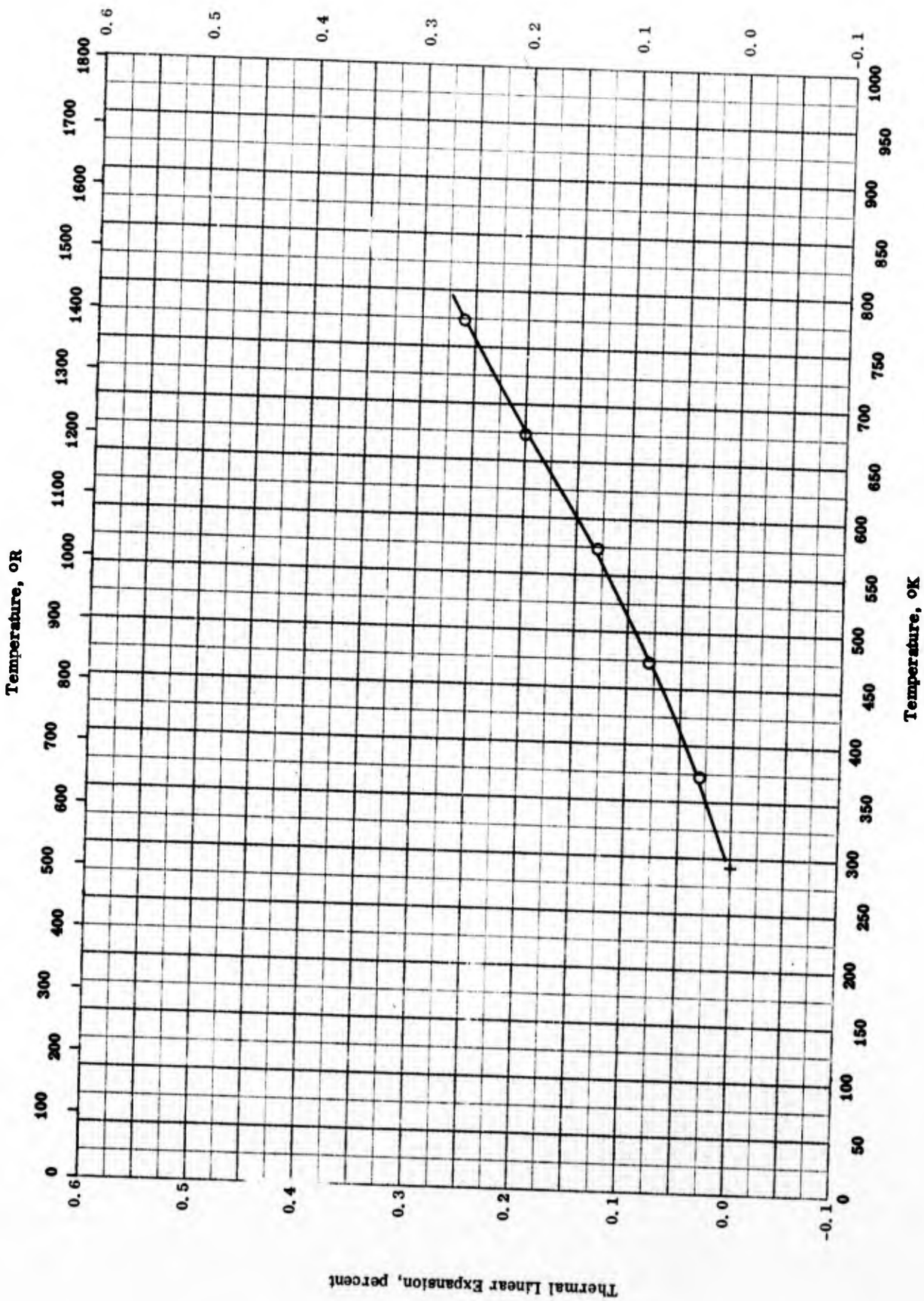


THERMAL CONDUCTIVITY -- MISCELLANEOUS BRICKS

THERMAL CONDUCTIVITY -- MISCELLANEOUS BRICKS

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	57-6	673-1198		Forsterite brick.	
□	57-6	658-1178		Basic Schamotte brick.	
△	57-6	693-1248		Magnesite brick "hu".	

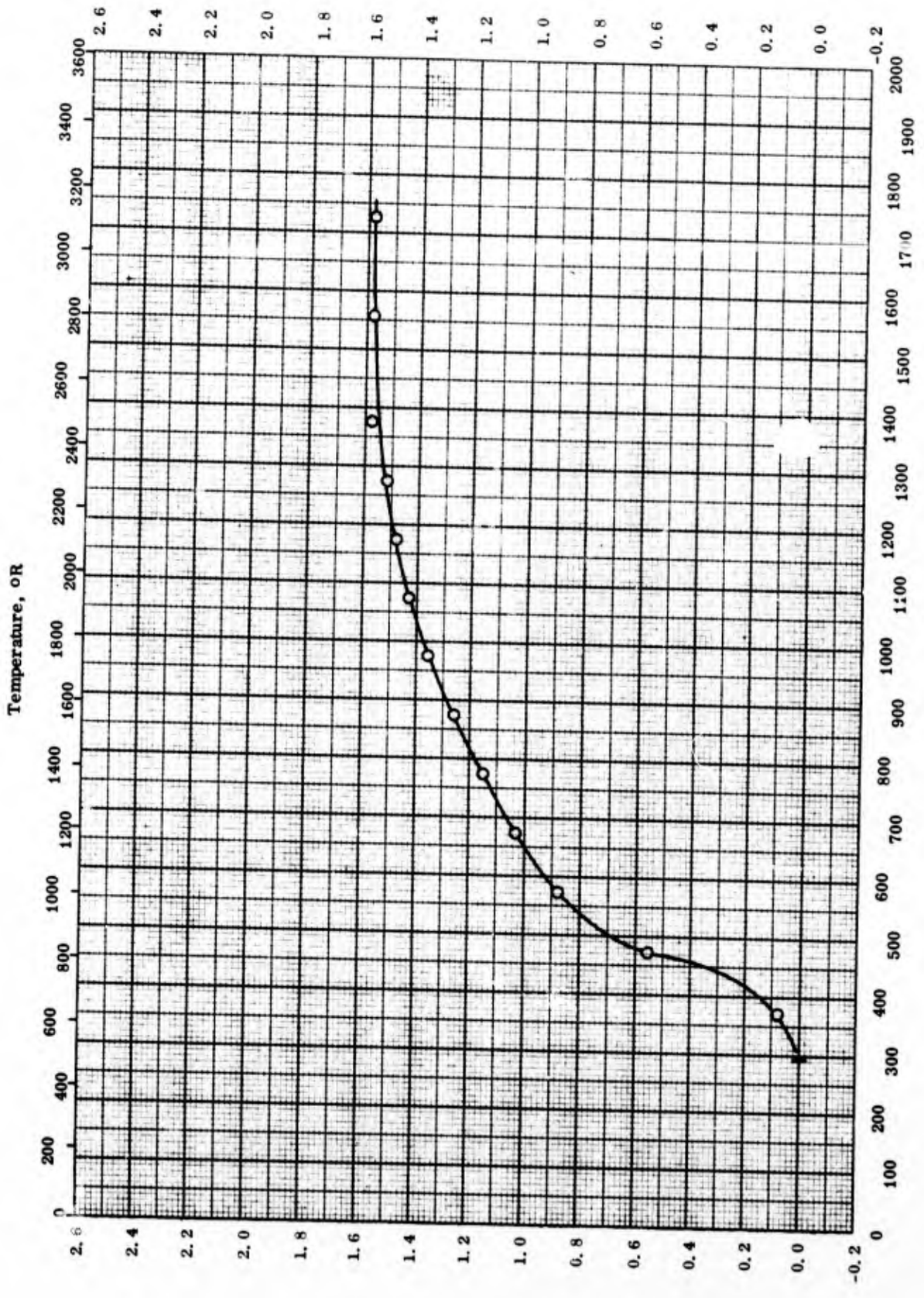


THERMAL LINEAR EXPANSION -- K-30 INSULATING BRICK

THERMAL LINEAR EXPANSION -- K-30 INSULATING BRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	53-14	293-773		Not given.	

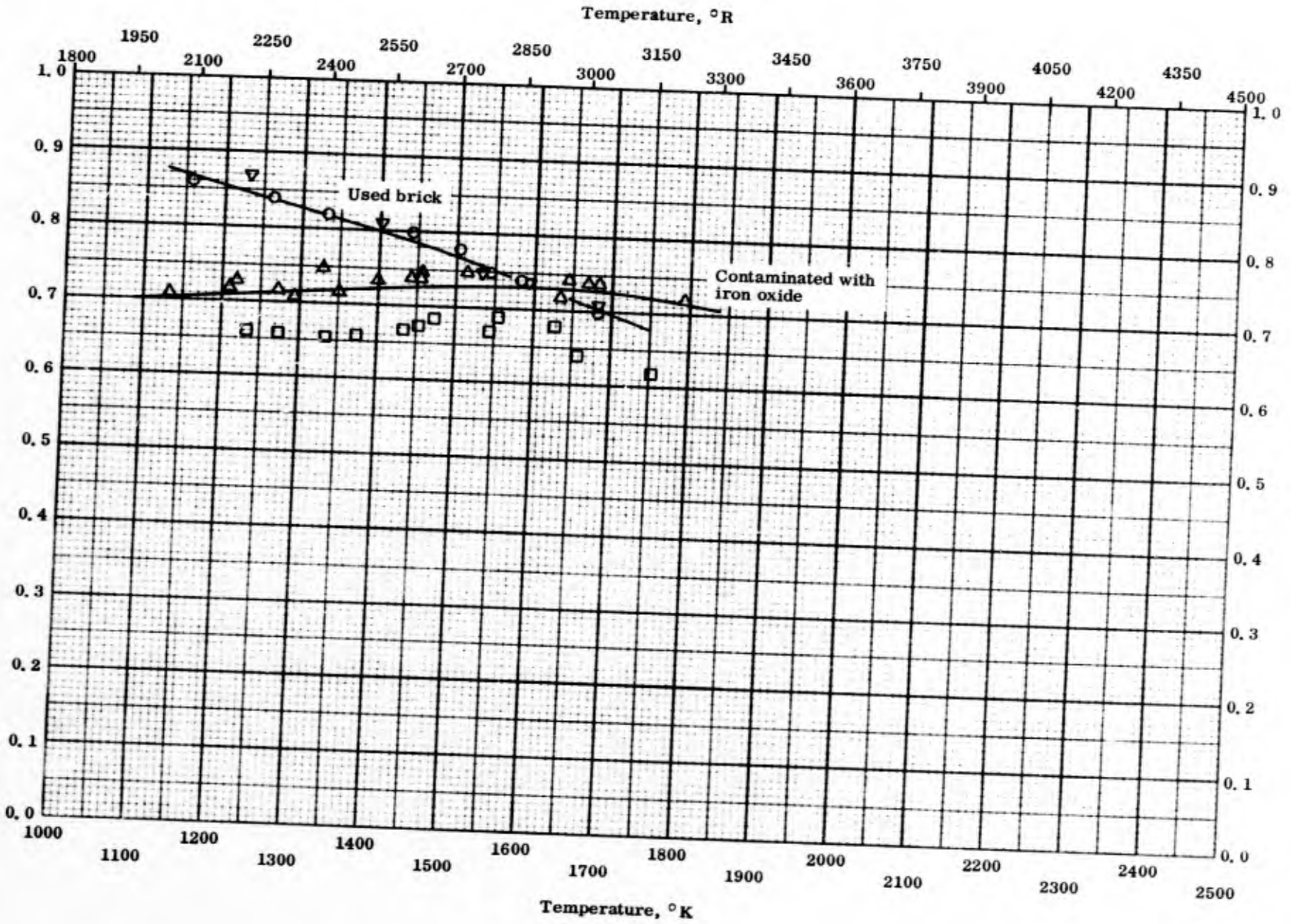


THERMAL LINEAR EXPANSION -- SILICA BRICK

THERMAL LINEAR EXPANSION -- SILICA BRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	57-25	373-1723		Silica refractory; 97.43 - 98.36 SiO_2, 1.2 - 1.8 R_2O_3, and 0.25 - 0.49 CaO; made from 70 - 79 cristobolite, 12 - 18 trydemite, 9 - 12 quartz; material III-H; density 141 lb ft^{-3}.	Mixed 15 min, hydraulically pressed 5 times at 800 kg cm^{-2}, dried, and fired.

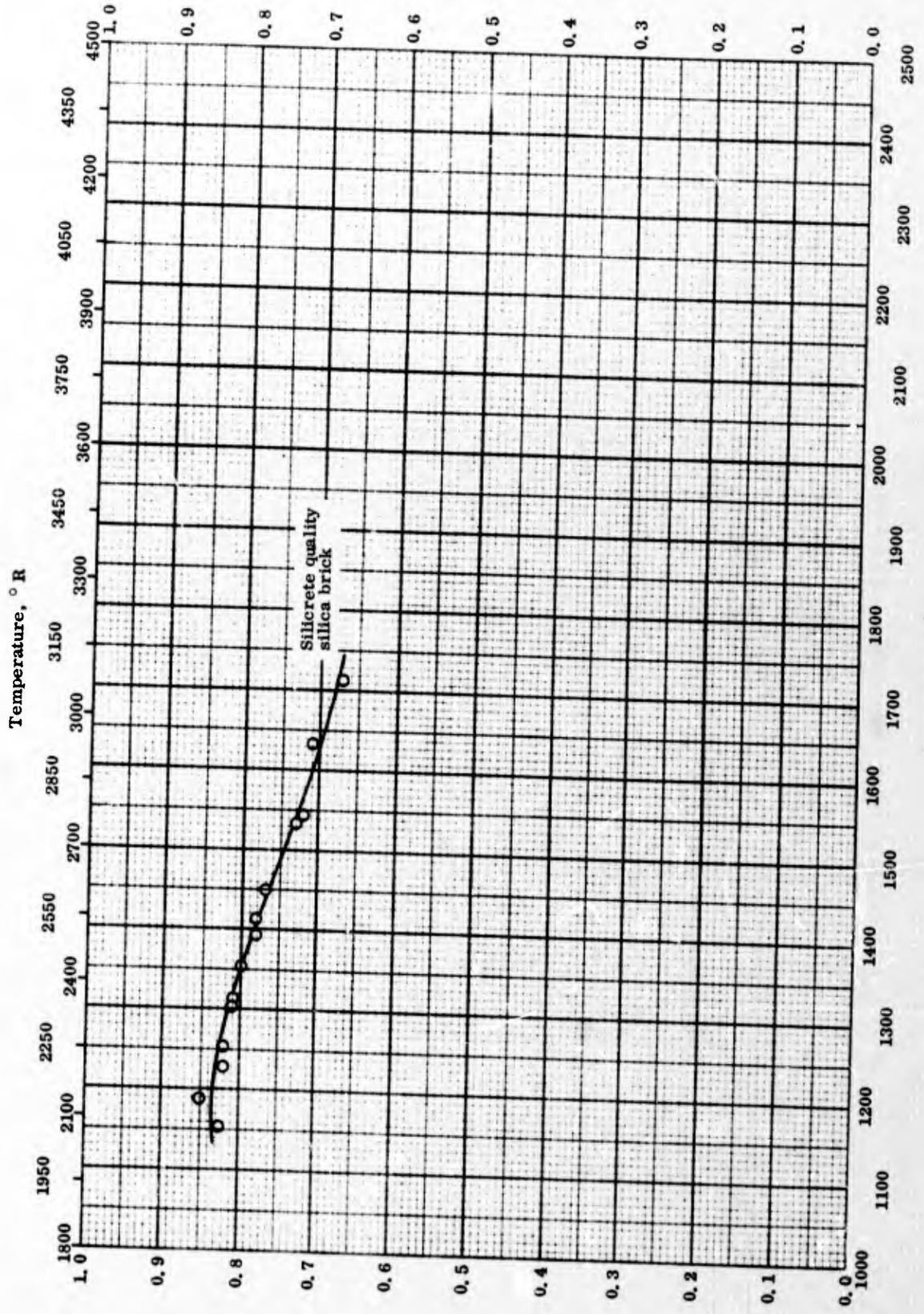


NORMAL TOTAL EMITTANCE -- CHROME - MAGNESITE FIREBRICK

NORMAL TOTAL EMITTANCE -- CHROME - MAGNESITE FIREBRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
○	55-9	1158-1683	~1	Chrome - magnesite firebrick.	Used brick; data taken from smooth curve.
△	55-9	1133-1793	~1	Same as above.	Contaminated with iron oxide; data taken from smooth curve.
□	55-9	1233-1753	~1	Same as above.	Same as above; second sample.
▽	55-9	1153-1683	~1	Chrome - magnesite firebrick.	Rib block; data taken from smooth curve.

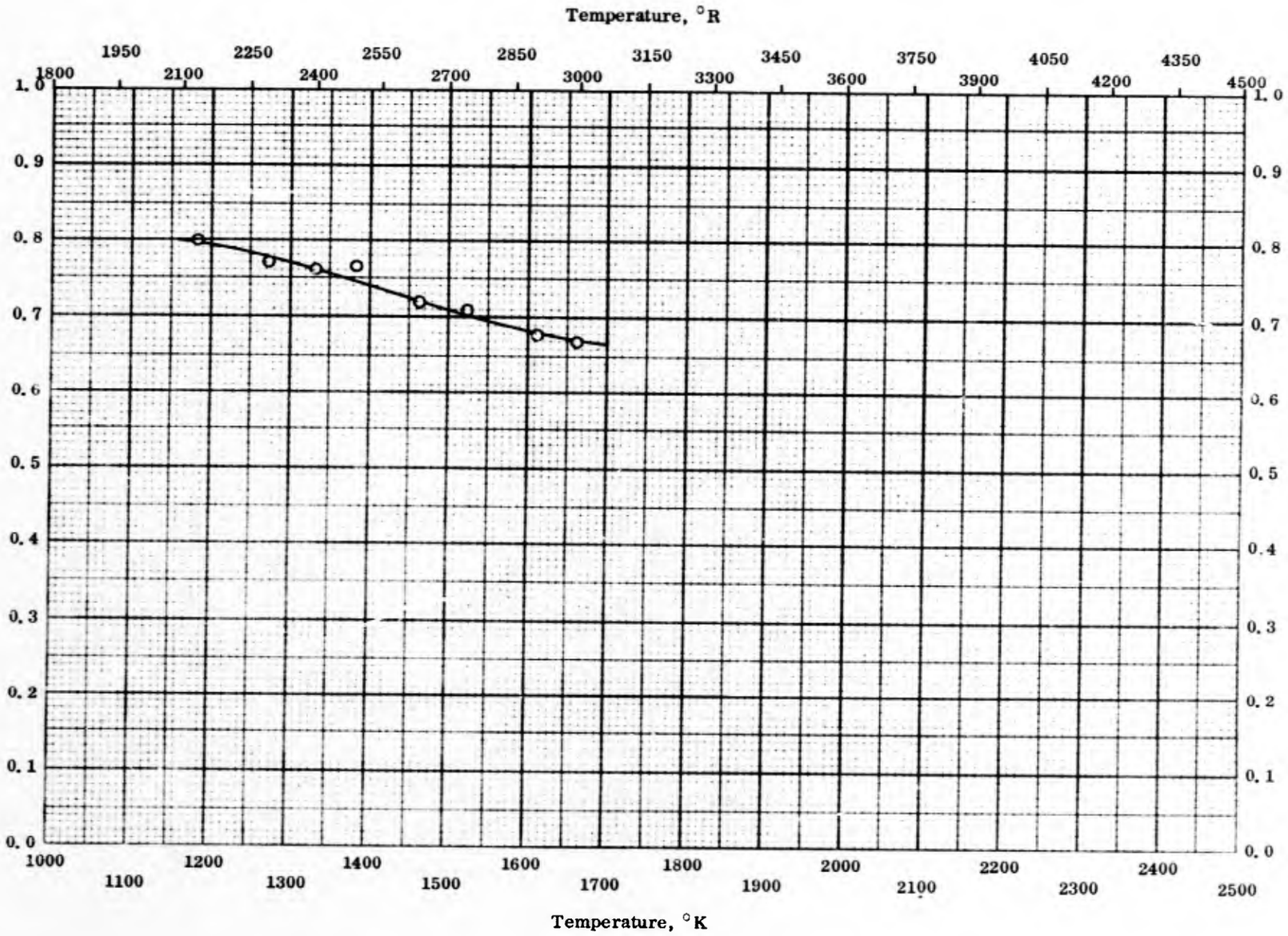


NORMAL TOTAL EMITTANCE -- SILICA BRICK

NORMAL TOTAL EMITTANCE -- SILICA BRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-9	1173-1713	~1	Silicrete quality silica brick.	Data taken from smooth curve.



NORMAL TOTAL EMITTANCE -- SILICEOUS FIREBRICK

Normal Total Emittance

NORMAL TOTAL EMITTANCE -- SILICEOUS FIREBRICK

REFERENCE INFORMATION

Symbol	Ref.	Temp. Range °K	Rept. Error %	Sample Specifications	Remarks
O	55-9	1183-1663	~1	Siliceous firebrick.	Data taken from smooth curve.

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MATERIAL INDEX

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MATERIAL INDEX

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
A																
Acrylics	6-II	1020	1020	-	-	-	-	1022	1024	-	1026	-	-	-	-	-
Actinium (Ac)	1	3	3	3	3	-	-	-	-	-	-	-	-	-	-	5
Aggregates	5	-	-	-	-	-	-	1023	1025	-	-	-	-	-	-	-
AISI 201	3	-	-	-	-	-	-	-	-	-	114	-	-	-	-	-
AISI 202	3	-	-	-	-	-	-	-	-	92	-	-	-	-	-	-
AISI 301	3	145	140	-	-	-	-	159	172	182	203	-	243	274	-	-
AISI 302	3	-	140	-	-	-	-	-	166	186	227	-	236	-	-	-
AISI 302B	3	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 303	3	-	140	-	-	-	151	-	176	-	-	-	236, 245	-	-	-
AISI 304	3	145	140	-	-	-	151	161	-	189	211	-	257, 262	286	-	-
AISI 304L	3	145	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 305	3	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 308	3	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 309	3	-	140	-	-	-	-	-	-	193	-	-	-	286	-	-
AISI 310	3	140	141	-	-	-	153	164	180	-	213	-	233	286	-	-
AISI 310 coated with Hastelloy C	6-II	-	-	-	-	-	-	-	-	-	-	-	1337	-	-	-
AISI 310 coated with Hastelloy X	6-II	-	-	-	-	-	-	-	-	-	-	-	1339	-	-	-
AISI 310 coated with Kennametal K-151A	6-II	-	-	-	-	-	-	-	-	-	-	-	1491	-	-	-
AISI 310 coated with Kennametal K-162B	6-II	-	-	-	-	-	-	-	-	-	-	-	1493	-	-	-
AISI 310 coated with spinal enamel	6-II	-	-	-	-	-	-	-	-	-	-	-	1515	-	-	-
AISI 310 coated with strontium titanate	6-II	-	-	-	-	-	-	-	-	-	-	-	1393	-	-	-
AISI 314	3	-	-	-	-	-	-	-	-	-	223	-	-	-	-	-
AISI 316	3	140, 145	141	-	-	-	149	161	174	184	209	229	236, 247, 259, 264	276	-	-
AISI 317	3	-	141	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 321	3	140, 145	-	-	-	-	-	-	-	186	205	227	236, 249, 259, 266	278	-	-
AISI 321 coated with rinsed-Mason black enamel	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1513	-	-
AISI 321 plated with silver	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1321	-	-
AISI 330	3	-	-	-	-	-	-	-	-	-	213, 407	-	-	-	-	-
AISI 347	3	-	141	-	-	-	149	161	176	186	208	-	251	-	-	-
AISI 403	3	-	53	-	-	-	-	-	79	87	110	-	-	-	-	-
AISI 405	3	-	53	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
AISI 410	3	55	53	-	-	-	-	-	-	87	110	120	122	138	-	-
AISI 414	3	-	-	-	-	-	-	-	-	-	197	-	-	-	-	-
AISI 416	3	-	53	-	-	-	-	-	169	87	110	-	-	-	-	-
AISI 420	3	-	-	-	-	-	-	73	166	87	110, 195	-	-	138	-	-
AISI 422	3	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
AISI 430	3	-	53	-	-	-	-	73	79	90	-	-	-	138	-	-
AISI 430F	3	-	53	-	-	-	-	-	-	-	-	-	-	-	-	-
AISI 431	3	-	-	-	-	-	-	-	-	-	197	-	-	286	-	-
AISI 440A	3	-	53	-	-	-	-	-	-	-	112	-	-	-	-	-
AISI 440B	3	-	53	-	-	-	-	-	-	-	112	-	-	-	-	-
AISI 440C	3	-	53	-	-	-	-	-	81	-	112	-	-	-	-	-
AISI 446	3	55	53	-	-	-	59	67, 73	79	94	98	120	124, 131	138	-	-
AISI 446 coated with aluminum oxide coating	6-II	-	-	-	-	-	-	-	-	-	-	-	1349	-	-	-
AISI 446 coated with Rokide A coating	6-II	-	-	-	-	-	-	-	-	-	-	-	1351	-	-	-
AISI 611	3	-	-	-	-	-	-	-	-	-	452	-	-	-	-	-
AISI 612	3	-	-	-	-	-	-	-	-	-	353	-	-	-	-	-
AISI 613	3	-	-	-	-	-	-	-	-	-	353	-	-	-	-	-
AISI 650	3	-	-	-	-	-	-	-	-	-	401	-	-	-	-	-
AISI 660	3	-	-	-	-	-	-	-	-	-	401	-	-	-	-	-
AISI 661	3	-	-	-	-	-	-	-	-	-	219	-	-	-	-	-
AISI 662	3	-	-	-	-	-	-	-	-	-	401	-	-	-	-	-
AISI 663	3	-	-	-	-	-	-	-	-	-	401	-	-	-	-	-
AISI 664	2-II	-	-	-	-	-	-	-	-	-	1265	-	-	-	-	-
AISI 665	3	-	-	-	-	-	-	-	-	-	401	-	-	-	-	-
AISI 681	2-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
AISI 682	2-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
AISI 690	2-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
AISI C1006	3	-	-	-	-	-	-	-	-	329	-	-	-	-	-	-
AISI C1010	3	-	310	-	-	-	312	316	325	329	335	-	-	-	-	-
AISI C1018	3	-	-	-	-	-	-	-	-	333	-	-	-	-	-	-
AISI C1020	3	-	-	-	-	-	-	-	-	329	-	345-347	-	-	-	-
AISI C1045	3	-	-	-	-	-	-	-	-	333	-	-	-	-	-	-
AISI 3140	3	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-
AISI 4130	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
AISI 4340	3	-	-	-	-	-	-	-	387	395	-	-	-	-	-	-
AISI 8630	3	-	-	-	-	-	-	-	-	-	337	-	-	-	-	-
Akermanite	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
Alathon-10	6-II	1030	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alberit 1005	6-II	-	-	-	-	-	1082	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Alberit 8391-80	6-II	-	-	-	-	-	1082	-	-	-	-	-	-	-	-	-
Alcoa	1	-	-	-	-	-	-	-	-	-	-	-	19	-	-	-
Alkali and alkaline earth aluminum borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1715	-	-	-	-	-
Alkyd-isocyanate foam	6-II	952	-	-	-	-	-	954	956	-	958	-	-	-	-	-
Alumina	4-I	3	3	-	-	3	5	8	11-18	20	22-26	-	28-32	34	37	39
Alumina + Mullite	4-II	-	-	-	-	-	-	-	1534	-	-	-	-	-	-	-
Aluminide coating on niobium	6-II	-	-	-	-	-	-	-	-	-	-	-	1435-1437	1439	-	-
Aluminide coating on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1441-1443	1445	-	-
Aluminide coating on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1447-1449	1451	-	-
Aluminized-silicone paint on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-
Aluminum (Al)	1	7	7	7	7	7	9	11	13	15	17	-	19-23	25	28	30
Aluminum clad boron carbide	5	979	-	-	-	-	-	981	-	-	-	-	-	-	-	-
Aluminum coated with silicon (di-)oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1391	-	-
Aluminum coated with silicon (mon-)oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1389	-	-
Aluminum coating on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1287	-	-
Aluminum, Kaiser	1	-	-	-	-	-	-	-	-	-	-	-	19	-	-	-
Aluminum + ΣX_i	2-II	-	-	-	-	-	-	-	829	831	-	-	-	-	-	-
Aluminum + Beryllium	2-I	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Aluminum + Beryllium + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	729	-	-	-	-	-
Aluminum + Copper	2-I	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-
Aluminum + Copper + ΣX_i	2-II	731	731	731	-	-	5	7	9	-	743-752	-	754-757	759	-	-
Aluminum + Iron	2-I	-	-	-	-	-	733	735	737-739	741	-	-	-	-	-	-
Aluminum + Magnesium	2-I	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-
Aluminum + Magnesium + ΣX_i	2-II	763	763	-	-	-	15	-	17	-	-	-	-	-	-	-
Aluminum + Manganese	2-I	-	-	-	-	-	765	-	767	-	769	-	771	773	-	-
Aluminum + Nickel + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	-	-	19-21	-	-	-
Aluminum + Silicon	2-I	-	-	-	-	-	775	-	778	-	781	-	-	-	-	-
Aluminum + Silicon + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-
Aluminum + Silver	2-I	25, 431	-	-	-	25	783-785	-	788-794	-	796-804	-	-	-	-	-
Aluminum + Uranium	2-I	-	-	-	-	-	27	29	-	-	-	-	-	-	-	-
							-	-	31	-	34	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum + Zinc + ΣX_i	2-II	806	806	806	-	-	808	810	812	814	816	-	818-823	825	-	-
Aluminum alloys (Special designations)																
2S	2-II	-	-	-	-	-	-	-	829	831	-	-	-	-	-	-
14S	2-II	-	-	-	-	-	-	-	739	-	-	-	-	-	-	-
17S	2-II	-	-	-	-	-	-	-	-	-	743	-	-	-	-	-
24S	2-II	731	-	-	-	-	-	735	737	741	745	-	754-757	759	-	-
75S	2-II	806	-	-	-	-	-	810	812	814	816	-	818-823	825	-	-
1075	1	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-
1100	2-II	-	-	-	-	-	-	-	-	831	-	-	-	-	-	-
2024	2-II	731	-	-	-	-	-	735	737	741	745	-	754-757	759	-	-
2219	2-II	-	-	-	-	-	-	-	-	-	-	-	-	759	-	-
3003	2-I	-	-	-	-	-	-	-	-	-	-	-	19-21	-	-	-
6061	2-II	-	-	-	-	-	-	-	-	-	-	-	771	773	-	-
7075	2-II	806	-	-	-	-	-	810	812	814	816	-	818-823	825	-	-
Alpax Gamma	2-II	-	-	-	-	-	785	-	794	-	802	-	-	-	-	-
C-46	2-II	731	731	731	-	-	-	-	-	-	747	-	-	-	-	-
Duralite	2-II	731	731	731	-	-	-	-	739	-	743	-	-	-	-	-
Gamma, γ	2-II	-	-	-	-	-	-	-	-	-	747	-	-	-	-	-
Hydronalium 5	2-I	-	-	-	-	-	15	-	17	-	-	-	-	-	-	-
Hydronalium 7	2-II	-	-	-	-	-	765	-	767	-	-	-	-	-	-	-
Hydronalium 51	2-II	-	-	-	-	-	765	-	767	-	-	-	-	-	-	-
L'A-Z5G	2-II	806	806	806	-	-	808	810	812	-	816	-	-	-	-	-
Lo-Ex	2-II	-	-	-	-	-	785	-	794	-	798	-	-	-	-	-
RAE 40C	2-II	-	-	-	-	-	775	-	778	-	781	-	-	-	-	-
RAE 47B	2-II	-	-	-	-	-	775	-	778	-	781	-	-	-	-	-
RAE 47D	2-II	-	-	-	-	-	775	-	778	-	-	-	-	-	-	-
RAE 55	2-II	-	-	-	-	-	775	-	778	-	781	-	-	-	-	-
RAE 470	2-II	-	-	-	-	-	-	-	-	-	781	-	-	-	-	-
RAE SA1	2-II	-	-	-	-	-	785	-	792	-	798	-	-	-	-	-
RAE SA44	2-II	-	-	-	-	-	785	-	792	-	798	-	-	-	-	-
RR50	2-II	-	-	-	-	-	783	-	-	-	796	-	-	-	-	-
RR50C	2-II	-	-	-	-	-	-	-	788	-	-	-	-	-	-	-
RR53C	2-II	-	-	-	-	-	783	-	788	-	796	-	-	-	-	-
RR59	2-II	-	-	-	-	-	733	-	739	-	745	-	-	-	-	-
RR77	2-II	-	-	-	-	-	808	-	812	-	816	-	-	-	-	-
RR131D	2-II	-	-	-	-	-	765	-	767	-	769	-	-	-	-	-
Thermafond C3-INA	2-II	731	731	731	-	-	-	-	739	-	743	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum alloys (Special designations) (cont.)																
Y	2-II	-	-	-	-	-	733	-	739	-	-	-	-	-	-	-
Aluminum antimonide (AlSb)	6-I	-	-	-	-	-	45	47	-	-	49	-	-	-	-	-
Aluminum borate ($2Al_2O_3 \cdot B_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum borides																1035
AlB_{12}	6-I	-	160	-	-	-	-	-	-	-	-	-	-	-	-	-
AlB_{12}	6-I	-	160	-	-	-	162	-	-	-	-	-	-	-	-	-
Aluminum bubbles - graphite fibers composite system	6-II	-	-	-	-	-	-	-	1279	-	-	-	-	-	-	-
Aluminum carbide (Al_4C_3)	5	-	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum carbide + Aluminum oxide	5	-	-	-	-	-	-	803	-	-	-	-	-	-	-	-
Aluminum-chromium-molybdenum cermets	6-II	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum fluoride (AlF_3)	5	407	407	-	-	407	-	-	-	-	-	-	-	-	-	-
Aluminum-nickel-titanium cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum niobate ($Al_2O_3 \cdot Nb_2O_5$)	4-II	-	1121	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum nitride (AlN)	5	481	481	-	-	-	-	483	485	-	487	-	489-491	493	-	-
Aluminum oxides																
Aluminum oxide (Al_2O_3)	4-I	3	3	-	-	3	5	8	11-18	20	22-26	-	28-32	34	37	39
38-900	4-I	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-
AD-85	4-I	-	-	-	-	-	-	-	-	-	-	-	637	-	639	-
AD-94	4-I	-	-	-	-	-	-	-	-	-	-	-	637	-	639	-
AD-96	4-I	-	-	-	-	-	-	-	-	-	-	-	32	-	37	-
AD-99	4-I	-	-	-	-	-	-	-	-	-	-	-	32	-	37	-
AD-995	4-I	-	-	-	-	-	-	-	-	20	-	-	32	-	-	-
AP-30	4-I	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-
AP-35	4-I	-	-	-	-	-	-	-	-	20	-	-	32	-	37	-
AV-30	4-I	-	-	-	-	-	-	-	-	-	-	-	32	-	37	-
FS-54	4-I	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-
GD-10	4-I	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-
Gulton HSB	4-I	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-
LA-603	4-I	-	-	-	-	-	-	-	-	-	-	-	28-30	-	-	-
RA-4213	4-I	-	-	-	-	-	-	-	-	-	-	-	28-30	-	-	-
TWA 2, A402	4-I	-	-	-	-	-	-	-	-	-	-	-	32	-	-	-
Wesgo Al-300	4-I	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-
Aluminum oxide foam	4-I	-	-	-	-	-	-	-	18	-	26	-	-	-	-	-
Aluminum oxide reinforced by molybdenum fibers	6-II	-	-	-	-	-	-	-	1261	-	1263	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum oxide coating on AISI 446	6-II	-	-	-	-	-	-	-	-	-	-	-	1349	-	-	-
Aluminum oxide + ΣX_i	4-I	-	-	-	-	-	-	-	-	-	635	-	637	-	639	-
Aluminum oxide + Aluminum cermet	6-II	-	-	-	-	-	-	-	-	-	729	-	-	-	-	-
Aluminum oxide + Aluminum silicate	4-II	-	-	-	-	-	-	-	1534	-	-	-	-	-	-	-
Aluminum oxide + Beryllium oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	-	-	599	-	-	-	-	-
Aluminum oxide + Chromium cermet	6-II	731	-	-	-	-	-	-	911	-	733	-	735	-	-	-
Aluminum oxide + Chromium (sesqui-)oxide	4-I	-	-	-	-	-	601	-	-	-	603	-	605	-	-	-
Aluminum oxide + Chromium + + Molybdenum cermet	6-II	737	-	-	-	-	-	-	-	-	739	-	-	-	-	-
Aluminum oxide + Iron cermet	6-II	-	-	-	-	-	-	-	-	-	741	-	-	-	-	-
Aluminum oxide + Magnesium oxide + Beryllium oxide	4-I	-	-	-	-	-	-	-	-	-	607	-	-	-	-	-
Aluminum oxide + Nickel aluminide	5	-	-	-	-	-	-	-	-	-	-	-	747-749	751	-	-
Aluminum oxide + Nickel (mon-)oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	609	-	-	-
Aluminum oxide + Niobium (pent-)oxide	4-I	-	611	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum oxide + Silicon (di-)oxide	4-I	-	-	-	-	-	613	-	615	-	617	-	619	-	-	-
Aluminum oxide + Silicon (di-)oxide + Titanium (di-)oxide	4-I	-	-	-	-	-	-	-	621	-	-	-	-	-	-	-
Aluminum oxide + Thorium (di-)oxide	4-I	-	623	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum oxide + Thorium (di-)oxide + Beryllium oxide	4-I	-	625	-	-	-	-	-	-	-	627	-	-	-	-	-
Aluminum oxide + Titanium aluminide	5	-	-	-	-	-	-	-	-	-	-	-	753-755	757	-	-
Aluminum oxide + Titanium (di-)oxide + Chromium + + Molybdenum cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	747	-	-	-
Aluminum oxide + Tungsten + + Chromium cermet	6-II	-	-	-	-	-	-	-	-	-	743	-	745	-	-	-
Aluminum oxide + Uranium (di-)oxide	4-I	629	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum oxide + Zirconium (di-)oxide	4-I	-	-	-	-	-	-	-	631	-	-	-	-	-	-	-
Aluminum oxide + Zirconium (di-)oxide + Beryllium oxide	4-I	-	633	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum phosphate coating on nickel	6-II	-	-	-	-	-	-	-	-	-	-	-	1429	-	-	-
Aluminum phosphide (AlP)	5	-	-	-	-	-	-	627	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum silicates	4-II	-	-	-	-	-	1187	1189	1191	1193	1195-1197	-	1199-1201	-	1203	-
$Al_2O_3 \cdot SiO_2$	4-II	-	-	-	-	-	-	1189	1191	-	1195	-		-	-	-
$3\ Al_2O_3 \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1189	1191	1193	1197	-	1501	-	1203	-
Aluminum silicate + Aluminum oxide	4-II	-	-	-	-	-	-	-	1562	-	-	-	-	-	-	-
Aluminum silicate + Magnesium oxide	4-II	-	1564	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum silicate glass	4-II	-	-	-	-	-	-	1675	-	1677	-	-	1679	1681	1683-1685	-
Aluminum titanate ($Al_2O_3 \cdot TiO_2$)	4-II	1368	1368	-	-	-	-	1370	1372	-	1374	-	-	-	-	-
Aluminum titanate, vitreous bonded	5	-	-	-	-	-	949-953	-	-	-	955-977	-	-	-	-	-
Aluminum titanate body	4-II	-	-	-	-	-	-	-	-	-	1374	-	-	-	-	-
Aluminum-vanadium intermetallics (Al_3V)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Alundun	4-I	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-
Americium (Am)	1	32	-	-	-	32	-	-	-	-	-	-	-	-	-	34
Americium fluoride (AmF_3)	5	343	-	-	343	343	-		-	-	-	-	-	-	-	345
Analcite	4-II	-	-	-	-	-	-	1324	-	-	-	-	-	-	-	-
Anatase	4-I	445	-	-	-	-	-	454	-	-	-	-	-	-	-	-
Andalusite	4-II	-	-	-	-	-	-	1189	-	-	1195	-	-	-	-	-
Anilin resin	6-II	-	-	-	-	-	-	1078	-	-	-	-	-	-	-	-
Anorthite	4-II	-	-	-	-	-	-	1233	-	-	-	-	-	-	-	-
Antimony (Sb)	1	38	36	36	-	-	40	42	44	-	-	-	-	46	-	-
Antimony bismuth telluride ($Sb_{2-x}Bi_xTe_3$)	6-I	-	-	-	-	-	549	-	551	-	-	-	-	-	-	-
Antimony sulfide (Sb_2S_3)	5	-	-	-	-	-	-	643	-	-	-	-	-	645	-	-
Antimony telluride (Sb_2Te_3)	6-I	543	543	-	-	-	545	-	547	-	-	-	-	-	-	-
Antimony telluride + Bismuth telluride	6-I	-	-	-	-	-	705	-	-	-	-	-	-	-	-	-
Antimony telluride + Indium telluride	6-I	-	-	-	-	-	-	-	707	-	709	-	-	-	-	-
Antimony-zirconium intermetallics ($SbZr_2$)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Araldite casting resin 501	6-II	-	-	-	-	-	-	-	-	-	1012	-	-	-	-	-
Armalon 410L	6-II	-	-	-	-	-	-	-	1218	-	-	-	-	-	-	-
Armco iron	1	578	-	-	-	-	581	583	585	587	589	592	594, 598	602	-	-
Armofoam	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-	-	-
Arsenic aluminides																
AsAl	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
As_2Al_3	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic sulfide (As_2S_3)	5	-	-	-	-	-	-	647	-	-	-	-	-	-	-	-
Arsenic telluride (As_2Te_3)	6-I	-	-	-	-	-	-	-	640	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
B																
Baddeleyite	4-I	-	-	-	-	-	-	-	-	-	585	-	-	-	-	-
Bakelites																
BM-261	6-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
BM-704	6-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
BM-3510	6-II	-	-	-	-	-	-	-	-	-	996	-	-	-	-	-
BM-13014	6-II	-	-	-	-	-	-	-	-	-	992	-	-	-	-	-
BM-13080	6-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
BM-13335	6-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
BM-14316	6-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
BM-14726	6-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
BM-15140	6-II	-	-	-	-	-	-	-	-	-	992	-	-	-	-	-
BM-16468	6-II	-	-	-	-	-	-	-	-	-	992	-	-	-	-	-
BM-17711	6-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
BM-17849	6-II	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	-
DYNH	6-II	-	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Barium + Strontium	2-I	-	36	36	-	-	-	-	-	-	-	-	-	-	-	-
Barium aluminates																
$BaO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	977	-	-	-	-	-
$3\,BaO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	977	-	-	-	-	-
Barium aluminum silicate ($BaO \cdot Al_2O_3 \cdot 2\,SiO_2$)	4-II	-	-	-	-	-	-	1205	-	-	1207	-	-	-	-	-
Barium beryllium titanate ($BaO \cdot BeO \cdot TiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1390	-	-	-	-	-
Barium borate glass	4-II	-	-	-	-	-	-	-	-	-	1609	-	-	-	-	-
Barium (hexa-)boride (BaB_6)	6-I	-	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Barium calcium silicate	4-II	-	-	-	-	-	-	-	-	-	1211	-	-	-	-	-
Barium calcium titanate [$(Ca_xBa_{1-x})O \cdot TiO_2$]	4-II	-	-	-	-	-	-	-	1392	1394	-	-	-	-	-	-
Barium carbide (BaC_2)	5	-	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium cerium lead titanate [$(Ba_{1-x-y}Pb_xCe_y)O \cdot TiO_2$]	4-II	-	-	-	-	-	1398	-	-	-	-	-	-	-	-	-
Barium cerium titanate [$(Ba_{1-x}Ce_x)O \cdot TiO_2$]	4-II	-	-	-	-	-	1396	-	-	-	-	-	-	-	-	-
Barium cerium titanate silicate [$(Ba_{1-x}Ce_x)O \cdot (Ti_{1-x}Si_x)O_2$]	4-II	-	-	-	-	-	1209	-	-	-	-	-	-	-	-	-
Barium cerium titanate stannate [$(Ba_{1-x}Ce_x)O \cdot (Ti_{1-y}Sn_y)O_2$]	4-II	-	-	-	-	-	1354	-	-	-	-	-	-	-	-	-
Barium cerium titanate zirconate [$(Ba_{1-x}Ce_x)O \cdot (Ti_{1-y}Zr_y)O_2$]	4-II	-	-	-	-	-	1500	-	-	-	-	-	-	-	-	-
Barium copper silicate ($BaO \cdot CuO \cdot 4\,SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1213	-	-	-	-	-
Barium crown glass	4-II	-	-	-	-	-	-	1827	-	-	-	-	-	-	-	-
Barium fluoborate glass	4-II	-	-	-	-	-	-	-	-	-	1611	-	-	-	-	-

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Barium fluoride (BaF_2)	5	-	-	-	-	-	-	-	347	-	-	-	-	349	-	-
Barium lanthanum titanate [$(La_XBa_{1-X})O \cdot TiO_2$)]	4-II	-	-	-	-	-	1400	-	1402	-	-	-	-	-	-	-
Barium-lead intermetallics (Ba_2Pb)	6-I	-	-	-	-	-	-	-	642	-	-	-	-	-	-	-
Barium lead silicate glass . . .	4-II	-	-	-	-	-	1689	-	-	-	-	-	-	-	-	-
Barium lead titanates	4-II	-	-	-	-	-	-	-	-	-	1404	-	-	-	-	-
Barium magnesium silicates																
$BaO \cdot 3\ MgO \cdot SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1215	-	-	-	-	-
$BaO \cdot 4\ MgO \cdot 3.5\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1215	-	-	-	-	-
Barium magnesium aluminum silicate ($3\ BaO \cdot 2\ MgO \cdot 8\ Al_2O_3 \cdot 26\ SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1217-1221	-	-	-	-	-
Barium nitride (Ba_3N_2).	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium oxide (BaO)	4-I	-	-	-	-	-	49	51	53	-	-	-	-	-	-	-
Barium oxide + Strontium oxide .	4-I	-	-	-	-	-	-	-	641	-	-	-	-	-	-	-
Barium oxide + Strontium oxide + + Zirconium cermet	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Barium oxide + Strontium oxide + + Zirconium (di-)oxide. . . .	4-I	-	-	-	-	-	-	-	643	-	-	-	-	-	-	-
Barium phosphide (Ba_3P_2) . . .	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium selenide (BaSe)	6-I	-	365	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium silicate glass	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium silicide ($BaSi_2$)	6-I	-	371	-	-	-	-	-	-	1687	-	-	-	-	-	-
Barium stannide (Ba_2Sn)	6-I	-	-	-	-	-	-	-	-	-	373	-	-	-	-	-
Barium strontium ferrites [$(Ba_XSr_{1-X})O \cdot 6\ Fe_2O_3$] . . .	4-II	1067	-	-	-	-	-	-	531	-	-	-	-	-	-	-
Barium strontium titanates. . .	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium sulfide (BaS)	5	649	649	-	-	-	-	651	-	-	1406	-	-	-	-	-
Barium telluride (BaTe)	6-I	-	636	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium titanates																
$BaO \cdot TiO_2$	4-II	-	1376	-	-	-	1378-1380	1382	1384	1386	1388	-	-	-	-	-
$BaO \cdot 3\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1388	-	-	-	-	-
$BaO \cdot 4\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1388	-	-	-	-	-
$BaO \cdot 5\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1388	-	-	-	-	-
$BaO \cdot 6\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1388	-	-	-	-	-
$BaO \cdot 18\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1388	-	-	-	-	-
$2\ BaO \cdot TiO_2$	4-II	-	1376	-	-	-	-	1382	-	-	-	-	-	-	-	-
Barium titanate coating on niobium-zirconium alloy . . .	6-II	-	-	-	-	-	-	-	-	-	-	-	1369	-	-	-
Barium titanate + Calcium titanate	4-II	-	1579	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium titanate + Lead titanate .	4-II	-	-	-	-	-	-	1581	-	-	-	-	-	-	-	-
Barium titanate + Manganese niobate	4-II	-	-	-	-	-	-	-	1583	-	-	-	-	-	-	-

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Barium titanate + Strontium titanate	4-II	-	-	-	-	-	-	1585	-	-	-	-	-	-	-	-
Barium titanium germanium oxide ($BaO \cdot TiO_2 \cdot 3\ GeO_2$)	4-II	-	-	-	-	-	-	-	-	-	1127	-	-	-	-	-
Barium titanium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1691	-	-	-	-	-
Barium uranate ($BaO \cdot UO_3$)	4-II	-	1482	-	-	-	-	1484	-	-	-	-	-	-	-	-
Barium zirconate ($BaO \cdot ZrO_2$)	4-II	-	-	-	-	-	-	1496	-	-	1498	-	-	-	-	-
Beetle	6-II	-	-	-	-	-	-	-	-	-	1002	-	-	-	-	-
Beryl	4-II	-	-	-	-	-	-	-	1225	-	1227	-	-	-	-	-
Beryllia	4-I	55	55	55	55	-	57	59	61	65	67	71	73-77	79-81	83	85
Beryllium (Be)	1	48	48	48	48	48	50	53	55	57	59	-	61	63	-	65
Beryllium QM-V	1	-	-	-	-	-	51	-	-	-	-	-	-	-	-	-
Beryllium + ΣX_i	2-II	841	-	-	-	-	-	843	845	-	847	-	-	-	-	-
Beryllium + Aluminum	2-I	38	-	-	-	-	-	-	40	42	-	-	44	-	-	-
Beryllium + Aluminum + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	833	-	-	-	-	-
Beryllium + Beryllium oxide cermet	6-II	751	-	-	-	751	-	753	757	-	762	-	-	-	-	764-766
Beryllium + Magnesium + ΣX_i	2-II	835	-	-	-	-	837	-	839	-	-	-	-	-	-	-
Beryllium aluminate ($BeO \cdot Al_2O_3$)	4-II	-	-	-	-	-	-	979	-	-	981	-	-	-	-	-
Beryllium aluminosilicate ($3\ BeO \cdot Al_2O_3 \cdot 6\ SiO_2$)	4-II	-	-	-	-	-	-	-	1225	-	1227	-	-	-	-	-
Beryllium borides																
BeB	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BeB_2	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
BeB_4	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
BeB_6	6-I	295	296	-	-	-	-	-	-	-	-	-	-	-	-	-
BeB_9	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Be_2B	6-I	295	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Be_5B	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium indium selenide ($InBeSe_3$)	6-I	-	-	-	-	-	-	-	329	-	-	-	-	-	-	-
Beryllium carbide (Be_2C)	5	15	15	15	15	-	-	17	-	-	19	-	-	-	-	21
Beryllium carbide + ΣX_i	5	-	-	-	-	-	-	303	305	-	-	-	-	-	-	-
Beryllium cermet BM15	6-II	-	-	-	-	-	-	-	757	-	-	-	-	-	-	-
Beryllium cermet LYB 1102	6-II	-	-	-	-	-	-		757	-	-	-	-	-	-	-
Beryllium cermet Y6825	6-II	-	-	-	-	-	-	-	757	-	-	-	-	-	-	-
Beryllium cermet Y6826	6-II	-	-	-	-	-	-	-	757	-	-	-	-	-	-	-
Beryllium cermet Y9384	6-II	-	-	-	-	-	-	-	757	-	-	-	-	-	-	-
Beryllium cermet YB1000	6-II	-	-	-	-	-	-	-	31	-	-	-	-	-	-	-
Beryllium cermet YB9052	6-II	-	-	-	-	-	-	753	757	-	762	-	-	-	-	-
Beryllium cermet YB9053	6-II	-	-	-	-	-	-	-	-	-	762	-	-	-	-	-
Beryllium cermet YB9054	6-II	-	-	-	-	-	-	753	-	-	762	-	-	-	-	-

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Beryllium chromite ($BeO \cdot Cr_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1049	-	-	-	-	-
Beryllium fluoride (BeF_2) . . .	5	351	351	351	351	351	-	-	-	-	-	-	-	-	-	353
Beryllium nitrides																
Be_3N_2	5	-	495	495	495	-	-	-	497	-	-	-	-	-	-	-
Be_3N_4	5	-	495	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium oxides																
Beryllium oxide (BeO) . . .	4-I	55	55	55	55	-	57	59	61	65	67	71	73-77	79-81	83	85
BD-98	4-I	-	-	-	-	-	-	-	61	65	-	-	77	-	-	-
UOX grade	4-I	-	-	-	-	-	-	-	61	-	-	-	-	-	-	-
Beryllium oxide + Aluminum oxide + Magnesium oxide . . .	4-I	-	-	-	-	-	-	-	-	-	645	-	-	-	-	-
Beryllium oxide + Aluminum oxide + Thorium (di-) oxide . .	4-I	-	-	-	-	-	-	-	647	-	649	-	-	-		-
Beryllium oxide + Aluminum oxide + Thorium (di-) oxide + + Magnesium oxide.	4-I	-	-	-	-	-	-	-	651	-	-	-	-	-	-	-
Beryllium oxide + Aluminum oxide + Zirconium (di-) oxide .	4-I	-	-	-	-	-	-	-	653	-	-	-	-	-	-	-
Beryllium oxide + Aluminum oxide + Zirconium (di-) oxide + + Magnesium oxide.	4-I	-	-	-	-	-	-	-	655	-	-	-	-	-	-	-
Beryllium oxide + Beryllium cermet	6-II	-	-	-	-	751	-	755	760	-	762	-	-	-	-	-
Beryllium oxide + Beryllium + +Molybdenum cermet.	6-II	-	-	-	-	-	-	768	770	-	772	-	-	-	-	-
Beryllium oxide + Beryllium + + Silicon cermet	6-II	-	-	-	-	-	-	-	774	-	776	-	-	-	-	-
Beryllium oxide + Magnesium oxide + Aluminum oxide . . .	4-I	-	-	-	-	-	-	-	657	-	-	-	-	-	-	-
Beryllium oxide + Magnesium oxide + Aluminum oxide + + Thorium (di-) oxide	4-I	-	-	-	-	-	-	-	659	-	-	-	-	-	-	-
Beryllium oxide + Magnesium oxide + Aluminum oxide + + Zirconium (di-) oxide. . . .	4-I	-	-	-	-	-	-	-	661	-	-	-	-	-	-	-
Beryllium oxide + Magnesium oxide + Zirconium (di-) oxide + + Aluminum oxide	4-I	-	-	-	-	-	-	-	663	-	-	-	-	-	-	-
Beryllium oxide + Molybdenum cermet	6-II	-	-	-	-	-	-	778	-	-	-	-	-	-	-	-
Beryllium oxide + Molybdenum beryllide	5	-	-	-	-	-	-	759	-	-	-	-	-	-	-	-
Beryllium oxide + Niobium cermet	6-II	780	-	-	-	-	-	-	-	-	782	-	-	-	-	-
Beryllium oxide + Niobium beryllide	5	-	-	-	-	-	-	761	-	-	-	-	-	-	-	-
Beryllium oxide + Tanatlum beryllide	5	-	-	-	-	-	-	763	-	-	-	-	-	-	-	-

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Beryllium oxide + Thorium (di-)oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	-	665	-	-	-	-	-
Beryllium oxide + Titanium beryllide	5	-	-	-	-	-	-	765	-	-	-	-	-	-	-	-
Beryllium oxide + Uranium (di-)oxide	4-I	-	-	-	-	-	-	-	667	-	-	-	-	-	-	-
Beryllium oxide + Zirconium beryllide	5	-	-	-	-	-	-	767	-	-	-	-	-	-	-	-
Beryllium oxide + Zirconium (di-)oxide + Magnesium oxide + + Aluminum oxide	4-I	-	-	-	-	-	-	-	669	-	-	-	-	-	-	-
Beryllium oxide porcelain type 4811	5	1003	-	-	-	-	-	-	1017	-	-	-	-	-	-	-
Beryllium silicate ($2\ BeO \cdot SiO_2$)	4-II										1223					
Beryllium sulfide (BeS)	5	653	653	-	-	-	-	-	-	-	-	-	-	-	-	655
Beryllium titanates																
$BeO \cdot TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1408	-	-	-	-	-
$2\ BeO \cdot TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1408	-	-	-	-	-
$4\ BeO \cdot TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1408	-	-	-	-	-
$6\ BeO \cdot TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1408	-	-	-	-	-
Bismuth-cerium intermetallics																
BiCe	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
$BiCe_3$	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi_3Ce_4	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth selenide tellurides ($Bi_2Te_{3-x}Se_x$)	6-I	-	-	-	-	-	564	-	566	-	-	-	-	-	-	-
Bismuth stannate ($Bi_2O_3 \cdot 3\ SnO_2$)	4-II								1357							
Bismuth telluride (Bi_2Te_3)	6-I	553	553	-	-	-	555	557	559	561	-	-	-	-	-	-
Bismuth telluride + Bismuth selenide	6-I	-	-	-	-	-	711	-	713	-	-	-	-	-	-	-
Bismuth tellurium sulfide (Bi_2Te_2S)	5	-	-	-	-	-	657	-	659	-	-	-	-	-	-	-
Boral clad with boron carbide	5	979	-	-	-	-	-	981	-	-	-	-	-	-	-	-
Borate glasses	4-II	1605	-	-	-	-	1607	-	-	-	1609-1633	-	-	-	-	-
Borolites																
Borolite	6-II	842	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borolite I, grade F	6-II	-	-	-	-	-	-	846	-	-	-	-	-	-	-	-
Borolite I, grade G	6-II	-	-	-	-	-	844	-	-	-	850	-	-	-	-	-
Borolite I, grade S	6-II	-	-	-	-	-	844	846	-	-	-	-	-	-	-	-
Borolite IV	6-II	913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (B)	1	67	67	-	67	67	69	71	-	-	-	-	-	-	-	73
Boron coating on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	1289	-	-	-
Boron coating on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1291	-	-	-
Boron + ΣX_i	2-II	849	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Boron + Iron	2-I	-	-	-	-	46	-	-	-	-	-	-	-	-	-	48
Boron + Silicon	2-I	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-
Boron aluminate ($2\ B_2O_3 \cdot 9\ Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	983	-	-	-	-	-
Boron carbide (B_4C)	5	25	23	-	-	-	-	27	29	31	33	-	35	-	-	37
Boron carbide clad with aluminum	5	979	-	-	-	-	-	981	-	-	-	-	-	-	-	-
Boron carbide coating on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1403	1405	-	-
Boron carbide + Iron cermet	6-II	928	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron oxide (B_2O_3)	4-I	-	-	-	-	-	-	87	-	-	-	-	-	-	-	89
Boron oxide glass	4-II	-	-	-	-	-	-	1635	-	-	-	-	-	-	-	-
Boron nitride (BN)	5	499	499	-	499	-	501	503	505	-	507	-	509-513	515	-	-
Boron nitride + Boron oxide	5	-	-	-	-	-	832	834	836	-	838	-	-	-	-	-
Boron nitride + Graphite	5	-	-	-	-	-	-	828	830	-	-	-	-	-	-	-
Boron phosphide (BP)	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron silicides																
B_4Si	6-I	-	-	-	-	-	-	-	-	-	-	-	375-377	379	-	-
B_6Si	6-I	-	-	-	-	-	-	-	-	-	-	-	375-377	379	-	-
Borosilicate glass	4-II	1693	1693	-	-	-	1695	1697	1695	1701	1703	-	1705-1707	1709	1711-1713	-
Brass	2-I	-	-	-	-	-	170	172	-	174	-	-	178-180	182	-	-
	2-II								1000							
Brass, aluminum	2-II	-	-	-	-	-	-	-	-	-	1004	-	-	-	-	-
Brass, free cutting leaded	2-I	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brass, red	2-II	-	-	-	-	-	-	-	-	-	1002	-	-	-	-	-
Brass, yellow	2-I	-	-	-	-	-	-	-	-	174	-	-	176	-	-	-
	2-II								1000							
Brazing alloy																
GE-62	2-II	-	-	-	-	-	-	-	-	-	1168	-	-	-	-	-
GEH62-V	2-II	-	-	-	-	-	-	1130	-	-	-	-	-	-	-	-
GE-76	2-II	-	-	-	-	-	-	-	-	-	1378	-	-	-	-	-
Bricks																
Bricks	5	-	-	-	-	-	1029	-	1031-1033	-	1035-1037	-	1039-1043	-	-	-
Chrome-magnesite	5	-	-	-	-	-	1029	-	-	-	-	-	1039	-	-	-
Chromomagnesite	4-I	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
Forsterite	5	-	-	-	-	-	1029	-	1033	-	-	-	-	-	-	-
K-30 insulating	5	-	-	-	-	-	-	-	-	-	1035	-	-	-	-	-
Magnesia	5	-	-	-	-	-	1029	-	-	-	-	-	-	-	-	-
Magnesite	4-I	-	-	-	-	-	-	-	743	733, 737	-	-	-	-	-	-

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Bricks (cont.)																
Magnesite-chrome	5	-	-	-	-	-	1029	-	-	-	-	-	-	-	-	-
Magnesite "hu"	5	-	-	-	-	-	-	-	1033	-	-	-	-	-	-	-
Mica	5	-	-	-	-	-	-	-	989	-	-	-	-	-	-	-
Mica, white	5	-	-	-	-	-	-	-	989	-	-	-	-	-	-	-
Silica	4-I	-	-	-	-	-	-	-	816	363, 796, 818	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	1037	-	1041	-	-	-
Silicon carbide	5	-	-	-	-	-	-	-	125	-	-	-	-	-	-	-
Sillimanite	4-I	-	-	-	-	-	-	-	615	-	-	-	-	-	-	-
Vermiculite insulating	5	-	-	-	-	-	-	-	989	-	-	-	-	-	-	-
Bromyrite	5	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-
Bronze	2-I	154	-	-	-	-	156	-	-	-	-	-	162	-	-	-
	2-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
Bronze, aluminum	2-II	-	-	-	-	-	-	-	-	-	950	952	954-958	960	-	-
Bronze, lead	2-II	-	-	-	-	-	-	-	-	-	976	-	-	-	-	-
Bronze, phosnic	2-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
Bronze, silicon	2-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
Bronze, tellurium-aluminum	2-II	-	-	-	-	-	-	-	-	-	950	-	-	-	-	-
Bronze, Tin-Zinc	2-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
Buna S	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	-	-	-
Butadiene-acrylonitrile copolymer	6-II	-	-	-	-	-	-	1054	-	1060	-	-	-	-	-	-
Butyl GR-1	6-II	-	-	-	-	-	-	-	-	1062	-	-	-	-	-	-
C																
CA-2, carbide tool steel	6-II	-	-	-	-	-	-	-	889	-	-	-	-	-	-	-
CA-4, carbide tool steel	6-II	-	-	-	-	-	-	-	889	-	-	-	-	-	-	-
Cadmium (Cd)	1	-	-	-	-	-	-	-	-	-	-	-	75	-	-	-
Cadmium -- Silver	2-I	-	52	52	-	-	-	-	-	-	-	-	-	54	-	-
Cadmium lead silicate glass	4-II	-	-	-	-	-	1731	-	-	-	-	-	-	-	-	-
Cadmium oxides																
CdO	4-I	91	91	-	-	91	-	93	-	-	-	-	-	-	-	97
Cd_2O_3	4-I	-	-	-	-	-	-	-	-	-	95	-	-	-	-	-
Cadmium sulfide (CdS)	5	-	-	-	-	-	661	663	-	-	-	-	665	-	-	-
Cadmium telluride (CdTe)	6-I	-	-	-	-	-	568	570	-	-	-	-	-	-	-	-
Calcia	4-I	99	99	-	-	-	101	103	105	-	107	-	-	-	-	109
Calcium (Ca)	1	-	77	77	-	-	79	-	-	-	-	-	-	-	-	81
Calcium + Magnesium	2-I	-	56	-	-	-	58	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Calcium aluminates																
$CaO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	987	-	-	-	-	-	-	-	-
$CaO \cdot 2\ Al_2O_3$	4-II	985	985	-	-	-	-	987	-	-	-	-	-	-	-	-
$CaO \cdot 6\ Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	991	-	-	-	-	-
$3\ CaO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	987	-	-	-	-	-	-	-	-
$3\ CaO \cdot 5\ Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	989	-	-	-	-	-
$12\ CaO \cdot 7\ Al_2O_3$	4-II	-	-	-	-	-	-	987	-	-	-	-	-	-	-	-
Calcium aluminate + Molybdenum disilicide cermet	6-II	-	-	-	-	-	-	-	-	-	784	-	-	-	-	-
Calcium aluminum silicates																
$CaO \cdot Al_2O_3 \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1233	-	-	1235	-	-	-	-	-
$2\ CaO \cdot Al_2O_3 \cdot SiO_2$	4-II	-	-	-	-	-	-	1233	-	-	1235	-	-	-	-	-
$2\ CaO \cdot 2\ Al_2O_3 \cdot 8\ SiO_2 \cdot 7\ H_2O$	4-II	-	-	-	-	-	-	1233	-	-	-	-	-	-	-	-
Calcium barium cerium titanate $[(Ba_{1-x-y}Ca_xCe_y)O \cdot TiO_2]$	4-II	-	-	-	-	-	1420	-	-	-	-	-	-	-	-	-
Calcium borates																
$CaO \cdot B_2O_3$	4-II	-	1037	1037	-	-	-	1039	-	-	-	-	-	-	-	-
$CaO \cdot 2\ B_2O_3$	4-II	-	1037	1037	-	-	-	1039	-	-	-	-	-	-	-	-
$2\ CaO \cdot B_2O_3$	4-II	-	1037	1037	-	-	-	1039	-	-	-	-	-	-	-	-
$3\ CaO \cdot B_2O_3$	4-II	-	1037	1037	-	-	-	1039	-	-	-	-	-	-	-	-
Calcium borate glass	4-II	-	-	-	-	-	-	-	-	-	1613	-	-	-	-	-
Calcium (hexa-)boride (CaB_6)	6-I	-	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Calcium carbide + Calcium oxide	5	-	-	-	-	-	-	805	-	-	-	-	-	-	-	-
Calcium carbonate ($CaCO_3$)	4-II	-	-	-	-	-	-	-	-	-	-	-	-	1045	-	-
Calcium copper silicate ($CaO \cdot CuO \cdot 4\ SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1238	-	-	-	-	-
Calcium ferrites																
$CaO \cdot Fe_2O_3$	4-II	-	-	-	-	-	-	1069	-	-	-	-	-	-	-	-
$2\ CaO \cdot Fe_2O_3$	4-II	-	-	-	-	-	-	1069	-	-	-	-	-	-	-	-
Calcium fluoride (CaF_2)	5	355	355	-	-	-	-	-	357	-	359	-	-	361	-	-
Calcium hafnate ($CaO \cdot HfO_2$)	4-II	1107	1107	-	-	-	-	-	-	-	1109	-	-	-	-	-
Calcium lanthanum manganese oxide ($La_xCa_{1-x}MnO_3$)	4-II	-	-	-	-	-	1129	-	1131	-	-	-	-	-	-	-
Calcium-lead intermetallics (Ca_2Pb)	6-I	-	-	-	-	-	-	-	646	-	-	-	-	-	-	-
Calcium lead silicate glass	4-II	-	-	-	-	-	1733	-	-	-	-	-	-	-	-	-
Calcium magnesium silicates																
$CaO \cdot MgO \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
$2\ CaO \cdot MgO \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
$3\ CaO \cdot MgO \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
$2\ CaO \cdot 5\ MgO \cdot 8\ SiO_2 \cdot 2\ H_2O$	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
Calcium molybdate ($CaO \cdot MoO_3$)	4-II	-	-	-	-	-	-	1111	-	-	-	-	-	-	-	-
Calcium nitrides																
CaN	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca_3N_2	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-

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Calcium oxide (CaO)	4-I	99	99	-	-	-	101	103	105	-	107	-	-	-	-	109
Calcium oxide + Titanium (di-) oxide	4-I	-	-	-	-	-	-	-	-	-	671	-	-	-	-	-
Calcium selenides (CaSe)	6-I	-	365	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium silicates																
$CaO \cdot SiO_2$	4-II	-	-	-	-	-	-	1229	-	-	1231	-	-	-	-	-
$2\ CaO \cdot SiO_2$	4-II	-	-	-	-	-	-	1229	-	-	1231	-	-	-	-	-
$3\ CaO \cdot SiO_2$	4-II	-	-	-	-	-	-	1229	-	-	-	-	-	-	-	-
Calcium silicate glass	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	1729	-
Calcium silicides																
CaSi	6-I	-	523	-	-	-	-	-	-	-	-	-	-	-	-	-
$CaSi_2$	6-I	-	523	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca_2Si	6-I	-	523	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium stannate ($CaO \cdot SnO_2$)	4-II	-	-	-	-	-	-	-	1359	-	-	-	-	-	-	-
Calcium strontium barium cerium titanate $[(Ba_{1-x-y-z}Ca_xSr_yCe_z)O \cdot TiO_2]$	4-II	-	-	-	-	-	1422	-	-	-	-	-	-	-	-	-
Calcium titanates																
$CaO \cdot TiO_2$	4-II	1410	1410	-	-	-	1412	1414	1416	-	1418	-	-	-	-	-
$3\ CaO \cdot 2\ TiO_2$	4-II	-	-	-	-	-	-	1414	-	-	1418	-	-	-	-	-
Calcium titanate coating on niobium-zirconium alloy	6-II	-	-	-	-	-	-	-	-	-	-	-	1371	-	-	-
Calcium tungstate ($CaO \cdot WO_3$)	4-II	-	-	-	-	-	-	1472	-	-	-	-	-	-	-	-
Calcium uranate ($CaO \cdot UO_3$)	4-II	-	1482	-	-	-	-	1486	-	-	-	-	-	-	-	-
Calcium vanadates																
$CaO \cdot V_2O_5$	4-II	-	-	-	-	-	-	1488	-	-	-	-	-	-	-	-
$2\ CaO \cdot V_2O_5$	4-II	-	-	-	-	-	-	1488	-	-	-	-	-	-	-	-
$3\ CaO \cdot V_2O_5$	4-II	-	-	-	-	-	-	1488	-	-	-	-	-	-	-	-
Calcium zirconate ($CaO \cdot ZrO_2$)	4-II	1502	1502	-	-	-	-	1504	-	-	1506	-	-	-	-	-
Carbide tool steels	6-II	-	-	-	-	-	-	-	889	-	-	-	-	-	-	-
Carbofrax	5	-	-	-	-	-	-	-	307	-	-	-	309-311	-	-	-
Carboloy 44A	6-II	887	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carboloy 55A	6-II	887	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbons																
Carbon (C)	1	83	-	-	-	83	85	-	87	-	-	-	91-93	95	-	-
Amorphous	1	-	-	-	-	-	83	-	87	-	-	-	-	-	-	-
GA grade	1	-	-	-	-	-	-	-	-	-	-	-	91	95	-	-
Pyrolytic	1	83	-	-	-	-	-	-	89	-	-	-	-	-	-	-
Carbon coating on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	1293	1295	-	-	-
Carbon electrode	1	-	-	-	-	-	85	-	87	-	-	-	-	-	-	-
Carbon impregnated graphite	1	-	-	-	-	-	-	-	358	-	-	-	-	-	-	-
Carbon-phenolic laminate MX-4926	6-II	-	-	-	-	-	-	1134	-	-	-	-	-	-	-	-

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Carbon steels	3	-	-	-	-	3	5, 312	7-10	-	12-14	16-20	-	-	-	-	22
Carbonyl nickel	1	-	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Cast iron	3	27	-	-	-	-	-	-	29-37, 437	-	39-41, 444	-	-	-	-	-
Cast iron, gray (see grey cast iron)																
Cast iron, nodular (see Nodular cast iron)																
Castolite	6-II	974	-	-	-	-	-	-	976	1082	978	-	-	-	-	-
Catalin	6-II	-	-	-	-	-	-	-	-	-	986	-	-	-	-	-
Cellulose acetates	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Cellulose acetate, expanded	6-II	-	-	-	-	-	-	-	939	-	-	-	-	-	-	-
Cellulose acetate butyrate	6-II	-	-	-	-	-	-	-	-	-	946	-	-	-	-	-
Cellulose propionate	6-II	-	-	-	-	-	-	-	-	-	944	-	-	-	-	-
Cement-barytes aggregate	5	-	-	-	-	-	-	1023	1025	-	-	-	-	-	-	-
Ceramic laminate	6-II	-	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
Cercor	4-II	-	-	-	-	-	-	-	-	1591	-	-	-	-	-	-
Ceria	4-I	111	111	-	-	-	113	115	119	-	121	-	124-128	-	-	-
Cerium (Ce)	1	402	402	402	402	402	404	406	-	-	-	-	-	-	-	408
Cerium + ΣX_i	2-II	-	853	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium + Neodymium	2-I	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-
Cerium + Silicon + ΣX_i	2-II	-	851	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium aluminate ($2CeO \cdot 3Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	993	-	-	-	-	-
Cerium aluminides																
CeAl	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAl_2$	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAl_4$	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_3Al_2	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium aluminum silicides ($Ce_2Al_3Si_2$)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-bismuth intermetallics (CeBi)	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium borides																
CeB_4	6-I	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CeB_6	6-I	295, 296	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Cerium (tri-)bromide ($CeB4_3$)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-cadmium intermetallics																
CeCd	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCd_2$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCd_3$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCd_{11}$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Cerium carbides																
CeC_2	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium (tri-) chloride ($CeCl_3$)	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-cobalt intermetallics																
$CeCo_2$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCo_5$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-copper intermetallics																
CeCu	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCu_2$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCu_4$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeCu_6$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium (tri-) fluoride (CeF_3)	5	363	363	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-gallium intermetallics ($CeGa_2$)	6-I	662	-	-	-	-	-	365	-	-	-	-	-	-	-	-
Cerium-gold intermetallics																
CeAu	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAu_2$	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAu_3$	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Au	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium hydride (CeH_2)	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-indium intermetallics ($CeIn_3$)	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium (tri-) iodide (CeI_3)	5	-	477	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-lead intermetallics																
$CePb_3$	6-I	662	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Pb	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-magnesium intermetallics																
CeMg	6-I	662	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeMg_3$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeMg_9$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_4Mg	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-mercury intermetallics (CeHg)	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-nickel intermetallics																
$CeNi_2$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeNi_3$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeNi_5$	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Ni_7	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium nitride (CeN)	5	621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-osmium intermetallics ($CeOs_2$)	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Cerium oxides																
CeO	4-I	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CeO_2	4-I	111	111	-	-	-	113	115	119	-	121	-	124-128	-	-	-
Ce_2O_3	4-I	111	-	-	-	-	-	117	-	-	-	-	-	-	-	-
Cerium (di-)oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	673	-	-	-	-	-	-	-
Cerium (di-)oxide + Uranium oxides	4-I	675	-	-	-	-	-	-	677	-	-	-	-	-	-	-
Cerium phosphide (CeP)	5	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-platinum intermetallics ($CePt_2$)	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium selenides																
CeSe	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_3Se_4	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium silicide ($CeSi_2$)	6-I	523	523-524	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-silver intermetallics																
CeAg	6-I	662	662	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAg_2$	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeAg_3$	6-I	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium stannides																
$CeSn_3$	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Sn	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Sn_3	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium sulfides																
CeS	5	667	667	-	-	-	670	672	674	-	676	-	-	-	-	678
CeS_2	5	667	667	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2S_3	5	667	667	-	-	-	-	672	674	-	676	-	-	-	-	-
Ce_3S_4	5	667	667	-	-	-	-	-	-	-	-	-	-	-	-	678
Cerium tellurides																
$CeTe_2$	6-I	636	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_3Te_4	6-I	636	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-thallium intermetallics																
CeTl	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
$CeTl_3$	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce_2Tl	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium vanadate ($Ce_2O_3 \cdot V_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1490	-	-	-	-	-
Cermets (also see individual cermets)																
Aluminum-chromium-molybdenum cermets	6-II	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum-nickel-titanium cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Cermets (also see individual cermets) (cont.)																
Aluminum oxide + Aluminum cermet	6-II	-	-	-	-	-	-	-	-	-	729	-	-	-	-	-
Aluminum oxide + Chromium cermet	6-II	731	-	-	-	-	-	-	911	-	733	-	735	-	-	-
Aluminum oxide + Chromium + + Molybdenum cermet	6-II	737	-	-	-	-	-	-	-	-	739	-	-	-	-	-
Aluminum oxide + Iron cermet	6-II	-	-	-	-	-	-	-	-	-	741	-	-	-	-	-
Aluminum oxide + Titanium (di-) oxide + Chromium + + Molybdenum cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	747	-	-	-
Aluminum oxide + Tungsten + + Chromium cermet	6-II	-	-	-	-	-	-	-	-	-	743	-	745	-	-	-
Barium oxide + Strontium oxide + Zirconium cermet.	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Beryllium + Beryllium oxide cermet	6-II	751	-	-	-	751	-	753	757	-	762	-	-	-	-	764-766
Beryllium oxide + Beryllium cermet	6-II	-	-	-	-	751	-	755	760	-	762	-	-	-	-	-
Beryllium oxide + Beryllium + + Molybdenum cermet	6-II	-	-	-	-	-	-	768	770	-	772	-	-	-	-	-
Beryllium oxide + Beryllium + + Silicon cermet	6-II	-	-	-	-	-	-	-	774	-	776	-	-	-	-	-
Beryllium oxide + Molybdenum cermet	6-II	-	-	-	-	-	-	778	-	-	-	-	-	-	-	-
Beryllium oxide + Niobium cermet	6-II	780	-	-	-	-	-	-	-	-	782	-	-	-	-	-
Boron carbide + Iron cermet.	6-II	928	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium aluminate + + Molybdenum (di-) silicide cermet	6-II	-	-	-	-	-	-	-	-	-	784	-	-	-	-	-
Chromium-molybdenum-silicon cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-silicon-titanium cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium boride + Chromium-molybdenum intermetallic cermet	6-II	913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium silicide cermets	6-II	-	-	-	-	-	-	-	-	-	915	-	-	-	-	-
Chromium-titanium intermetallics + Copper cermets.	6-II	917	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-titanium intermetallics + Molybdenum cermets	6-II	919	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-chromium alloys + + Titanium (di-) boride cermet	6-II	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Cermets (also see individual cermets) (cont.)																
Europium oxide + Iron-chromium alloy cermet	6-II	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Hafnium carbide + Zirconium cermet	6-II	-	-	-	-	-	-	-	-	-	786	-	-	-	-	-
Magnesium oxide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	852	-	-	-	-	-
Molybdenum (di-) silicide + + Copper cermets	6-II	923	-	-	-	-	-	-	-	-	788	-	-	-	-	-
Molybdenum-silicon-titanium cermet	6-II	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon carbide + Magnesium oxide + Nickel aluminide cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon carbide + Silicon cermet	6-II	-	-	-	-	-	-	-	-	-	854	-	-	-	-	-
Silicon (di-) oxide + Aluminum cermet	6-II	-	-	-	-	-	-	-	856	-	-	-	-	-	-	-
Sodium fluoride + Beryllium ferride cermet	6-II	-	-	-	-	-	-	-	-	-	790	-	-	-	-	-
Strontium titanate + Cobalt cermet	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Tantalum carbide + Iron cermet	6-II	858	-	-	-	-	-	-	792	-	-	-	-	-	-	-
Tantalum carbide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	860	-	-	-	-	-
Titanium carbide + Cobalt cermet	6-II	862	-	-	-	-	-	-	-	-	-	-	-	-	-	794
Titanium carbide + Molybdenum + Tungsten cermet	6-II	-	-	-	-	-	-	-	911	-	864	-	-	-	-	-
Titanium carbide + Nickel cermet	6-II	868	-	-	-	-	-	-	-	-	866	-	-	-	-	-
Titanium carbide + Niobium carbide + Nickel cermet	6-II	-	-	-	-	-	-	871	873	-	875-877	-	-	-	-	-
Titanium carbide + Tungsten cermet	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Titanium nitride + Chromium + + Titanium cermet	6-II	-	-	-	-	-	-	-	-	-	879	-	-	-	-	-
Titanium (mon-) oxide + + Chromium-titanium alloys cermet	6-II	-	-	-	-	-	-	-	-	-	909	-	-	-	-	-
Titanium tungsten (di-) carbide + Cobalt cermet	6-II	-	-	-	-	-	-	-	-	-	796	-	-	-	-	-
Titanium tungsten (di-) carbide + Tantalum cermet	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
Tungsten carbide + Chromium-cobalt alloys cermet	6-II	-	-	-	-	-	-	-	-	-	883	-	-	-	-	-
											895	-	-	-	-	-

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Cermets (also see individual cermets) (cont.)																
Tungsten carbide + Cobalt cermet	6-II	-	-	-	-	-	-	-	889	-	897-905	-	-	-	-	-
Tungsten carbide + Nickel cermet	6-II	-	-	-	-	-	-	-	-	-	907	-	-	-	-	-
Uranium (mono-) carbide + + Molybdenum cermet	6-II	-	-	-	-	-	-	-	-	-	891	-	-	-	-	-
Uranium (mono-) carbide + + Uranium cermet	6-II	-	-	-	-	-	-	-	-	-	893	-	-	-	-	-
Uranium (di-) oxide + + Chromium cermet	6-II	-	-	-	-	-	798	-	800	-	802	-	-	-	-	-
Uranium (di-) oxide + + Molybdenum cermet	6-II	-	-	-	-	-	804	-	806	-	808	-	-	-	-	-
Uranium (di-) oxide + + Niobium cermet	6-II	-	-	-	-	-	810	-	812	-	-	-	-	-	-	-
Uranium (di-) oxide + Stainless steel cermet	6-II	-	-	-	-	-	814	-	816	-	818	-	-	-	-	-
Uranium (di-) oxide + + Zirconium cermets	6-II	820	-	-	-	-	-	-	822	-	824	-	-	-	-	-
Zirconium (di-) boride cermet	6-II	842	-	-	-	-	844	846	848	-	850	-	-	-	-	-
Zirconium (di-) oxide + + Titanium cermet	6-II	-	-	-	-	-	-	826	828	830	832	-	-	-	-	-
Zirconium (di-) oxide + + Yttrium oxide + Zirconium cermet	6-II	-	-	-	-	-	-	-	834	-	-	-	-	-	-	-
Zirconium (di-) oxide + + Zirconium cermet	6-II	-	-	-	-	-	-	-	-	836	838	-	-	-	-	840
Cesium chloride (CsCl)	5	-	-	-	-	-	-	315	-	-	-	-	-	-	-	-
Chemaco 342	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 343	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 344	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 345	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 346	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco SPZ 325	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 326	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 327	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 327-MS	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 329	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 330	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 331	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 332	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chloromethyoxetane, 3, 3 bis-	6-II	-	1076	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromalloy W-2 coating on molybdenum-titanium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1505-1509	-	-	-

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Chromium (Cr)	1	410	410	-	-	410	412	414	416	418	420	-	422-426	428-432	-	434
Chromium, electrolytic	1	-	-	-	-	-	412	-	416	-	420	-	-	-	-	-
Chromium + ΣX_i	2-II	873	-	-	-	873	875	-	877	-	-	-	-	-	-	-
Chromium + Aluminum + ΣX_i . .	2-II	-	-	-	-	-	-	855	-	-	-	-	-	-	-	-
Chromium + Iron	2-I	-	62	-	-	-	64	66	-	-	-	-	-	-	-	-
Chromium + Iron + ΣX_i	2-II	857	-	-	-	-	-	859	-	-	861	-	-	-	-	-
Chromium + Molybdenum . . .	2-I	-	-	-	-	-	-	-	-	-	68	-	-	-	-	-
Chromium + Molybdenum + ΣX_i .	2-II	863	-	-	-	-	-	-	-	-	865	-	-	-	-	-
Chromium + Nickel	2-I	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-
Chromium + Nickel + ΣX_i . . .	2-II	-	867	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium + Silicon	2-I	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium + Silicon + ΣX_i . . .	2-II	869	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium + Tungsten	2-I	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium + Tungsten + ΣX_i . .	2-II	871	-	-	-	-	-	-	-	-	76	-	-	-	-	-
Chromium alloys (special designations)											-	-	-	-	-	-
Ferrochromium	2-II	-	-	-	-	-	-	859	-	-	-	-	-		-	-
Aluminothermic chromium .	2-II	-	-	-	-	-	-	859	-	-	-	-	-	-	-	-
Chromium aluminides																
CrAl	6-I	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
$CrAl_3$	6-I	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
Cr_9Al	6-I	-	3	-	-	-	-	-	-	-	5	-	-	-	-	-
Chromium beryllide ($CrBe_2$) . .	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium borides																
CrB	6-I	164	164	-	-	-	-	166	-	-	-	-	-	-	-	-
CrB_2	6-I	164	164	-	-	-	-	166	-	-	168	-	-	-	-	-
Cr_2B	6-I	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_3B_4	6-I	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_4B	6-I	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_5B_3	6-I	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (di-)boride + + Chromium-molybdenum intermetallic cermet	6-II	913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (di-)boride + + Titanium (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (di-)boride + + Vanadium (di-)boride . . .	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium carbides																
CrC	5	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_3C_2	5	39	39	-	-	-	-	41	-	-	45	-	-	-	-	-
Cr_4C	5	-	-	-	-	-	-	43	-	-	-	-	-	-	-	-
Cr_5C_2	5	-	-	-	-	-	-	43	-	-	-	-	-	-	-	-
Cr_7C_3	5	-	39	-	-	-	-	43	-	-	-	-	47	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Chromium carbides (cont.)																
$Cr_{23}C_6$	5	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium carbide-cobalt blend on iron	6-II	-	-	-	-	-	-	-	-	-	-	1407	1409	-	-	-
Chromium-molybdenum silicides																
(Cr, Mo)Si_2	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(Cr, Mo)$_5Si$	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-molybdenum-silicon cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-niobium intermetallics (Cr_2Nb)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium nitrides																
CrN	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_2N	5		621													
Chromium (sesqui-) oxide (Cr_2O_3)	4-I	-	-	-	-	-	130	132	-	-	134	-	136-138	140	-	-
Chromium (sesqui-) oxide + + Aluminum oxide	4-I	-	-	-	-	-	679	-	-	-	681	-	683	-	-	-
Chromium (sesqui-) oxide + + Molybdenum (di-) silicide	5	-	-	-	-	-	-	-	-	-	-	-	769	-	-	-
Chromium (sesqui-) oxide + + Nickel (mon-) oxide	4-I	-	-	-	-	-	685	-	-	-	-	-	-	-	-	-
Chromium (sesqui-) oxide + + Niobium (pent-) oxide	4-I	-	-	-	-	-	687	-	-	-	-	-	-	-	-	-
Chromium (sesqui-) oxide + + Titanium-chromium intermetallics	5	-	-	-	-	-	-	-	-	-	-	-	771-773	775	-	-
Chromium (sesqui-) oxide + + Yttrium oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	689	-	-	-
Chromium phosphides (CrP)	5	635	635	-	-	-	639	-	-	-	-	-	-	-	-	-
Chromium silicides																
CrSi	6-I	-	381	-	-	-	383	385	-	-	389	-	-	-	-	-
$CrSi_2$	6-I	-	381	-	-	-	383	385	387	-	389	-	-	-	-	-
Cr_3Si	6-I	-	381	-	-	-	-	385	-	-	389	-	391-393	395	-	-
Cr_5Si_2	6-I	-	-	-	-	-	-	-	-	-	389	-	-	-	-	-
Cr_5Si	6-I	-	381	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr_5Si_3	6-I	-	-	-	-	-	-	385	-	-	-	-	-	-	-	-
Chromium silicide cermets	6-II	-	-	-	-	-	-	-	-	-	915	-	-	-	-	-
Chromium (di-) silicide + + Molybdenum (di-) silicide	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-silicon-titanium cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-tantalum intermetallics (Cr_3Ta_2)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Chromium-titanium intermetallics + Chromium (sesqui-) oxide	5	-	-	-	-	-	-	-	-	-	926	-	928-930	932	-	-
Chromium-titanium intermetallics + Copper cermets	5	917	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-titanium intermetallics + Molybdenum cermets	6-II	919	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium zirconate ($Cr_2O_3 \cdot ZrO_2$)	4-II	-	-	-	-	-	-	-	-	-	1508	-	-	-	-	-
Chromium-zirconium intermetallics (Cr_2Zr)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Chronin	2-I	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-
Chrycote coating on copper	6-II	-	-	-	-	-	-	-	-	-	-	-	1499	-	-	-
Clad steel	6-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
Clinoenstatite	4-II	-	-	-	-	-	-	-	-	-	1295	-	-	-	-	-
Coatings																
Aluminide on niobium	6-II	-	-	-	-	-	-	-	-	-	-	-	1435-1437	1439	-	-
Aluminide on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1447-1449	1451	-	-
Aluminized-silicone paint on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-
Aluminum on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1287	-	-
Aluminum oxide on AISI 446	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1349	-	-
Aluminum phosphate on nickel	6-II	-	-	-	-	-	-	-	-	-	-	-	1431	-	-	-
Barium titanate on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1371	-	-	-
Boron on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	1289	-	-	-
Boron on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1291	-	-	-
Boron carbide on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1403	1405	-	-
Calcium titanate on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1371	-	-	-
Carbon on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	1293	1295	-	-	-
Chromalloy W-2 on molybdenum-titanium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1505-1509	-	-	-
Chromium carbide-cobalt blend on iron	6-II	-	-	-	-	-	-	-	-	-	-	1407	1409	-	-	-
Chrycote on copper	6-II	-	-	-	-	-	-	-	-	-	-	-	1499	-	-	-
Cobalt oxide on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1373-1375	-	-	-
Copper on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1301	-	-
Dow-Corning XP-310 on Ti-75A (AMS 4901)	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Coatings (cont.)																
Durak MG on molybdenum-titanium alloy	6-II	-	-	-	-	-	-	-	-	-	-	-	1501-1503	-	-	-
Enamel on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1515	-	-	-
Enamel on AISI 321	6-II	-	-	-	-	-	-	-	-	-	-	-	1513	-	-	-
Enamel on Inconel	6-II	-	-	-	-	-	1511	-	-	-	-	-	-	-	-	-
Gold on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1307	-	-
Gold on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1303	1305	-	-
Graphite, pyrolytic, on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1297-1299	-	-	-
Hafnium (di-)oxide on tungsten	6-II	-	-	-	-	-	-	-	-	-	-	-	1377-1379	-	-	-
Hastelloy C on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1337	-	-	-
Hastelloy X on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1339	-	-	-
Iron(ic) oxide on stellite no. 25 (L-605)	6-II	-	-	-	-	-	-	-	-	-	-	-	1381-1383	-	-	-
Iron titanate on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1385	-	-	-
Kennametal K-151A on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1491	-	-	-
Kennametal K-162B on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1493	-	-	-
Magnesium fluoride on quartz	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1425	1427	-
Molybdenum on iron	6-II	-	-	-	-	-	-	-	-	-	-	1309	1311	-	-	-
NBS coating A-418 on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1361-1363	-	-	-
NBS coating A-418 on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1365-1367	-	-	-
NBS coating N-143 on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1353-1355	-	-	-
NBS coating N-143 on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1357-1359	-	-	-
Nickel aluminide on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1453-1455	1457	-	-
Nickel chromite on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1387	-	-	-
Nickel-chromium alloys on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1333	1335	-	-
Niobium aluminide on niobium	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1459	-	-
Platinum on copper	6-II	-	-	-	-	-	-	-	-	-	-	-	1313	-	-	-
Platinum on quartz	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1317	1319	-
Platinum on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1315	-	-	-

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Coatings (cont.)																
Rokide A on AISI 446	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1351	-	-
Rokide C on titanium alloy Ti-6 Al-4 V	6-II	-	-	-	-	-	-	-	-	-	-	-	1345-1347	-	-	-
Silicide on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	1467-1469	1471	-	-
Silicide on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1473-1475	1477	-	-
Silicide on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1479-1481	1483	-	-
Silicide on tungsten	6-II	-	-	-	-	-	-	-	-	-	-	-	1485-1487	1489	-	-
Silicon carbide on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1415	-	-	-
Silicon carbide on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1411-1413	-	-	-
Silicon (mon-)oxide on aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1389	-	-
Silicon (di-)oxide on aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1391	-	-
Silicone on Inconel	6-II	-	-	-	-	-	1495	-	-	-	-	-	-	-	-	-
Silver on AISI 321	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1321	-	-
Silver on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1323	-	-
Silver sulfide on silver	6-II	-	-	-	-	-	-	-	-	-	-	1431	1433	-	-	-
Strontium titanate on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1393	-	-	-
Tantalum aluminide on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1461-1463	1465	-	-
Tantalum carbide on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1417	1419	-	-
Titanium (di-)oxide and aluminum on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	1395	-	-	-
Tungsten on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1329	1331	-	-
Tungsten on iron	6-II	-	-	-	-	-	-	-	-	-	-	1325	1327	-	-	-
Tungsten-cobalt alloys on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1341	1343	-	-
Tungsten carbide on iron	6-II	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-
Zirconium (di-)oxide on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1397	-	-
Zirconium (di-)oxide on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1399	1401	-	-
Cobalt (Co)	1	436	436	-	-	-	438	440	442	-	444	446	448-450	-	-	-
Cobalt + Chromium + ΣX_i	2-II	879, 882	879	-	-	-	-	884	886-888	890	892-906	-	908-914	916	-	-
Cobalt + Copper + ΣX_i	2-II	-	918	-	-	-	920	-	-	-	-	-	-	-	-	-
Cobalt + Gold	2-I	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-
Cobalt + Gold + ΣX_i	2-II	-	922	-	-	-	924	-	-	-	-	-	-	-	-	-

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Cobalt + Iron	2-I	-	-	-	-	80	82	84	-	-	-	-	86	-	-	88
Cobalt + Iron + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	926-930	-	-	-	-	-
Cobalt + Manganese + ΣX_i . . .	2-II	-	-	-	-	-	-	-	-	-	932	-	-	-	-	-
Cobalt + Nickel	2-I	92	-	-	-	90	-	-	-	-	-	-	94	-	-	96
Cobalt + Nickel + ΣX_i	2-II	-	-	-	-	-	-	-	934	936	938	-	-	-	-	-
Cobalt + Palladium + ΣX_i . . .	2-II	-	940	-	-	-	942-944	-	-	-	-	-	-	-	-	-
Cobalt + Vanadium	2-I	-	-	-	-	-	-	-	-	-	98	-	-	-	-	-
Cobalt alloys (special designations)																
Hastelloy 25	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
Haynes 152	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
HE 1049	2-II	-	-	-	-	-	-	884	888	-	900	-	-	-	-	-
J-1570	2-II	-	-	-	-	-	-	-	934	-	938	-	-	-	-	-
Jessop G32	2-II	879	-	-	-	-	-	-	888	-	892	-	-	-	-	-
Lohm	2-I	-	-	-	-	-	-	-	138	-	-	-	-	-	-	-
MAR-M302	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
PWA-653-A	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
Rexalloy 33	2-II	-	-	-	-	-	-	-	-	-	906	-	-	-	-	-
S-816	2-II	-	-	-	-	-	-	-	888, 934	890, 936	896, 938	-	-	-	-	-
SM-302	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
Stellites (see Stellite)																
V-36	2-II	-	-	-	-	-	-	-	-	-	896	-	-	-	-	-
Vitallium	2-II	-	879	-	-	-	-	-	-	-	894		-	-	-	-
WI-52	2-II	-	-	-	-	-	-	-	888	-	-	-	-	-	-	-
X-40	2-II	-	-	-	-	-	-	-	888	-	-	-	-	-	-	-
X-63	2-II	-	-	-	-	-	-	-	888	-	-	-	-	-	-	-
Cobalt aluminates																
$CoO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	995	-	-	-	-	-
$Co_2O_3 \cdot Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	995	-	-	-	-	-
Cobalt aluminide (CoAl)	6-I	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
Cobalt beryllide (CoBe)	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt blue glass	4-II	-	-	-	-	-	-	-	-	-	-	-	1847	1849	1851	-
Cobalt (mono-) boride (CrB) . .	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt carbide (Co_3C)	5	-	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-chromium alloys + Titanium (di-) boride cermet .	6-II	-	930	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-chromium intermetallics (CoCr)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt ferrite ($CoO \cdot Fe_2O_3$) . .	4-II	-	-	-	-	-	1071	1073	-	-	-	-	-	-	-	-
Cobalt-lead silicate glass . . .	4-II	-	-	-	-	-	1735	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Cobalt-molybdenum intermetallics (CoMo)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-niobium intermetallics (Co_6Nb_2)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt oxides																
CoO	4-I	-	-	-	-	-	-	142	-	-	146	-	-	-	-	-
Co_3O_4	4-I	-	-	-	-	-	-	144	-	-	-	-	-	-	-	-
Cobalt oxide coated tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1373-1375	-	-	-
Cobalt(ous) oxide + Copper(ic) oxide	4-I	-	-	-	-	-	-	691	-	-	-	-	-	-	-	-
Cobalt(ous) oxide + Nickel (mon-)oxide	4-I	-	-	-	-	-	-	693	-	-	-	-	-	-	-	-
Cobalt (ortho-) phosphate ($3\ CoO \cdot P_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1169	-	-	-	-	-
Cobalt phosphide (Co_2P)	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt silicides																
CoSi	6-I	-	397	-	-	-	399	401	529	-	403	-	-	-	-	-
$CoSi_2$	6-I	-	397	-	-	-	-	-	-	-	-	-	-	-	-	-
$CoSi_3$	6-I	-	397	-	-	-	-	-	-	-	-	-	-	-	-	-
Co_2Si	6-I	-	397	-	-	-	-	-	-	-	-	-	-	-	-	-
Co_3Si	6-I	-	397	-	-	-	-	-	-	-	403	-	-	-	-	-
Cobalt-titanium intermetallics																
CoTi	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
$CoTi_2$	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-tungsten intermetallics (CoW)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-zirconium intermetallics (Co_4Zr)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke, graphitized	1	105	-	-	-	-	85	-	87	-	-	-	-	-	-	-
Composite systems																
Alumina bubbles - graphite fibers system	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dexiglas paper - aluminum foil - graphite fiber system	6-II	-	-	-	-	-	-	1279	-	-	-	-	-	-	-	-
Fiberfrax paper - tantalum shield - graphite fibers system	6-II	-	-	-	-	-	-	1283	-	-	-	-	-	-	-	-
Graphite fibers - tantalum shield system	6-II	-	-	-	-	-	-	1285	-	-	-	-	-	-	-	-
Concrete	5	-	-	-	-	-	-	1281	-	-	-	-	-	-	-	-
Conolon N-1 laminate	6-II	-	-	-	-	-	-	1027	-	-	-	-	-	-	-	-
Container glasses	4-II	-	-	-	-	-	-	-	-	1174	-	-	-	-	-	-
Contracid	2-II	-	-	-	-	-	-	-	-	-	-	1833	1835	1837	-	-
Copolyvinyl chloride + Acetate	6-II	-	-	-	-	-	-	1261	-	-	-	-	-	-	-	-
								-	-	950	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Copper (Cu)	1	452	452	452	452	452	454	456	458	460	462	464	466-470	472-477	-	479
Copper, commercial coalesced .	1	452	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper DS (British aircraft material spec.)	1	-	-	-	-	-	-	-	-	-	-	-	-	472	-	-
Copper, electrolytic.	1	452	452	-	-	-	-	456	-	-	462	-	466	472	-	-
Copper, electrolytic tough pitch (Fed. Spec. QQC-502)	1	452	-	-	-	-	-	456	458	-	462	464	468	474	-	-
Copper, electrolytic tough pitch (Fed. Spec. QQC-576)	1	-	-	-	-	-	-	456	458	-	462	464	468	474	-	-
Copper, OFHC	1	-	-	-	-	-	-	-	458	460	-	-	-	-	-	-
Copper, tellurium	2-I	-	-	-	-	-	-	-	-	-	152	-	-	-	-	-
Copper coated with chrycote . .	6-II	-	-	-	-	-	-	-	-	-	-	-	1499	-	-	-
Copper coated with platinum coating	6-II	-	-	-	-	-	-	-	-	-	-	-	1313	-	-	-
Copper coating on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1301	-	-
Copper + Aluminum	2-I	100	-	-	-	-	102-104	106	108	-	110	-	-	-	-	-
Copper + Aluminum + ΣX_i . . .	2-II	-	-	-	-	-	946	-	948	-	950	952	954-958	960	-	-
Copper + Beryllium	2-I	-	-	-	-	-	-	112	-	-	-	-	-	-	-	-
Copper + Chromium	2-I	-	-	-	-	-	114	-	116	-	-	-	-	-	-	-
Copper + Chromium + ΣX_i . . .	2-II	-	-	-	-	-	962	-	964	-	-	-	-	-	-	-
Copper + Cobalt	2-I	-	-	-	-	-	-	-	118	-	-	-	-	-	-	-
Copper + Cobalt + ΣX_i	2-II	-	966	-	-	-	968	-	970-972	-	-	-	-	-	-	-
Copper + Gold																
$CuAu_3$	2-I	-	-	-	-	-	-	204	-	-	206	-	-	-	-	-
Cu_3Au	2-I	-	-	-	-	-	-	204	-	-	206	-	-	-	-	-
Copper + Iron	2-I	-	-	-	-	-	120	122	124	-	-	-	-	-	-	-
Copper + Iron + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	-	-	974	-	-	-
Copper + Lead	2-I	126	-	-	-	-	-	-	-	-	128	-	-	-	-	-
Copper + Lead + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	976	-	-	-	-	-
Copper + Manganese.	2-I	-	-	-	-	-	130	132	-	-	-	-	-	-	-	-
Copper + Manganese + ΣX_i . . .	2-II	-	-	-	-	-	978	-	980	-	-	-	-	-	-	-
Copper + Nickel	2-I	-	-	-	-	-	134	136	138	-	-	-	-	-	-	-
Copper + Nickel + ΣX_i	2-II	-	-	-	-	-	982	-	984-986	-	988	-	-	-	-	-
Copper + Palladium	2-I	-	-	-	-	-	140	-	142	-	-	-	-	-	-	-
Copper + Palladium + ΣX_i . . .	2-II	-	990	-	-	-	992	-	-	-	-	-	-	-	-	-
Copper + Platinum	2-I	-	-	-	-	-	144	-	-	-	-	-	-	-	-	-
Copper + Silicon	2-I	-	-	-	-	-	146	-	-	-	-	-	-	-	-	-
Copper + Silicon + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
Copper + Silver	2-I	-	-	-	-	-	-	-	-	-	148	-	-	-	-	-
Copper + Tellurium	2-I	150	-	-	-	-	-	-	-	-	152	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Copper + Tin	2-I	154	-	-	-	-	156	-	158	-	160	-	162	-	-	-
Copper + Tin + ΣX_i	2-II	-	-	-	-	-	-	-	996	-	998	-	-	-	-	-
Copper + Titanium	2-I	164	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper + Uranium	2-I	166	166	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper + Zinc	2-I	168	-	-	-	-	170	172	-	174	-	-	176-180	182	-	-
Copper + Zinc + ΣX_i	2-II	-	-	-	-	-	-	-	1000	-	1002-1004	-	-	-	-	-
Copper + Zirconium	2-I	184	-	-	-	-	186	-	188	-	-	-	-	-	-	-
Copper + Zirconium + ΣX_i	2-II	-	-	-	-	-	1006	-	1008	-	-	-	-	-	-	-
Copper alloys (special designations)																
Admiralty nickel	2-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
Aterite	2-II	-	-	-	-	-	-	-	-	-	1004	-	-	-	-	-
Manganin	2-II	-	-	-	-	-	978	-	-	-	-	-	-	-	-	-
Monels (see Monel)																
Ms-58	2-II	-	-	-	-	-	-	-	1000	-	-	-	-	-	-	-
Ms-77-22-2	2-II	-	-	-	-	-	-	-	1000	-	-	-	-	-	-	-
Navy "M"	2-II	-	-	-	-	-	-	-	996	-	-	-	-	-	-	-
Porosint	2-I	-	-	-	-	-	-	-	158	-	-	-	-	-	-	-
Tempaloy 836	2-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
Tempaloy 841	2-II	-	-	-	-	-	-	-	-	-	950	-	-	-	-	-
Copper ferrites																
$CuO \cdot Fe_2O_3$	4-II	-	-	-	-	-	1075	1077	-	-	-	-	-	-	-	-
$Cu_xFe_{3-x}O_4$	4-II	-	-	-	-	-	-	1077	-	-	-	-	-	-	-	-
Copper indium telluride ($CuInTe_2$)	6-I	-	-	-	-	-	-	-	572	-	-	-	-	-	-	-
Copper oxide (CuO)	4-I	-	-	-	-	-	148	150	-	-	-	-	-	-	-	152
Copper silver indium tellurides ($Ag_xCu_{1-x}InTe_2$)	6-I	-	-	-	-	-	-	-	640	-	-	-	-	-	-	-
Cordierite	4-II	-	-	-	-	-	1298	1300	1302	-	1304-1308	-	-	-	-	-
Cordierite 202	4-II	-	-	-	-	-	-	-	1302	-	-	-	-	-	-	-
Cordierite, barium-	4-II	-	-	-	-	-	-	-	-	-	1217-1221	-	-	-	-	-
Cordierite, lead-	4-II	-	-	-	-	-	-	-	-	-	1252-1254	-	-	-	-	-
Cordierite, lead-barium	4-II	-	-	-	-	-	-	-	-	-	1256-1258	-	-	-	-	-
Cordierite bodies	4-II	-	-	-	-	-	-	-	-	-	1310	-	-	-	-	-
Corning 0080 glass	4-II	-	-	-	-	-	-	-	1795	1793	-	-	-	-	-	-
Corning 1723 glass	4-II	-	-	-	-	-	-	1675	-	1677	-	-	1679	1681	1683-1685	-
Corning 7740 glass	4-II	-	-	-	-	-	-	1697	-	1701	-	-	1705	1709	1711-1713	-
Corning 7900 glass	4-II	-	-	-	-	-	-	1655	-	1661	-	-	1665	1669	1671-1673	-

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Corning 7940 glass	4-II	-	-	-	-	-	-	1655	-	-	-	-	1665	1669	1671-1673	-
Corning 8325 glass	4-II	-	-	-	-	-	-	-	-	1687	-	-	-	-	-	-
Corning 8362 glass	4-II	-	-	-	-	-	-	-	-	1749	-	-	-	-	-	-
Corning 9752 glass	4-II	-	-	-	-	-	-	-	-	-	-	-	1847	1849	1851	-
Corundum	4-I	-	-	-	-	-	-	8	-	-	22	-	-	-	-	-
Cresol resin	6-II	-	-	-	-	-	-	1004	-	-	-	-	-	-	-	-
Cristobalite	4-I	-	-	-	-	-	-	-	-	-	367	-	-	-	-	-
Crown glass	4-II	1693	1693	-	-	-	-	1697	-	-	1723	-	-	-	-	-
Crystolon-R	5	-	-	-	-	-	-	-	-	-	-	-	131, 135	-	-	-
Curium (Cm)	1	481	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D																
Dexiglas paper - aluminum foil - graphite fibers composite system	6-II	-	-	-	-	-	-	-	1283	-	-	-	-	-	-	-
Diall 50-01 resin	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diall 50-51 resin	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diall 50-52 resin	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diall 52-01 resin	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diall 52-20-30 resin	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diallylphthalate, reinforced	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diamond	1	392	392	-	-	392	-	394	396	-	398	-	-	400	-	-
Dihydroperfluorobutyl acrylate, 1, 1-	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dow-Corning XP-310 on Ti-75A (AMS 4901)	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-
Durak MG coating on molybdenum-titanium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1501-1503	-	-	-
Duranickel 301	2-II	-	-	-	-	-	-	-	-	-	1117	-	-	-	-	-
Durchy	5	-	-	-	-	-	-	-	-	-	-	-	821	-	-	-
Dures 16274	6-II	-	-	-	-	-	982	-	-	-	-	-	-	-	-	-
Dures 16694	6-II	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Duroid 5600	6-II	1097	-	-	-	-	-	-	1099	-	-	-	-	-	-	-
Dynakon rod F	6-II	-	-	-	-	-	-	-	-	-	1109	-	-	-	-	-
Dynakon sheet A3A	6-II	-	-	-	-	-	-	-	-	-	1109	-	-	-	-	-
Dysprosia	4-I	154	154	-	-	-	-	156	-	-	158	-	-	-	-	-
Dysprosium (Dy)	1	483	483	483	483	483	485	-	-	-	-	-	-	-	-	487
Dysprosium + Tantalum + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-
Dysprosium aluminate ($Dy_2O_3 \cdot 2\ Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	997	-	-	-	-	-

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Dysprosium borides																
DyB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DyB_6	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dysprosium carbide (DyC_2) . .	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dysprosium-cobalt intermetallics		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$CyCo_2$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$DyCo_5$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dysprosium hydride (DyH_3) . .	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dysprosium niobate ($Dy_2O_3 \cdot Nb_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dysprosium oxide (Dy_2O_3) . . .	4-I	154	154	-	-	-	-	-	-	-	1123	-	-	-	-	-
Dysprosium oxide + Cerium (di-)oxide	4-I	-	-	-	-	-	-	156	-	-	158	-	-	-	-	-
Dysprosium oxide + Uranium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	695	-	-	-	-	-
Dysprosium oxide + Zirconium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	697	-	-	-	-	-
Dysprosium silicide ($DySi_2$) . .	6-I	523	524	-	-	-	-	-	-	-	699	-	-	-	-	-
Dysprosium sulfides							527	-	-	-	-	-	-	-	-	-
DyS_2	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dy_2S_3	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Dy_5S_7	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
E																
Eastman Intran glasses	4-II	-	-	-	-	-	-	1853	-	-	-	-	-	-	-	-
Eccofoam	6-II	1084	-	-	-	-	-	-	1080	-	-	-	-	-	-	-
Elastomer, isocyanate polyester	6-II	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electroconducting glass	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843-1845	-
Electroconducting glass 547-26 .	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843-1845	-
Electroconducting glass LOF-81E-19778	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843-1845	-
Electroconducting glass LOF-PB-19195	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843-1845	-
Enamel on Inconel	6-II	-	-	-	-	-	1511	-	-	-	-	-	-	-	-	-
Enamel, rinsed-Mason black, on AISI 321	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1513	-	-
Enamel, spinel, coating on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1515	-	-	-
Enstatite	4-II	-	-	-	-	-	-	-	-	-	1295	-	-	-	-	-
Epoxide	6-II	1006	-	-	-	-	-	-	1010	-	1012	-	-	-	-	-
Epoxide, Hysol 6000-OP	6-II	1006	-	-	-	-	-	-	1010	1082	1012	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Epoxide, reinforced	6-II	-	-	-	-	-	-	1117	1120	1220	1122-1124	-	-	-	-	-
Epoxy, DER332	6-II	-	-	-	-	-	-	1008	-	-	-	-	-	-	-	-
Epoxy and plyophen copolymer resin, reinforced	6-II	-	-	-	-	-	-	-	1218	-	-	-	-	-	-	-
Epoxy resin	6-II	-	-	-	-	-	-	1008	-	-	-	-	-	-	-	-
Epoxy resin, reinforced	6-II	-	-	-	-	-	-	1115-1117	1120	1220	1122-1124	-	-	-	-	-
Erbia	4-I	160	-	-	-	-	-	162	-	-	164	-	166	-	-	-
Erbium (Er)	1	489	489	489	489	489	491	493	-	-	495	-	497	-	-	499
Erbium borides																
ErB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ErB_6	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium carbide (ErC_2)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium-cobalt intermetallics ($ErCo_5$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium-gallium intermetallics ($ErGa_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium hydride (ErH_3)	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium-manganese intermetallics ($ErMn_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium-nickel intermetallics ($ErNi_5$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium oxide (Er_2O_3)	4-I	160	-	-	-	-	-	162	-	-	164	-	166	-	-	-
Erbium selenides																
ErSe	6-I	-	-	-	-	-	367	-	-	-	-	-	-	-	-	-
Er_2Se_3	6-I	-	-	-	-	-	367	-	-	-	-	-	-	-	-	-
Erbium-silver intermetallics (ErAg)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium sulfides																
ErS	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Er_2S_3	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Er_3S_7	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium tellurides (Er_2Te_3)	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Ethyl cellulose	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Etruria Marl	4-I	-	-	-	-	-	-	-	-	-	802-812	-	-	-	-	-
Eucryptite	4-II	-	-	-	-	-	-	-	-	-	1270	-	-	-	-	-
Europium (Eu)	1	501	501	501	501	501	503	505	-	-	-	-	-	-	-	507
Europium (hexa-) boride (EuB_6)	6-I	296	-	-	-	-	300	-	-	-	-	-	-	-	-	-
Europium oxide (Eu_2O_3)	4-I	168	168	-	-	-	-	170	-	-	172	-	-	-	-	-
Europium oxide + Iron-chromium alloy cermet	6-II	-	-	-	-	-	-	-	-	-	786	-	-	-	-	-
Europium silicide ($EuSi_2$)	6-I	523	524	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Europium sulfides																
EuS	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EuS_2	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eu_3S_4	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Evanohm	2-II	1119	-	-	-	-	1124	-	-	-	-	-	-	-	-	-
F																
Fabrics																
Fiber glass	6-II	-	-	-	-	-	-	-	-	1269	-	-	-	-	-	-
Graphite	6-II	-	-	-	-	-	-	-	-	1271	-	-	-	-	-	-
Nylon	6-II	-	-	-	-	-	-	-	-	1273	-	-	-	-	-	-
Organic fiber	6-II	-	-	-	-	-	-	-	-	1275	-	-	-	-	-	-
Silica	6-II	-	-	-	-	-	-	-	-	1277	-	-	-	-	-	-
Feldspars																
Barium	4-II	-	-	-	-	-	-	1205	-	-	1207	-	-	-	-	-
Calcium	4-II	-	-	-	-	-	-	-	-	-	1235	-	-	-	-	-
Lithium	4-II	-	-	-	-	-	-	-	1266	-	1270	-	-	-	-	-
Lithium-potassium	4-II	-	-	-	-	-	-	-	-	-	1283	-	-	-	-	-
Sodium	4-II	-	-	-	-	-	-	-	-	-	1326	-	-	-	-	-
Sodium-potassium	4-II	-	-	-	-	-	-	-	-	-	1330	-	-	-	-	-
Strontium	4-II	-	-	-	-	-	-	-	-	-	1334	-	-	-	-	-
Ferramic E	4-II	-	-	-	-	-	-	1093	-	-	-	-	-	-	-	-
Ferroferric oxide + Iron(ic) oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	715	-	-	-
Fiber cermets	6-II	928	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fiber glass fabrics	6-II	-	-	-	-	-	-	-	-	1269	-	-	-	-	-	-
Fiberfrax paper - tantalum shield - graphite fibers composite system	6-II	-	-	-	-	-	-	-	1285	-	-	-	-	-	-	-
Fiberite 4030-190	6-II	-	-	-	-	-	1103	-	-	-	-	-	-	-	-	-
Firebricks																
Alumina	4-I	-	-	-	-	-	613	-	621	-	-	-	-	-	-	-
ASTM group no. 16 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 20 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 23 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 26 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 28 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 30 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
Egyptian	4-I	-	-	-	-	-	-	-	798	800	-	-	-	-	-	-
Firebricks	4-I	-	-	-	-	-	-	-	798	789, 800	-	-	-	-	-	-
K-28 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
Siliceous	5	-	-	-	-	-	-	-	-	-	-	-	1043	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Flint container glass.	4-II	-	-	-	-	-	-	-	-	-	-	-	1799	1801	1729	-
Flint glass	4-II	-	-	-	-	-	-	1829	-	-	-	-	-	-	-	-
Fluorothene	6-II	1030	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
FM-5064 graphite-phenolic laminates	6-II	-	-	-	-	-	-	1140	-	-	-	-	-	-	-	-
Forsterite	4-II	1285	1285	-	-	-	1287	-	1291	-	-	-	-	-	-	-
Forsterite 243	4-II	1285	1285	-	-	-	-	-	-	-	-	-	-	-	-	-
Forsterite-stainless steel laminates	6-II	-	-	-	-	-	-	-	1221	-	-	-	-	-	-	-
Fortical 28227	6-II	-	-	-	-	-	-	-	-	-	944	-	-	-	-	-
Fortical 28238	6-II	-	-	-	-	-	-	-	-	-	944	-	-	-	-	-
Fresco FR0020	6-II	-	-	-	-	-	-	1214	-	-	-	-	-	-	-	-
FRLG 2502-1	6-II	-	-	-	-	-	-	-	-	1277	-	-	-	-	-	-
Furfural formaldehyde, wood flour filled	6-II	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	-
G																
Gadolinia	4-I	174	174	-	-	-	-	176	178	-	180	-	182	-	-	-
Gadolinum (Gd)	1	509	509	509	509	509	511	-	-	-	513	-	-	-	-	-
Gadolinium + Tantalum	2-I	-	-	-	-	-	-	-	-	-	190	-	-	-	-	-
Gadolinium borides																
GdB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GdB_6	6-I	295	296	-	-	-	300	-	-	-	-	-	-	-	-	-
Gadolinium carbides																
GdC_2	5	294	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium-cobalt intermetallics																
GdCo	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCo_2$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCo_3$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCo_4$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCo_5$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2Co_3	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_3Co	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium-copper intermetallics																
GdCu	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCu_4$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdCu_5$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium ferrides																
$GdFe_3$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdFe_4$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GeFe_5$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2Fe_3	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Gadolinium ferrides (cont.)																
Gd_2Fe_7	6-II	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium (tri-) fluoride (GdF_3)	5	-	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium-gallium intermetallics ($GdGa_2$)	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium hydrides																
GdH_2	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GdH_3	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium-nickel intermetallics																
GdNi	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdNi_2$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdNi_3$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdNi_4$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$GdNi_5$	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2Ni_7	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2Ni_{17}	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_3Ni	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_3Ni_2	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium-osmium intermetallics (Gd_2Os_3)	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium oxide (Gd_2O_3)	4-I	174	174	-	-	-	-	176	178	-	180	-	182	-	-	-
Gadolinium selenides																
GdSe	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2Se_3	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_3Se_4	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium silicides ($GdSi_2$)	6-I	523	-	-	-	-	527	-	-	-	-	-	-	-	-	-
Gadolinium-silver intermetallics (GdAg)	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium sulfides																
GdS_2	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd_2S_3	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadolinium tellurides																
Gd_2Te	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Gd_2Te_3	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Gadolinium-yttrium-cobalt intermetallics ($Gd_{1-x}Y_xCo_5$)	6-I	665	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Galena	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gallium antimonide (GaSb)	6-I	-	-	-	-	-	51	53	-	-	-	-	688	-	-	-
Gallium arsenide (GaAs)	6-I	-	-	-	-	-	-	83	-	85	-	-	-	-	-	-
Gallium (sesqui-) oxide (Ga_2O_3)	4-I	-	-	-	-	-	-	184	-	-	-	-	-	-	-	-
Gallium phosphide (GaP)	5	-	-	-	-	-	-	629	-	-	-	-	-	-	-	-
Gallium telluride (Ga_2Te_3)	6-I	-	-	-	-	-	-	574	-	-	-	-	-	-	-	-
Gehlenite	4-II	-	-	-	-	-	-	1233	-	-	1235	-	-	-	-	-

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German Flake	1	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-
	2-II	841	-	-	-	-	-	-	845	-	-	-	-	-	-	-
Germanium (Ge)	1	515	515	515	515	515	517	519	521	524	526	-	528-530	-	-	532
Germanium + Silicon	2-I	192	-	-	-	-	194	-	-	-	-	-	-	-	-	-
Germanium bismuth telluride ($Ge_{1-x}Bi_xTe$)	6-I	-	-	-	-	-	582	-	584	-	-	-	-	-	-	-
Germanium (di-)oxide (GeO_2)	4-I	-	-	-	-	-	-	186	-	-	188	-	-	-	-	190
Germanium oxide glass	4-II	1637	-	-	-	-	-	1639	-	-	-	-	-	-	-	-
Germanium silicide (GeSi)	6-I	-	-	-	-	-	-	405	-	-	-	-	-	-	-	-
Germanium telluride (GeTe)	6-I	-	-	-	-	-	576	-	578	-	-	-	-	-	-	580
Germanium telluride + Silver antimony telluride	6-I	-	-	-	-	-	715	-	-	-	-	-	-	-	-	-
Glasses (see individual glasses)																
Glass ceramics (see also pyroceram)	4-II	-	-	-	-	-	-	1587	1589	1591	-	-	1593-1599	1601	1603	-
Glucina	4-I	-	-	-	-	-	57	-	-	-	-	-	-	-	-	-
GMGA 5003 silicone	6-II	-	-	-	-	-	1070	-	-	-	-	-	-	-	-	-
Gold (Au)	1	534	534	-	-	534	536	538	540	-	542	544-546	548	550-552	-	554
Gold coating on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1303	1305	-	-
Gold coating on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1307	-	-
Gold + Cadmium	2-I	196	196	196	-	-	198	-	-	-	-	-	-	-	-	200
Gold + Cobalt	2-I	-	-	-	-	-	202	-	-	-	-	-	-	-	-	-
Gold + Cobalt + ΣX_i	2-II	-	1012	-	-	-	1014	-	-	-	-	-	-	-	-	-
Gold + Copper	2-I	-	-	-	-	-	-	204	-	-	206	-	-	-	-	-
Gold + Copper + ΣX_i	2-II	-	-	-	-	-	1016	-	-	-	-	-	-	-	-	-
Gold + Iron	2-I	208	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold + Manganese	2-I	210	-	-	-	-	212	-	-	-	-	-	-	-	-	-
Gold + Nickel	2-I	214	-	-	-	-	-	216	-	-	-	-	-	-	-	-
Gold + Palladium	2-I	-	-	-	-	-	218	-	-	-	220	-	-	-	-	-
Gold + Palladium + ΣX_i	2-II	-	1018	-	-	-	1020	-	-	-	-	-	-	-	-	-
Gold + Platinum	2-I	-	-	-	-	-	222	-	-	-	-	-	-	-	-	-
Gold + Silver	2-I	-	-	-	-	-	-	-	-	-	224	-	226	-	-	228
Gold + Uranium	2-I	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold + Zinc	2-I	-	232	232	-	-	-	-	-	-	-	-	-	234	-	-
Gold alloy (special designations)																
Palau	2-I	-	-	-	-	-	-	-	-	-	220	-	-	-	-	-
Gold-manganese intermetallics (Au_2Mn)	6-I	-	-	-	-	-	648	-	-	-	-	-	-	-	-	-
Gold-titanium intermetallics (Au_2Ti)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold-zirconium intermetallics (Au_3Zr)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-

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Goodyear foam-inplace.	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-	-	-
Graphites (Special designations)																
Grade 580	1	-	-	-	-	-	-	-	-	-	-	-	110-112	-	-	-
Grade 896G	1	-	-	-	-	-	371	-	-	-	114	-	-	-	-	-
Grade 942S	1	-	-	-	-	-	371	-	-	-	116	-	-	-	-	-
Grade 3474D	1	-	-	-	-	-	371	118	120	-	122	124	126-128	130	-	-
Grade 3499	1	-	-	-	-	-	371	-	-	-	132	-	-	-	-	-
Grade 7087	1	105	-	-	-	-	-	134	136	138	140	142	144-146	148	-	-
Grade 7100	1	-	-	-	-	-	-	-	-	-	-	-	150-152	-	-	-
Grade AGHT	1	-	-	-	-	-	-	-	154	-	-	-	-	-	-	-
Grade AGKSP	1	-	-	-	-	-	-	-	-	-	-	-	156	158	-	-
Grade AGKT	1	-	-	-	-	-	371	-	-	-	-	-	-	-	-	-
Grade AGOT	1	-	-	-	-	-	160	-	162	-	165	-	-	-	-	-
Grade AGOT-CSF.	1	-	-	-	-	-	160	-	-	-	-	-	-	-	-	-
Grade AGOT-KC	1	-	-	-	-	-	160	-	-	-	-	-	-	-	-	-
Grade AGR	1	-	-	-	-	-	371	-	-	-	167	-	-	-	-	-
Grade AGX	1	-	-	-	-	-	-	-	-	-	169	-	171	-	-	-
Grade ATJ	1	103	-	-	-	-	371	175	177	-	179	-	182-188	190	-	-
Grade ATL-82	1	-	-	-	-	-	-	-	192	-	194	-	-	-	-	-
Grade AUC	1	-	-	-	-	-	-	-	-	-	-	-	196-198	200	-	-
Grade AWG	1	-	-	-	-	-	202	-	204	-	-	-	-	-	-	-
Grade CEP	1	-	-	-	-	-	-	-	-	-	206	-	-	-	-	-
Grade CFW	1	-	-	-	-	-	208	-	-	-	210	-	-	-	-	-
Grade CFZ	1	-	-	-	-	-	-	-	-	-	212	-	-	-	-	-
Grade CS	1	-	-	-	-	-	371	214	216	218	-	-	-	-	-	-
Grade CSF	1	-	-	-	-	-	-	-	220	-	222	-	-	-	-	-
Grade EH	1	-	-	-	-	-	371	-	-	-	224	-	-	-	-	-
Grade GBE	1	-	-	-	-	-	-	-	226	-	228	230	232-234	236	-	-
Grade GBH	1	105	-	-	-	-	-	238	240	-	242	244	246-248	250	-	-
Grade H1LM	1	-	-	-	-	-	-	-	-	-	-	-	252-254	-	-	-
Grade H3LM	1	-	-	-	-	-	371	-	-	-	256	-	258-260	-	-	-
Grade H4LM	1	-	-	-	-	-	-	-	262	-	264	-	-	-	-	-
Grade MH4LM	1	-	-	-	-	-	-	-	266	-	-	-	-	-	-	-
Grade NT-0005	1	-	-	-	-	-	371	-	-	-	349	-	-	-	-	-
Grade R-0008	1	-	-	-	-	-	268	-	270	-	-	-	-	-	-	-
Grade R-0025	1	-	-	-	-	-	-	-	272	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Graphites (special design.) (cont)																
Grade RT-0003	1	-	-	-	-	-	-	-	274	-	-	-	-	-	-	-
Grade RVA	1	-	-	-	-	-	-	-	-	-	276	-	-	-	-	-
Grade RVC	1	-	-	-	-	-	-	-	-	-	278	-	-	-	-	-
Grade RVD	1	-	-	-	-	-	-	-	-	-	280	-	-	-	-	-
Grade SA-25	1	-	-	-	-	-	-	-	282	-	-	-	-	-	-	-
Grade SPK	1	-	-	-	-	-	-	-	-	-	-	-	284	286	-	-
Grade TS	1	-	-	-	-	-	-	-	-	-	288	-	-	-	-	-
Nuclear grade TSP	1	-	-	-	-	-	-	-	290	-	-	-	-	-	-	-
Grade TSX	1	-	-	-	-	-	-	-	-	-	292	-	-	-	-	-
Grade W	1	-	-	-	-	-	-	-	294	-	296	-	-	-	-	-
Grade WSF	1	-	-	-	-	-	-	-	-	-	298	-	-	-	-	-
Grade ZT	1	-	-	-	-	-	300	-	302	-	-	-	-	-	-	-
Grade ZT-5001	1	-	-	-	-	-	-	-	302	-	-	-	-	-	-	-
Grade ZTA	1	-	-	-	-	-	-	-	-	-	305	-	-	-	-	-
Grade ZTB	1	-	-	-	-	-	-	-	-	-	307	-	-	-	-	-
Grade ZTC	1	-	-	-	-	-	-	-	-	-	309	-	-	-	-	-
Grade ZTD	1	-	-	-	-	-	-	-	-	-	311	-	-	-	-	-
Grade ZTE	1	-	-	-	-	-	-	-	-	-	313	-	-	-	-	-
Grade ZTF	1	-	-	-	-	-	-	-	-	-	315	-	-	-	-	-
Graphites, others																
Artificial grades	1	-	-	-	-	-	-	-	360	-	363	-	-	-	-	-
Carbon impregnated	1	-	-	-	-	-	-	-	358	-	-	-	-	-	-	-
Ceylon graphite	1	-	-	-	-	-	352	-	354	-	356	-	-	-	-	-
Coated with grade W graphite	1	-	-	-	-	-	-	-	294	-	296	-	-	-	-	-
Coated with silicon carbide	1	-	-	-	-	-	-	-	-	-	-	-	386	-	-	-
Cumberland graphite	1	-	-	-	-	-	352	-	354	-	-	-	-	-	-	-
Electrode	1	-	-	-	-	-	-	-	360	-	-	-	365	-	-	-
Experimental grades	1	-	-	-	-	-	337	-	339	343	349	-	-	-	-	-
Flake	1	-	-	-	-	-	-	-	-	-	369	-	-	-	-	-
Great Lakes base stock grades	1	-	-	-	-	-	-	-	-	-	381	-	-	-	-	-
Great Lakes end-cap grades	1	-	-	-	-	-	-	-	-	-	381	-	-	-	-	-
Great Lakes impervious grades	1	-	-	-	-	-	-	-	-	-	381	-	-	-	-	-
Hilger H. S. grade	1	-	-	-	-	-	352	-	354	-	-	-	-	-	-	-
Karbate	1	-	-	-	-	-	-	-	358	-	-	-	-	-	-	-
Lampblack-base	1	-	-	-	-	-	-	-	367	-	-	-	-	-	-	-
Natural graphite-base	1	-	-	-	-	-	352	-	354	-	-	-	-	-	-	-
Pyrolytic	1	-	-	-	-	-	-	-	317	-	319	-	325-331	333-335	-	-
Pyrolytic coating on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	573-575	-	-	-
Pyrolytic, nucleated and regenerative	1	-	-	-	-	-	-	-	-	-	319	-	-	-	-	-
Silicon carbide bonded	1	-	-	-	-	-	-	-	-	-	-	-	386	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Graphites, others (cont.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified grades	1	105	105	-	-	105	371	375	377	379	383	-	386-388	-	-	390
Graphite + Silicon carbide	5	-	-	-	-	-	-	737	-	-	-	-	-	-	-	-
Graphite + Thorium (di-) oxide	5	-	-	-	-	-	-	-	739	-	-	-	-	-	-	-
Graphite + Uranium (di-) carbide	5	-	-	-	-	-	-	-	743	-	-	-	-	-	-	-
Graphite + Uranium (di-) oxide	5	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
Graphite + Zirconium (pyro-) - carbide	5	-	-	-	-	-	-	-	-	-	745	-	-	-	-	-
Graphite fabric	6-II	-	-	-	-	-	-	-	-	1271	-	-	-	-	-	-
Graphite cloth laminates																
PT-0110	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0111	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0113	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0114	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0154	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0156	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
Graphite fibers - tantalum shield composite system	6-II	-	-	-	-	-	-	-	1281	-	-	-	-	-	-	-
Graphite-phenolic laminate FM-5064	6-II	-	-	-	-	-	-	1140	-	-	-	-	-	-	-	-
Gray cast iron	3	-	-	-	-	-	-	-	29-33	-	39	-	-	-	-	-
Gray cast iron, ferritic base	3	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-
Gray cast iron, pearlitic base	3	-	-	-	-	-	-	-	31	-	-	-	-	-	-	-
H																
Hafnia	4-I	192	192	-	-	-	194	196	198	-	200	-	202	-	-	204
Hafnium (Hf)	1	556	556	-	-	-	558	560	-	-	562	-	-	-	-	-
Hafnium + Zirconium	2-I	236	236	-	-	-	238	240	242	-	244	-	-	-	-	246
Hafnium antimonide (HfSb)	6-I	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-
Hafnium beryllide (Hf_2Be_{21})	6-I	-	-	-	-	-	-	98	-	-	100	-	-	-	-	-
Hafnium (di-) boride (HfB_2)	6-I	170	170	-	-	-	172	174	176	-	178	-	180	-	-	-
Hafnium carbide (HfC)	5	49	49	-	-	-	51	53	55	57	59	-	61	-	-	-
Hafnium carbide + Zirconium cermet	6-II	-	-	-	-	-	-	-	-	-	852	-	-	-	-	-
Hafnium-chromium intermetallics ($HfCr_2$)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium-cobalt intermetallics ($HfCo_2$)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium ferrides ($HfFe_2$)	6-I	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium fluoride (HfF_4)	5	-	-	-	-	-	-	367	-	-	-	-	-	-	-	-
Hafnium germanide (HfGe)	6-I	-	-	-	-	-	325	-	-	-	-	-	-	-	-	-
Hafnium-manganese intermetallics ($HfMn_2$)	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-

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Hafnium-molybdenum intermetallics ($HfMo_2$)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium-nickel intermetallics ($HfNi_2$)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium nitride (HfN)	5	517	517	-	-	-	519	521	523	-	525	-	527-529	-	-	531
Hafnium (di-)oxide (HfO_2)	4-I	192	192	-	-	-	194	196	198	-	200	-	202	-	-	204
Hafnium (di-)oxide coating on tungsten	6-II	-	-	-	-	-	-	-	-	-	-	-	1377-1379	-	-	-
Hafnium (di-)oxide + ΣX_i	4-I	-	-	-	-	-	-	-	-	-	711	-	-	-	-	-
Hafnium (di-)oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	-	-	701	-	-	-	-	-
Hafnium (di-)oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	-	-	703	-	-	-	-	-
Hafnium (di-)oxide + Tantalum (pent-)oxide	4-I	-	-	-	-	-	-	-	-	-	705	-	-	-	-	-
Hafnium (di-)oxide + Titanium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	707	-	-	-	-	-
Hafnium (di-)oxide + Titanium (di-)oxide + Zirconium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	709	-	-	-	-	-
Hafnium selenide (HfSe)	6-I	-	-	-	-	-	331	-	-	-	-	-	-	-	-	-
Hafnium silicate ($HfO_2 \cdot SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1241	-	-	-	-	-
Hafnium silicides																
HfSi	6-I	-	524	-	-	-	-	-	-	-	-	-	-	-	-	-
$HfSi_2$	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnium tellurides (HfTe)	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Hafnium-vanadium intermetallics (HfV_2)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Hafnon	4-II	-	-	-	-	-	-	-	-	-	1241	-	-	-	-	-
Hamilton standard foam-inplace.	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-	-	-
Hastelloy 25	2-II	-	-	-	-	-	-	-	-	-	898	-	-	-	-	-
Hastelloy 500	2-II	-	-	-	-	-	-	-	-	-	1154	-	-	-	-	-
Hastelloy A	2-II	-	-	-	-	-	-	-	1261	-	-	-	-	-	-	-
Hastelloy B	2-II	1277	1275	-	-	-	-	1279	1281	-	1287	1289	1293-1295	1297	-	-
Hastelloy C	2-II	1119	-	-	-	-	-	1130	1136	-	1166	-	-	-	-	-
Hastelloy C (AMS-5530)	2-II	1277	-	-	-	-	-	-	1281	-	1283	1289	1291-1295	1297	-	-
Hastelloy C (AMS-5530C)	2-II	-	-	-	-	-	-	-	-	-	-	1289	1293	1297	-	-
Hastelloy C coating on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1337	-	-	-
Hastelloy D	2-II	-	-	-	-	-	-	-	-	-	1301	-	-	-	-	-
Hastelloy F	2-II	-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Hastelloy N	2-II	1277	-	-	-	-	-	-	1281	-	1283	-	-	-	-	-
Hastelloy R-235	2-II	1122	-	-	-	-	-	1128	1136-1138	-	1161	-	-	-	-	-

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Hastelloy X	2-II	1119, 1257	-	-	-	-	-	-	1134, 1261	-	1164	-	1172, 1189	1203	-	-
Hastelloy X coating on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1339	-	-	-
Hematite	4-I	-	-	-	-	-	214	218	-	-	222	-	-	224	-	-
Hidurel 6	2-II	-	-	-	-	-	962	-	964	-	-	-	-	-	-	-
Holmia	4-I	-	-	-	-	-	-	206	-	-	208	-	-	-	-	-
Holmium (Ho)	1	564	564	564	564	564	566	-	-	-	-	-	-	-	-	-
Holmium borides																
HoB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HoB_6	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium carbides																
HoC_2	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ho_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium-cobalt intermetallics																
$HoCo_2$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$HoCo_5$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium ferrides																
$HoFe_2$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$HoFe_5$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium-gallium intermetallics ($HoGa_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium-manganese intermetallics																
$HoMn_2$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$HoMn_5$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium-nickel intermetallics																
$HoNi_2$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$HoNi_5$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holmium oxide (Ho_2O_3)	4-I	-	-	-	-	-	-	206	-	-	208	-	-	-	-	-
Honeycombs																
17-7PH stainless steel skin and core	6-II	-	-	-	-	-	-	1236	1230	-	1234	-	-	-	-	-
2024 T-3 aluminum alloy skin and core	6-II	-	-	-	-	-	-	1236	1230	-	1232	-	-	-	-	-
2024 T-3 aluminum alloy skin and alkyd isocyanate foam core	6-II	-	-	-	-	-	-	1236	1239	-	1243	-	-	-	-	-
2024 T-3 aluminum alloy skin and phenolic core	6-II	-	-	-	-	-	-	1236	1239	-	1241	-	-	-	-	-
Metal skin and metal core	6-II	-	-	-	-	-	-	1236	1230	-	1232-1234	-	-	-	-	-
Plastic and metal composites	6-II	-	-	-	-	-	-	1236	1239	-	1241-1245	-	-	-	-	-
Plastic skin and plastic core	6-II	-	-	-	-	-	-	-	1247-1253	-	-	-	-	-	-	-

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Honeycombs (cont.)																
Polyester P-43 resin skin and 2024 T-3 aluminum alloy core	6-II	-	-	-	-	-	-	1236	1239	-	1245	-	-	-	-	-
Polyester resin no. P-43 skin and polyester honeycomb core	6-II	-	-	-	-	-	-	1236	-	-	-	-	-	-	-	-
Polyester resin skin and epoxy resin core	6-II	-	-	-	-	-	-	-	1247	-	-	-	-	-	-	-
Polyester resin skin and phenolic resin core	6-II	-	-	-	-	-	-	-	1247	-	-	-	-	-	-	-
Polyester Vibrin 135 and 181 fabric faces and phenolic core	6-II	-	-	-	-	-	-	1236	-	-	-	-	-	-	-	-
TAC polyester Vibrin 135 and 181 fabric skin and alkyd isocyanate foam core	6-II	-	-	-	-	-	-	-	-	-	1249	-	-	-	-	-
Reinforced polyester skin and polyester core	6-II	-	-	-	-	-	-	-	-	-	1253	-	-	-	-	-
Hysol 6000-CP epoxide	6-II	1006	-	-	-	-	-	-	1010	1082	1012	-	-	-	-	-
I																
Igelit-PCU	6-II	-	-	-	-	-	-	1078	1086	1082	-	-	-	-	-	-
Ilmenite	4-II	-	-	-	-	-	1427	1429	-	-	1431	-	-	-	-	-
Incoloy	3	-	-	-	-	-	-	383	-	-	-	-	-	-	-	-
Incoloy 713C	2-II	-	-	-	-	-	-	1126	1140	-	1152	-	-	-	-	-
Incoloy 800	3	-	-	-	-	-	-	-	-	-	405	-	-	-	-	-
Incoloy 801	3	-	-	-	-	-	-	-	-	-	405	-	-	-	-	-
Incoloy 804	2-II	-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Incoloy 825	2-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
Incoloy 901	2-II	-	-	-	-	-	-	1259	1261	-	-	-	-	-	-	-
Incoloy T	3	-	-	-	-	-	-	-	-	-	405	-	-	-	-	-
Inconel	2-II	1119	1119	-	-	-	1124	1128	1140, 1144, 1145	1148	1158, 1161	-	1172, 1177, 1191	-	-	-
Inconel coated with enamel	6-II	-	-	-	-	-	1151	-	-	-	-	-	-	-	-	-
Inconel coated with NBS coating A-418	6-II	-	-	-	-	-	-	-	-	-	-	-	1361-1363	-	-	-
Inconel coated with NBS coating N-143	6-II	-	-	-	-	-	-	-	-	-	-	-	1353-1355	-	-	-
Inconel coated with nickel aluminides	6-II	-	-	-	-	-	-	-	-	-	-	-	1453-1455	1457	-	-
Inconel coated with silicone	6-II	-	-	-	-	-	1495	-	-	-	-	-	-	-	-	-
Inconel coated with zirconium (di-)oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1397	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Inconel 600	2-II	1219, 1307	-	-	-	-	-	-	1223, 1313	-	1158	-	-	-	-	-
Inconel 604	2-II	-	-	-	-	-	-	-	-	-	1158	-	-	-	-	-
Inconel 625	2-II	-	-	-	-	-	-	-	-	-	1166	-	-	-	-	-
Inconel 700	2-II	-	-	-	-	-	-	-	1223	-	1227	-	-	-	-	-
Inconel 702	2-II	-	1119	-	-	-	-	1128	1144	-	1152	-	1193	1205	-	-
Inconel 718	2-II	-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Inconel 721	2-II	-	-	-	-	-	-	-	-	-	1158	-	-	-	-	-
Inconel 722	2-II	-	-	-	-	-	-	-	-	-	1158	-	-	-	-	-
Inconel B	2-II	-	-	-	-	-	-	-	-	-	-	-	1[illegible]	-	-	-
Inconel M	2-II	-	-	-	-	-	-	-	-	-	1158	-		-	-	-
Inconel W	2-II	-	-	-	-	-	-	-	-	-	1158	-	-	-	-	-
Inconel X	2-II	1119	1119	-	-	-	1124	1128	1140	1148	1158	-	1172, 1177, 1186, 1195	1207	-	-
Inconel X coated with boron carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1403	1405	-	-
Inconel X coated with nickel-chromium alloy	6-II	-	-	-	-	-	-	-	-	-	-	-	1333	1335	-	-
Inconel X coated with tantalum carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1417	1419	-	-
Inconel X coated with tungsten	6-II	-	-	-	-	-	-	-	-	-	-	-	1329	1331	-	-
Inconel X coated with tungsten-cobalt alloy	6-II	-	-	-	-	-	-	-	-	-	-	-	1341	1343	-	-
Inconel X coated with zirconium (di-) oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	1399	1401	-	-
Inconel X 750	2-II	1122	-	-	-	-	-	-	1140	-	1158	-	-	-	-	-
Index rod (gas baked coke)	1	-	-	-	-	-	85	-	87	-	-	-	-	-	-	-
Indium antimonide (InSb)	6-I	-	-	-	-	-	57	59	61	63	65	-	-	-	-	-
Indium arsenide (InAs)	6-I	-	-	-	-	-	87	89	91	-	-	-	-	-	-	-
Indium bismuth selenide ($InBiSe_3$)	6-I	-	-	-	-	-	333	-	-	-	-	-	-	-	-	-
Indium (sesqui-) oxide (In_2O_3)	4-I	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
Indium phosphide (InP)	5	-	-	-	-	-	631	633	-	-	-	-	-	-	-	-
Indium telluride (In_2Te_3)	6-I	-	-	-	-	-	586	-	588	-	-	-	-	-	-	-
Inquartation silver	1	-	-	-	-	-	-	904	-	-	-	-	-	-	-	-
Insulating bricks (see bricks)																
Insulating firebricks (see firebricks)																
Insurok C-T-601	6-II	1128	-	-	-	-	-	1142	-	-	-	-	-	-	-	-
Insurok XXX-T-640	6-II	1128	-	-	-	-	-	1142	-	-	-	-	-	-	-	-
Intermetallics (see each individual intermetallics)																
Inverse spinel	4-I	-	-	-	-	-	-	691-693	-	-	-	-	-	-	-	-
Iodide titanium	1	-	993	-	-	-	996	999	1001	-	1005	-	-	-	-	1017

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Iodide zirconium	1	-	1099	-	-	-	1102	1104	1106	-	1111	-	-	-	-	-
Iridium (Ir)	1	568	568	-	-	568	570	572	574	-	-	-	576	-	-	-
Iridium + Rhodium	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248
Iridium (tri-) silicide ($IrSi_3$)	6-I	-	-	-	-	-	407	-	-	-	-	-	-	-	-	-
Iron (Fe)	1	578	578	578	-	578	581	583	585	587	589	592	594-600	602	-	604
Iron, Armco	1	578	-	-	-	-	581	583	585	587	589	592	594, 598	602	-	-
Iron, electrolytic	1	-	578	-	-	578	581	583	-	-	589	-	-	-	-	604
Iron, Svea	1	-	-	-	-	-	-	-	585	-	-	-	-	-	-	-
Iron coated with chromium carbide - cobalt blend	6-II	-	-	-	-	-	-	-	-	-	-	1407	1409	-	-	-
Iron coated with molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	1309	1311	-	-	-
Iron coated with tungsten	6-II	-	-	-	-	-	-	-	-	-	-	1325	1327	-	-	-
Iron coated with tungsten carbide	6-II	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-
Iron + ΣX_i	3	461	-	-	-	-	463	-	465	-	-	-	-	-	-	-
Iron + Aluminum + ΣX_i	3	45	-	-	-	-	47-51	-	-	-	-	-	-	-	-	-
Iron + Carbon + ΣX_i (C ≤2.00)	3	-	-	-	-	3	5	7-10	-	12-14	16-20	-	-	-	-	22
Iron + Carbon + ΣX_i (C >2.00)	3	27	-	-	-	-	-	-	29-37	-	39-41	-	-	-	-	-
Iron + Chromium + ΣX_i	3	55	53	-	-	-	57-63	65-77	79-83	85-94	96-118	120	122-134	136-138	-	-
Iron + Chromium + Nickel + + ΣX_i	3	140, 145	140-141	-	-	-	147-153	155-164	166-180	182-193	195-227	229-231	233-272	274-286	-	-
Iron + Cobalt + ΣX_i	3	-	-	-	-	-	288-290	292-294	296	298	300	-	-	302	-	-
Iron + Copper + ΣX_i	3	-	-	-	-	-	304	306	308	-	-	-	-	-	-	-
Iron + Manganese + ΣX_i	3	310	-	-	-	-	312-314	316-323	325-327	329-333	335-343	-	345-347	349	-	-
Iron + Molybdenum + ΣX_i	3	-	-	-	-	-	-	-	351	-	353	-	-	-	-	-
Iron + Nickel + ΣX_i	3	-	-	-	-	-	355	357-359	361-363	365	367-377	-	-	-	-	-
Iron + Nickel + Chromium + + ΣX_i	3	379	-	-	-	-	381	383	385-393	395-397	399-407	-	409-411	413	-	-
Iron + Platinum + ΣX_i	3	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-
Iron + Silicon + ΣX_i	3	-	-	-	-	-	417-419	421-425	427-437	-	439-442	-	-	-	-	-
Iron + Tellurium + ΣX_i	3	-	-	-	-	-	-	446	-	-	-	-	-	-	-	-
Iron + Titanium + ΣX_i	3	-	-	-	-	-	-	448	-	-	-	-	-	-	-	-
Iron + Tungsten + ΣX_i	3	-	-	-	-	-	-	-	450	-	452	-	454	-	-	-
Iron + Vanadium + ΣX_i	3	-	-	-	-	-	456-458	-	-	-	-	-	-	-	-	-
Iron alloys (see cast irons and steels for special design.)																

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Iron aluminates																
$FeO \cdot Al_2O_3$	4-II	-	-	-	-	-	-	999	-	-	-	-	-	-	-	-
$Fe_2O_3 \cdot 2\,Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	1001	-	-	-	-	-
Iron beryllide ($FeBe_2$)	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron borides																
FeB	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Fe_2B	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron carbide (Fe_3C)	5	63	63	-	-	-	-	65	-	-	-	-	-	-	-	-
Iron chromites																
$FeO \cdot Cr_2O_3$	4-II	-	-	-	-	-	-	1051	-	-	1053	-	-	-	-	-
$Fe_2O_3 \cdot 2\,Cr_2O_3$	4-II	-	-	-	-	-	-	-	-	-	1053	-	-	-	-	-
Iron cobaltite ($FeO \cdot Co_2O_3$)	4-II	-	-	-	-	-	-	1065	-	-	-	-	-	-	-	-
Iron lead silicate glass	4-II	-	-	-	-	-	1737	-	-	-	-	-	-	-	-	-
Iron-niobium intermetallics (Fe_3Nb_3)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron nitride (Fe_4N)	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron oxides																
FeO	4-I	-	-	-	-	-	-	216	-	-	222	-	-	-	-	-
Fe_2O_3	4-I	-	-	-	-	-	214	218	-	-	222	-	-	224	-	-
Fe_3O_4	4-I	212	212	-	-	-	-	220	-	-	-	-	-	-	-	-
Iron(ic) oxide coating on Haynes alloy no. 25 (L-605)	6-II	-	-	-	-	-	-	-	-	-	-	-	1381-1383	-	-	-
Iron(ic) oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	-	713	-	-	-	-	-
Iron(ic) oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	-	-	717	-	-	-	-	-
Iron(ic) oxide + Silicon (di-)oxide	4-I	-	-	-	-	-	-	719	-	-	-	-	-	-	-	-
Iron(ous) oxide + ΣX_i	4-I	-	-	-	-	-	-	-	-	-	721	-	-	-	-	-
Iron(ous, ic) oxide + Iron(ic) oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	715	-	-	-
Iron phosphites																
Fe_2P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Fe_3P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron selenides																
FeSe	6-I	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-
$FeSe_2$	6-I	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-
Fe_2Se_4	6-I	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-
Fe_7Se_8	6-I	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-
Iron (ortho-) silicate ($2\,FeO \cdot SiO_2$)	4-II	-	-	-	-	-	-	1243	-	-	1245	-	-	-	-	-
Iron silicides																
FeSi	6-I	-	409	-	-	-	411	-	-	-	413	-	-	-	-	-
$FeSi_2$	6-I	-	409	-	-	-	-	-	-	-	413	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Iron silicides (cont.)																
Fe_3Si	6-I	-	409	-	-	-	-	-	-	-	413	-	-	-	-	-
Fe_5Si_3	6-I	-	409	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron sulfides																
FeS	5	-	-	-	-	-	-	680	-	-	-	-	-	-	-	-
FeS_2	5	-	-	-	-	-	-	680	-	-	-	-	-	682	-	-
Iron tellurides																
FeTe	6-I	-	-	-	-	-	-	590	-	-	-	-	-	-	-	-
$FeTe_2$	6-I	-	-	-	-	-	-	590	-	-	592	-	-	-	-	-
Iron titanate ($FeO \cdot TiO_2$)	4-II	-	1425	1425	-	-	1427	1429	-	-	1431	-	-	-	-	-
Iron titanate coating on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1385	-	-	-
Iron-zirconium intermetallics																
Fe_2Zr	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Fe_3Zr	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Isobutylene and isoprene copolymer	6-II	-	-	-	-	-	-	-	-	1062	-	-	-	-	-	-
Isocyanate polyester elastomer	6-II	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isofoam	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-	-	-
K																
Kel-F	6-II	1030	-	-	-	-	-	-	1037	-	1045	-	-	-	-	-
Kennametals																
3047	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
3109	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
3406	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
3411	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
K1	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
K2S	6-II	-	-	-	-	-	-	-	889	-	885	-	-	-	-	-
K3H	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
K4H	6-II	-	-	-	-	-	-	-	-	-	885	-	-	-	-	-
K5H	6-II	-	-	-	-	-	-	-	-	-	885	-	-	-	-	-
K6	6-II	-	-	-	-	-	-	-	889	-	934	-	-	-	-	-
K7H	6-II	-	-	-	-	-	-	-	-	-	885	-	-	-	-	-
K8	6-II	-	-	-	-	-	-	-	-	-	897	-	-	-	-	-
K9	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
K10	2-I	-	-	-	-	-	-	-	-	-	565	-	-	-	-	-
K11	6-II	-	-	-	-	-	-	-	-	-	897	-	-	-	-	-
K21	6-II	-	-	-	-	-	-	-	-	-	883	-	-	-	-	-
K45	6-II	-	-	-	-	-	-	-	-	-	885	-	-	-	-	-
K68	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
K81	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Kennametals (cont.)																
K82	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
K84	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
K86	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
K90	6-II	-	-	-	-	-	-	-	-	-	903	-	-	-	-	-
K91	6-II	-	-	-	-	-	-	-	-	-	903	-	-	-	-	-
K92	6-II	-	-	-	-	-	-	-	-	-	903	-	-	-	-	-
K94	6-II	-	-	-	-	-	-	-	-	-	901	-	-	-	-	-
K95	6-II	-	-	-	-	-	-	-	-	-	899	-	-	-	-	-
K96	6-II	-	-	-	-	-	-	-	-	-	899	-	-	-	-	-
K138	6-II	136	-	-	-	-	-	-	-	-	864	-	-	-	-	-
K138A	6-II	136	-	-	-	-	-	-	-	-	864	-	-	-	-	-
K150A	6-II	-	-	-	-	-	-	-	-	-	875	-	-	-	-	-
K151	6-II	-	-	-	-	-	-	-	-	-	875	-	-	-	-	-
K151A	6-II	-	-	-	-	-	-	-	-	-	875	-	-	-	-	-
K151B	6-II	-	-	-	-	-	-	-	-	-	877	-	-	-	-	-
K152B	6-II	142	-	-	-	-	-	-	-	-	877	-	-	-	-	-
K161B	6-II	-	-	-	-	-	-	871	873	-	875	-	-	-	-	-
K162B	6-II	-	-	-	-	-	-	-	-	-	877	-	-	-	-	-
K601	6-II	-	-	-	-	-	-	-	-	-	860	-	-	-	-	-
K701	6-II	-	-	-	-	-	-	-	-	-	895	-	-	-	-	-
K801	6-II	-	-	-	-	-	-	-	-	-	907	-	-	-	-	-
KM	6-II	-	-	-	-	-	-	-	-	-	883	-	-	-	-	-
Kennametal K-151A coating on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1491	-	-	-
Kennametal K-162B coating on AISI 310	6-II	-	-	-	-	-	-	-	-	-	-	-	1493	-	-	-
Kennertium W-2	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
Kennertium W-10	6-II	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
Kimble N-51A glass	4-II	-	-	-	-	-	-	-	-	-	-	-	1707	1709	1713	-
Kyanite	4-II	-	-	-	-	-	-	1189	1191	-	1195	-		-	-	-
L																
Lamacoid 6045	6-II	-	-	-	-	-	-	-	-	1230	-	-	-	-	-	-
Lamicoid C-6030	6-II	1130	-	-	-	-	-	1144	-	-	-	-	-	-	-	-
Laminac 4129	6-II	-	-	-	-	-	-	-	-	-	968	-	-	-	-	-
Laminates																
Ceramic	6-II	-	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
Forsterite-stainless steel	6-II	-	-	-	-	-	-	-	1223	-	-	-	-	-	-	-
Graphite cloth	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
Reinforced epoxide	6-II	-	-	-	-	-	-	1117	1120	1220	1122-1124	-	-	-	-	-

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Laminates (cont.)																
Reinforced epoxy resin	6-II	-	-	-	-	-	-	1115-1117	1120	1220	1122-1124	-	-	-	-	-
Reinforced epoxy and plyophen copolymer resin	6-II	-	-	-	-	-	-	-	-	1218	-	-	-	-	-	-
Reinforced copolymer of phenolic and epoxide resins	6-II	-	-	-	-	-	-	-	-	-	1126	-	-	-	-	-
Reinforced melamine-formaldehyde resin	6-II	-	-	-	-	-	-	-	-	1128	-	-	-	-	-	-
Reinforced phenolic resin	6-II	1130	-	-	-	-	-	1132-1146	1148-1156	1159-1170, 1220	1172-1179	-	-	-	-	-
Reinforced phenyl silane resin	6-II	-	-	-	-	-	-	1212	-	1220	-	-	-	-	-	-
Reinforced polyester resin	6-II	1180	-	-	-	-	-	1191	1195-1198	1220	1200	-	-	-	-	-
Reinforced TAC polyester resin	6-II	1180	-	-	-	-	-	1183	1185	1220	1187-1189	-	-	-	-	-
Reinforced polytetrafluoro-ethylene	6-II	-	-	-	-	-	-	1214	1218	1220	-	-	-	-	-	-
Reinforced silicone resin	6-II	1204	-	-	-	-	-	1206	1208, 1218	1220	1200	-	-	-	-	-
Reinforced teflon	6-II	-	-	-	-	-	-	1214	1218	1220	-	-	-	-	-	-
Lampblacks																
Lampblack	1	-	-	-	-	-	-	-	97	-	-	-	99-101	103	-	-
CEP National	1	-	-	-	-	-	-	-	-	-	-	-	-	103	-	-
L 113SP	1	-	-	-	-	-	-	-	-	-	-	-	101	103	-	-
RW Spektral II	1	-	-	-	-	-	-	-	-	-	-	-	-	103	-	-
Lanthana	4-I	226	226	-	-	-	-	228	-	-	230	-	-	-	-	232
Lanthanum (La)	1	606	606	606	606	606	608	610	-	-	612	-	-	-	-	614
Lanthanum + Calcium	2-I	-	250	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum + Magnesium	2-I	252	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum + Magnesium + ΣX_i	2-II	1022	1022	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum aluminides																
LaAl	6-I	43	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAl_2$	6-I	43	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAl_4$	6-I	43	43	-	-	-	-	-	-	-	-	-	-	-	-	-
La_3Al_2	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum antimonide																
La_2Sb	6-I	-	81	-	-	-	-	-	-	-	-	-	-	-	-	-
La_3Sb_2	6-I	-	81	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum arsenide (LaAs)	6-I	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-bismuth intermetallics (LaBi)	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Lanthanum borides																
LaB_4	6-I	295	296	-	-	-	-	-	-	-	-	-	-	-	-	-
LaB_6	6-I	295	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Lanthanum bromide ($LaBr_3$)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-cadmium intermetallics																
LaCd	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCd_2$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCd_{11}$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum carbides																
LaC_2	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum chloride ($LaCl_3$)	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-copper intermetallics																
LaCu	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCu_2$	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCu_4$	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCu_5$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaCu_6$	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum fluoride (LaF_3)	5	-	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-gallium intermetallics ($LaGa_2$)	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum germanides ($LaGe_2$)	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-gold intermetallics																
LaAu	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAu_2$	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAu_3$	6-I	667	668	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Au	6-I	667	668	-	-	-	-	-	-	-	-	-	-	-	-	-
La_3Au	6-I	668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum hydride (LaH_2)	5	427	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-indium intermetallics ($LaIn_3$)	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-lead intermetallics																
LaPb	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaPb_3$	6-I	667	668	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Pb	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-magnesium intermetallics																
LaMg	6-I	667	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaMg_3$	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaMg_9$	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-
La_4Mg	6-I	-	668	-	-	-	-	-	-	-	-	-	-	-	-	-

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Lanthanum-mercury intermetallics																
LaHg	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaHg_2$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaHg_3$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-nickel intermetallics ($LaNi_5$)	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum nitride (LaN)	5	621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-osmium intermetallics ($LaOs_2$)	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum oxides																
LaO	4-I	226	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2O_3	4-I	226	226	-	-	-	-	228	-	-	230	-	-	-	-	232
Lanthanum phosphide (LaP)	5	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum selenides																
LaSe	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Se_3	6-I	365	-	-	-	-	367	-	-	-	-	-	-	-	-	-
La_3Se_4	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum silicides ($LaSi_2$)	6-I	415	415	-	-	-	527	-	-	-	417	-	-	-	-	-
Lanthanum-silver intermetallics																
LaAg	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAg_2$	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaAg_3$	6-I	667-668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum stannides																
$LaSn_3$	6-I	541	541	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Sn	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Sn_3	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum sulfides																
LaS	5	684	684	-	-	-	-	-	-	-	686	-	-	-	-	-
LaS_2	5	684	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2S_3	5	684	684	-	-	-	-	-	-	-	686	-	-	-	-	-
La_3S_4	5	684	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum telluride (La_2Te_3)	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Lanthanum-thallium intermetallics																
LaTl	6-I	-	669	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaTl_3$	6-I	667	669	-	-	-	-	-	-	-	-	-	-	-	-	-
La_2Tl	6-I	-	669	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum-zinc intermetallics																
LaZn	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$LaZn_5$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Lanthanum-zinc intermetallics (cont.)																
$LaZn_{11}$	6-I	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lawsonite	4-II	-	-	-	-	-	-	1233	-	-	-	-	-	-	-	-
Lead + Copper	2-I	254	-	-	-	-	-	-	-	-	256	-	-	-	-	-
Lead aluminate ($PbO \cdot Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1003	-	-	-	-	-
Lead borate glass	4-II	-	-	-	-	-	-	-	-	-	1615	-	-	-	-	-
Lead borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1717	-	-	-	-	-
Lead-barium magnesium aluminum silicate	4-II	-	-	-	-	-	-	-	-	-	1256-1258	-	-	-	-	-
Lead boron silicate ($5\ PbO \cdot B_2O_3 \cdot SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1250	-	-	-	-	-
Lead germanium oxide ($2\ PbO \cdot GeO_2$)	4-II	-	-	-	-	-	-	-	-	-	1133	-	-	-	-	-
Lead germanium phosphate ($5\ PbO \cdot GeO_2 \cdot P_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1175	-	-	-	-	-
Lead magnesium aluminum silicate	4-II	-	-	-	-	-	-	-	-	-	1252-1254	-	-	-	-	-
Lead molybdate ($PbO_2 \cdot MoO_2$)	4-II	-	-	-	-	-	-	1113	-	-	1115	-	-	-	-	-
Lead (mon-)oxide (PbO)	4-I	-	-	-	-	-	-	234	-	-	-	-	-	-	-	-
Lead phosphates																
$PbO \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
$2\ PbO \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
$3\ PbO \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
$3\ PbO \cdot 2\ P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
$5\ PbO \cdot 2\ P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
$8\ PbO \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
Lead potassium silicate glass	4-II	-	-	-	-	-	-	-	-	1749	-	-	-	-	-	-
Lead silicates																
$PbO \cdot SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1247	-	-	-	-	-
$2\ PbO \cdot SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1247	-	-	-	-	-
$4\ PbO \cdot SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1247	-	-	-	-	-
Lead silicate glass	4-II	-	-	-	-	-	1739	-	1741	-	-	-	1743	1745	1747	-
Lead silicon phosphate ($5\ PbO \cdot SiO_2 \cdot P_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1177	-	-	-	-	-
Lead strontium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1751	-	-	-	-	-
Lead sulfide (PbS)	5	-	-	-	-	-	-	-	-	-	-	-	-	688	-	-
Lead telluride (PbTe)	6-I	-	-	-	-	-	594	-	596	-	-	-	-	-	-	-
Lead telluride + Tin telluride	6-I	-	-	-	-	-	717	-	-	-	-	-	-	-	-	-
Lead (meta-) titanate ($PbO \cdot TiO_2$)	4-II	-	-	-	-	-	-	-	1433	-	1435	-	-	-	-	-
Lead tungstate ($PbO \cdot WO_3$)	4-II	-	-	-	-	-	-	1474	-	-	1476	-	-	-	-	-
Lead zirconate ($PbO \cdot ZrO_2$)	4-II	-	-	-	-	-	-	-	1510	-	-	-	-	-	-	-
Leonhardite	4-II	-	-	-	-	-	-	1233	-	-	-	-	-	-	-	-

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Libbey-Owens-Ford plate glass no. 9330	4-II	-	-	-	-	-	-	1791	-	-	-	-	-	-	-	-
Lime	4-I	99	99	-	-	-	101	103	105	-	107	-	-	-	-	109
Lime window glass	4-II	-	-	-	-	-	-	-	1831	-	-	-	-	-	-	-
Lithium + Sodium	2-I	-	-	-	-	-	-	-	-	258	-	-	-	-	-	-
Lithium aluminates																
$Li_2O \cdot Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	1005	-	-	-	-	-
$Li_2O \cdot 5 Al_2O_3$	4-II	-	-	-	-	-	-	-	-	-	1005	-	-	-	-	-
Lithium aluminum borate glass	4-II	-	-	-	-	-	-	-	-	-	1617	-	-	-	-	-
Lithium aluminum fluoride (Li_3AlF_6)	5	-	-	-	-	-	-	377	-	-	-	-	-	-	-	-
Lithium aluminum silicate																
$Li_2O \cdot Al_2O_3 \cdot 3\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1275	-	-	-	-	-
$Li_2O \cdot Al_2O_3 \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1268-1270	-	-	-	-	-
$Li_2O \cdot 1.08\ Al_2O_3 \cdot 3.5\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1268	-	-	-	-	-
$Li_2O \cdot Al_2O_3 \cdot 4\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1268-1270	-	-	-	-	-
$Li_2O \cdot Al_2O_3 \cdot 6\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1268-1270	-	-	-	-	-
$Li_2O \cdot Al_2O_3 \cdot 8\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1268, 1275	-	-	-	-	-
$Li_2O \cdot Al_2O_3 \cdot 10\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1275	-	-	-	-	-
Lithium aluminum silicate + + Lead bisilicate	4-II	-	-	-	-	-	-	-	-	-	1566	-	-	-	-	-
Lithium aluminum silicate + + Lead borate	4-II	-	-	-	-	-	-	-	-	-	1560	-	-	-	-	-
Lithium aluminum silicate + + Lithium aluminum germanium oxide	4-II	-	-	-	-	-	-	-	-	-	1568	-	-	-	-	-
Lithium aluminum silicate bodies, barium modified	4-II	-	-	-	-	-	-	-	-	-	1277-1281	-	-	-	-	-
Lithium aluminum silicate glass.	4-II	-	-	-	-	-	-	-	-	-	1757-1759	-	-	-	-	-
Lithium beryllium borate glass	4-II	-	-	-	-	-	-	-	-	-	1619	-	-	-	-	-
Lithium beryllium fluoride (Li_2BeF_4)	5	-	-	-	-	-	-	379	-	-	-	-	-	-	-	-
Lithium (meta-)borate ($Li_2O \cdot B_2O_3$)	4-II	-	-	-	-	1041	-	-	-	-	-	-	-	-	-	1043
Lithium borate glass	4-II	-	-	-	-	-	1607	-	-	-	-	-	-	-	-	-
Lithium borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1719	-	-	-	-	-
Lithium calcium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1761	-	-	-	-	-
Lithium carbide (Li_4C_2)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium chloride (LiCl and Li_2Cl_2)	5	317	317	-	317	317	-	-	-	-	-	-	-	-	-	319
Lithium cobalt oxide ($Li_xCo_{1-x}O$)	4-II	-	-	-	-	-	1135	-	-	-	-	-	-	-	-	-

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Lithium cobalt nickel oxide $[Li_x(Co_yNi_{1-y})_{1-x}O]$	4-II	-	-	-	-	-	1137	-	1139	-	-	-	-	-	-	-
Lithium copper oxide ($Li_xCu_{1-x}O$)	4-II	-	-	-	-	-	1141	-	1143	-	-	-	-	-	-	-
Lithium fluoride (LiF and Li_2F_2)	5	369	369	369	369	369	-	-	371	-	-	-	-	373	-	375
Lithium fluoride + Potassium fluoride	5	-	-	-	-	-	-	409	-	-	-	-	-	-	-	-
Lithium germanium oxides																
$Li_2O \cdot GeO_2$	4-II	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
$Li_2O \cdot 7\ GeO_2$	4-II	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
$2\ Li_2O \cdot GeO_2$	4-II	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
$3\ Li_2O \cdot 2\ GeO_2$	4-II	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
$3\ Li_2O \cdot 8\ GeO_2$	4-II	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
Lithium hydride (LiH)	5	431	431	431	431	-	-	433	435	-	437	-	-	-	-	-
Lithium lead silicate glass	4-II	-	-	-	-	-	1763		-	-	-	-	-	-	-	-
Lithium-magnesium-barium silicate glass	4-II	-	-	-	-	-	1765		-	-	-	-	-	-	-	-
Lithium magnesium borate glass	4-II	-	-	-	-	-	-	-	-		1621	-	-	-	-	-
Lithium manganese oxide ($Li_xMn_{1-x}O$)	4-II	-	-	-	-	-	1147	-	-	-	-	-	-	-	-	-
Lithium manganese selenide ($Li_xMn_{1-x}Se$)	6-I	-	-	-	-	-	337	-	339	-	-	-	-	-	-	-
Lithium nickel oxide ($Li_xNi_{1-x}O$)	6-II	-	-	-	-	-	1149	-	1151	-	-	-	-	-	-	-
Lithium nitride (Li_3N)	5	621	-	621	621	-	-	-	-	-	-	-	-	-	-	-
Lithium oxide (Li_2O)	4-I	236	236	236	236	236	-	238	-	-	-	-	-	-	-	240
Lithium potassium aluminum silicate	4-II	-	-	-	-	-	-	-	-	-	1283	-	-	-	-	-
Lithium silicates																
$Li_2O \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1260	-	-	-	-	-
$2\ Li_2O \cdot SiO_2$	4-II	-	-	-	-	-	-	-	-	-	1260	-	-	-	-	-
Lithium silicate glass	4-II	-	-	-	-	-	1753	-	-	-	1755	-	-	-	-	-
Lithium silicate - quartz body	4-II	-	-	-	-	-	-	-	-	-	1262-1264	-	-	-	-	-
Lithium sodium silicate glass	4-II	-	-	-	-	-	1767	-	-	-	-	-	-	-	-	-
Lithium titanate ($Li_2O \cdot TiO_2$)	4-II	-	-	-	-	-	-	1437	-	-	-	-	-	-	-	-
Lithium uranate ($Li_2O \cdot UO_3$)	4-II	-	1482	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium zinc ferrite ($Li_xZn_{0.8}Fe_{2.1-x}O_4$)	4-II	-	-	-	-	-	-	1101	-	-	-	-	-	-	-	-
Lockfoam	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-	-	-
Lohm	2-I	-	-	-	-	-	-	-	138	-	-	-	-	-	-	-
LT-1 Metamic cermet	6-II	731	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LT-1B Haynes cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	735	-	-	-
LT-2 Haynes cermet	6-II	-	-	-	-	-	-	-	-	-	739	-	747	-	-	-
Lucalox	4-I	-	-	-	-	-	-	-	-	-	743	-	745	-	-	-
Lucite	6-II	1020	-	-	-	-	-	-	11	-	22	-	32	-	-	-
									1024	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Lustrex L-2020	6-II	-	1076	-	-	-	-	-	-	-	-	-	-	-	-	-
Lutecium (Lu)	1	616	616	616	616	616	618	620	-	-	-	-	-	-	-	-
Lutecium borides																
LuB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LuB_6	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lutecium carbide (LuC_2)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lutecium-osmium intermetallics ($LuOs_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lutecium oxide (Lu_2O_3)	4-I	-	-	-	-	-	-	242	-	-	244	-	246	-	-	-
M																
Magnesia-alumina spinel	4-II	-	-	-	-	-	-	-	-	1015	-	-	-	-	-	-
Magnesium (Mg)	1	622	622	622	-	622	624	626	628	630	632	-	634	636-638	-	640
Magnesium + ΣX_i	2-II	-	-	-	-	-	1071-1075	1077	1079	-	1081	-	-	-	-	-
Magnesium + Aluminum + ΣX_i	2-II	1024	1024	1024	-	-	1026	1029	1031	1033	1035	-	-	1038-1042	-	-
Magnesium + Cerium	2-I	-	-	-	-	-	-	-	260	-	-	-	-	-	-	-
Magnesium + Cerium + ΣX_i	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
Magnesium + Thorium	2-I	264	262	262	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium + Thorium + ΣX_i	2-II	-	1047	1047	-	-	1049-1053	1055	1057	-	1059	-	-	1061	-	-
Magnesium + Zinc	2-I	-	266	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium + Zinc + ΣX_i	2-II	-	1063	1063	-	-	-	1065	1067	-	1069	-	-	-	-	-
Magnesium L120 (British aircraft material spec.)	1	-	-	-	-	-	-	-	-	-	-	-	-	636	-	-
Magnesium alloys (special designation)																
1959	2-I	-	-	-	-	-	-	-	260	-	-	-	-	-	-	-
1960	2-I	-	-	-	-	-	-	-	260	-	-	-	-	-	-	-
1961	2-I	-	-	-	-	-	-	-	260	-	-	-	-	-	-	-
1964	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
1992	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
AM-100A	2-II	-	-	-	-	-	1026	-	-	-	-	-	-	-	-	-
AN-M-29	2-II	1024	-	-	-	-	-	1029	1031	1033	1035	-	-	-	-	-
AX-81-X1	2-II	-	-	-	-	-	-	-	-	-	1035	-	-	-	-	-
AZ-31	2-II	-	-	-	-	-	-	-	-	-	-	-	-	1038	-	-
AZ-31A	2-II	-	1024	1024	-	-	1026	-	-	-	1035	-	-	1040	-	-
AZ-31B	2-II	-	1024	1024	-	-	1026	1029	-	-	1035	-	-	1040-1042	-	-
AZ-63A	2-II	-	-	-	-	-	1026	-	-	-	1035	-	-	-	-	-
AZ-80	2-II	-	-	-	-	-	-	1029	-	-	-	-	-	-	-	-
AZ-81	2-II	-	-	-	-	-	-	-	-	-	1035	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Magnesium alloys (special designation) (cont.)																
AZ-91C	2-II	-	-	-	-	-	1026	-	-	-	-	-	-	-	-	-
AZ-92A	2-II	-	-	-	-	-	1026	-	-	-	1035	-	-	-	-	-
DTD 350	2-II	-	-	-	-	-	-	-	1079	-	-	-	-	-	-	-
DTD 360	2-II	-	-	-	-	-	-	-	1079	-	-	-	-	-	-	-
EK-30	2-II	-	-	-	-	-	-	-	-	-	1081	-	-	-	-	-
EK-30A	2-II	-	-	-	-	-	1071	-	-	-	-	-	-	-	-	-
EK-32A	2-II	-	-	-	-	-	-	-	-	-	1081	-	-	-	-	-
EK-33A	2-II	-	-	-	-	-	-	-	-	-	1081	-	-	-	-	-
EK-41	2-II	-	-	-	-	-	-	-	-	-	1081	-	-	-	-	-
EK-41A	2-II	-	-	-	-	-	1073	-	-	-	-	-	-	-	-	-
EZ-33A	2-II	-	-	-	-	-	1075	-	-	-	1081	-	-	-	-	-
H-807	2-II	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
H-809	2-II	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
H-811	2-II	-	-	-	-	-	-	-	1045, 1067	-	-	-	-	-	-	-
H-812	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
H-817	2-II	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
HK-31	2-II	-	-	-	-	-	-	-	-	-	1059	-	-	-	-	-
HK-31A	2-II	-	1047	1047	-	-	1049	1055	-	-	-	-	-	1061	-	-
HK-31XA	2-II	-	-	-	-	-	1049	-	-	-	1059	-	-	-	-	-
HM-21XA	2-II	-	1047	1047	-	-	1051	1055	-	-	-	-	-	-	-	-
HM-31XA	2-I	-	262	262	-	-	-	-	-	-	-	-	-	-	-	-
	2-II	-	-	-	-	-	-	1077	-	-	-	-	-	-	-	-
Hydronalium 71	2-II	-	-	-	-	-	1026	-	1031	-	-	-	-	-	-	-
HZ-32A	2-II	-	-	-	-	-	1053	-	-	-	-	-	-	-	-	-
HZ-32XA	2-II	-	-	-	-	-	1053	-	-	-	1059	-	-	-	-	-
Magnox B	2-II	-	-	-	-	-	-	-	1079	-	-	-	-	-	-	-
MSR	2-II	-	-	-	-	-	-	-	1079	-	-	-	-	-	-	-
RZ5	2-II	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
TZ6	2-II	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
Z3Z	2-II	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
ZK-60	2-II	-	1063	1063	-	-	-	-	-	-	-	-	-	-	-	-
ZK-60A	2-II	-	-	-	-	-	-	1065	-	-	1069	-	-	-	-	-
ZREO	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
ZT1	2-II	-	-	-	-	-	-	-	1057	-	-	-	-	-	-	-
ZTY	2-II	-	-	-	-	-	-	-	1057	-	-	-	-	-	-	-
Magnesium aluminate ($MgO \cdot Al_2O_3$)	4-II	1007	1007	-	-	-	1009	1011	1013	1015	1017	-	-	-	-	-
Magnesium aluminate + + Magnesium oxide	4-II	-	-	-	-	-	-	-	1520	-	1522	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Magnesium aluminate + Silicon (di-) oxide	4-II	-	-	-	-	-	-	-	1532	-	-	-	-	-	-	-
Magnesium aluminate + Sodium (mon-) oxide	4-II	-	-	-	-	-	-	1524	1526	1528	1530	-	-	-	-	-
Magnesium aluminate spinal	4-II	1007	1007	-	-	-	1009	1011	1013	1015	1017	-	-	-	-	-
Magnesium aluminate spinel with sodium (mon-) oxide	4-II	-	-	-	-	-	-	1524	1526	1528	1530	-	-	-	-	-
Magnesium aluminum borate glass	4-II	-	-	-	-	-	-	-	-	-	1623	-	-	-	-	-
Magnesium aluminum silicate ($2\ MgO \cdot 2\ Al_2O_3 \cdot 5\ SiO_2$)	4-II	-	-	-	-	-	1298	1300	1302	-	1304-1308	-	-	-	-	-
Magnesium aluminum silicate bodies	4-II	-	-	-	-	-	-	-	-	-	1310	-	-	-	-	-
Magnesium aluminum silicate glass	4-II	-	-	-	-	-	-	-	-	-	1769	-	-	-	-	-
Magnesium antimonide (Mg_3Sb_2)	6-I	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-
Magnesium barium cerium titanate [$(Ba_{1-x-y}Mg_xCe_y)O \cdot TiO_2$]	4-II	-	-	-	-	-	1447	-	-	-	-	-	-	-	-	-
Magnesium barium titanate	4-II	-	-	-	-	-	-	-	-	-	1445	-	-	-	-	-
Magnesium beryllium borate glass	4-II	-	-	-	-	-	-	-	-	-	1625	-	-	-	-	-
Magnesium borides																
MgB_2	6-I	-	-	-	-	-	-	182	-	-	-	-	-	-	-	184
MgB_4	6-I	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-
Magnesium-cadmium intermetallics																
MgCd	6-I	-	-	-	-	-	-	644	-	-	-	-	-	-	-	-
$MgCd_3$	6-I	-	-	-	-	-	-	644	-	-	-	-	-	-	-	-
Mg_3Cd	6-I	-	-	-	-	-	-	644	-	-	-	-	-	-	-	-
Magnesium carbonate ($MgCO_3$)	4-II	-	-	-	-	-	-	-	-	-	-	-	-	1047	-	-
Magnesium chloride ($MgCl_2$)	5	-	321	-	-	323	-	-	-	-	-	-	-	-	-	325
Magnesium chromites																
$MgO \cdot Cr_2O_3$	4-II	-	-	-	-	-	1055	1057	-	-	1059	-	-	-	-	-
$MgO \cdot 4\ Cr_2O_3$	4-II	-	-	-	-	-	1055	-	-	-	-	-	-	-	-	-
$4\ MgO \cdot Cr_2O_3$	4-II	-	-	-	-	-	1055	-	-	-	-	-	-	-	-	-
Magnesium chromite spinal	4-II	-	-	-	-	-	-	-	-	-	1059	-	-	-	-	-
Magnesium ferrites																
$MgO \cdot Fe_2O_3$	4-II	-	-	-	-	-	1079	1081	-	-	1083	-	-	-	-	-
$MgO \cdot 2\ FeO$	4-II	-	-	-	-	-	-	-	-	-	1083	-	-	-	-	-
Magnesium fluoride (MgF_2)	5	-	381	-	-	383	-	-	-	-	385	-	-	-	-	387
Magnesium fluoride coating on quartz	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1425	1427	-
Magnesium germanide (Mg_2Ge)	6-I	309	309	-	-	-	311	-	-	-	-	-	-	-	-	-
Magnesium hydride (MgH_2)	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Magnesium-lead intermetallics (Mg_2Pb)	6-I	-	-	-	-	-	650	-	-	-	-	-	-	-	-	-
Magnesium lead silicate glass	4-II	-	-	-	-	-	1771	-	-	-	-	-	-	-	-	-
Magnesium molybdate ($MgO \cdot MoO_3$)	4-II	-	-	-	-	-	-	1117	-	-	-	-	-	-	-	-
Magnesium niobates																
$MgO \cdot Nb_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
$2\ MgO \cdot Nb_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
$3\ MgO \cdot Nb_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
$4\ MgO \cdot Nb_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
Magnesium nitride (Mg_3N_2)	5	-	-	-	-	-	-	633	-	-	-	-	-	-	-	-
Magnesium oxides																
Magnesium oxide (MgO)	4-I	248	248	-	-	-	250	252	254	257	259	263	265-267	269	-	271
M-300	4-I	-	-	-	-	-	-	-	-	-	259	-	-	-	-	-
PC-235	4-I	-	-	-	-	-	-	-	-	257	-	-	-	-	-	-
SR-2808	4-I	-	-	-	-	-	-	-	-	257	-	-	-	-	-	-
Magnesium oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	723	-	-	-	-	-	-
Magnesium oxide + Aluminum oxide + Beryllium oxide	4-I	-	-	-	-	-	-	-	-	-	725	-	-	-	-	-
Magnesium oxide + Aluminum oxide + Iron(ic) oxide + + Silicon (di-)oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	727	-	-	-	-	-	-	-
Magnesium oxide + Beryllium oxide	4-I	-	-	-	-	-	-	-	729	-	731	-	-	-	-	-
Magnesium oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	-	733	735	-	-	-	-	-
Magnesium oxide + Calcium oxide + Iron(ic) oxide	4-I	-	-	-	-	-	-	-	-	737	-	-	-	-	-	-
Magnesium oxide + Chromium (sesqui-)oxide + Aluminum oxide + Iron(ic) oxide + + Silicon (di-)oxide	4-I	-	-	-	-	-	-	-	739	-	-	-	-	-	-	-
Magnesium oxide + Chromium (sesqui-)oxide + Iron(ic) oxide + Aluminum oxide + + Silicon (di-)oxide + + Iron(ous) oxide	4-I	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
Magnesium oxide + Iron(ic) oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	743	-	-	-	-	-	-	-
Magnesium oxide + Magnesium aluminate	4-II	-	-	-	-	-	-	-	1536	-	-	-	-	-	-	-
Magnesium oxide + Magnesium silicate	4-II	-	-	-	-	-	-	-	1538	-	-	-	-	-	-	-
Magnesium oxide + Nickel (mon-)oxide	4-I	-	-	-	-	-	745	-	747	-	-	-	-	-	-	-
Magnesium oxide + Silicon (di-)oxide	4-I	-	-	-	-	-	-	-	749	-	751	-	-	-	-	-

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Magnesium oxide + Talc	4-II	-	-	-	-	-	-	-	1538	-	-	-	-	-	-	-
Magnesium oxide + Tin(ic) oxide	4-I	-	-	-	-	-	-	-	753	-	-	-	-	-	-	-
Magnesium oxide + Titanium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	755	-	-	-	-	-
Magnesium oxide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	788	-	-	-	-	-
Magnesium oxide + Uranium (di-)oxide	4-I	-	-	-	-	-	-	-	757	-	-	-	-	-	-	-
Magnesium oxide + Yttrium oxide	4-I	-	-	-	-	-	-	-	-	-	759	-	-	-	-	-
Magnesium oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	761	-	-	-	-	-	-	-
Magnesium silicates																
$MgO \cdot SiO_2$	4-II	1285	1285	-	-	-	1287	1289	1293	-	1295	-	-	-	-	-
$2\ MgO \cdot SiO_2$	4-II	-	-	-	-	-	-	1289	1291	-	1295	-	-	-	-	-
$3\ MgO \cdot 4\ SiO_2 \cdot H_2O$	4-II	-	-	-	-	-	-	1289	-	-	-	-	-	-	-	-
Magnesium (ortho-)silicate + + Zinc (ortho-)silicate	4-II	-	-	-	-	-	-	-	-	-	1571	-	-	-	-	-
Magnesium silicides (Mg_2Si)	6-I	-	419	-	-	-	421	-	-	-	-	-	-	-	-	-
Magnesium silicide stannide ($Mg_2Si_xSn_{1-x}$)	6-I	-	-	-	-	-	537	-	539	-	-	-	-	-	-	-
Magnesium stannate ($MgO \cdot SnO_2$)	4-II	-	-	-	-	-	-	-	1361	-	-	-	-	-	-	-
Magnesium stannide (Mg_2Sn)	6-I	533	533	-	-	-	535	-	-	-	-	-	-	-	-	-
Magnesium titanates																
$MgO \cdot TiO_2$	4-II	-	-	-	-	-	1439	1441	-	-	1443	-	-	-	-	-
$MgO \cdot 2\ TiO_2$	4-II	-	-	-	-	-	1439	1441	-	-	1443	-	-	-	-	-
$MgO \cdot 5\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1443	-	-	-	-	-
$2\ MgO \cdot TiO_2$	4-II	-	-	-	-	-	1439	1441	-	-	1443	-	-	-	-	-
$2\ MgO \cdot 3\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1443	-	-	-	-	-
Magnesium titanate porcelain	5	1003	-	-	-	-	-	-	1017	-	-	-	-	-	-	-
Magnesium tungstate ($MgO \cdot WO_3$)	4-II	-	-	-	-	-	-	1478	-	-	-	-	-	-	-	-
Magnesium tungsten lead oxide ($2\ PbO \cdot MgO \cdot WO_3$)	4-II	-	-	-	-	-	-	-	-	-	1153	-	-	-	-	-
Magnesium vanadates																
$MgO \cdot V_2O_5$	4-II	-	-	-	-	-	-	1492	-	-	-	-	-	-	-	-
$2\ MgO \cdot V_2O_5$	4-II	-	-	-	-	-	-	1492	-	-	-	-	-	-	-	-
Magnesium uranate ($MgO \cdot UO_3$)	4-II	-	1482	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium zirconate ($MgO \cdot ZrO_2$)	4-II	-	-	-	-	-	-	-	-	-	1512	-	-	-	-	-
Magnetite	4-I	212	212	-	-	-	-	220	-	-	-	-	-	-	-	-
Manganese (Mn)	1	642	642	-	-	642	644	646	-	-	648	-	-	650	-	652
Manganese, electrolytic	1	-	-	-	-	-	-	646	-	-	648	-	-	-	-	-
Manganese + Aluminum	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
Manganese + Copper	2-I	-	-	-	-	-	271	273	-	-	275-277	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Manganese + Copper + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1083-1089	-	-	-	-	-
Manganese + Nickel	2-I	-	-	-	-	-	279	-	-	-	281	-	-	-	-	-
Manganese + Nickel + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1091-1097	-	-	-	-	-
Manganese + Titanium	2-I	283, 519	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese alloys (special designations)																
A-47	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-48	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-49	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-49.5	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-50	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-51	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-52	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-53	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-54	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-55	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-56	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-57	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-58	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-59	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
A-60	2-I	-	-	-	-	-	-	268	-	-	-	-	-	-	-	-
Manganese aluminate ($MnO \cdot Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1019	-	-	-	-	-
Manganese aluminum carbide (Mn_3AlC)	5	-	-	-	-	-	-	73	-	-	-	-	-	-	-	-
Manganese antimonide (MnSb)	6-I	-	-	-	-	-	69	-	-	-	-	-	-	-	-	-
Manganese arsenide (Mn_7As)	6-I	-	94	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese arsenide telluride ($MnTe_{1-X}As_X$)	6-I	-	-	-	-	-	600	-	602	-	-	-	-	-	-	-
Manganese carbide (Mn_3C)	5	67	67	-	-	-	-	69	-	-	-	-	-	-	-	71
Manganese chromite ($MnO \cdot Cr_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1061	-	-	-	-	-
Manganese ferrite ($MnO \cdot Fe_2O_3$)	4-II	1085	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese nickel	2-II	-	-	-	-	-	-	-	-	-	1273	-	-	-	-	-
Manganese nitride (Mn_4N)	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese oxides																
MnO	4-I	-	-	-	-	-	-	273	-	-	281	-	-	-	-	-
MnO_2	4-I	-	-	-	-	-	-	275	-	-	281	-	-	-	-	-
Mn_2O_3	4-I	-	-	-	-	-	-	277	-	-	-	-	-	-	-	-
Mn_3O_4	4-I	-	-	-	-	-	-	-	279	-	-	-	-	-	-	-
Manganese (sesqui-) oxide + + Magnesium oxide	4-I	-	-	-	-	-	-	-	763	-	-	-	-	-	-	-

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Manganese-palladium intermetallics (MnPd)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese phosphides																
MnP	5	635	635	-	-	-	639	-	-	-	-	-	-	-	-	-
Mn_2P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Mn_3P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Mn_3P_2	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese selenide (MnSe)	6-I	-	-	-	-	-	-	341	-	-	-	-	-	-	-	-
Manganese silicate ($MnO \cdot SiO_2$)	4-II	-	-	-	-	-	-	1312	-	-	1314	-	-	-	-	-
Manganese silicides																
$MnSi_{0.3-0.5}$	6-I	-	-	-	-	-	-	427	-	-	-	-	-	-	-	-
MnSi	6-I	-	423	-	-	-	425	427	-	-	431	-	-	-	-	-
$MnSi_2$	6-I	-	-	-	-	-	425	427	429	-	-	-	-	-	-	-
Mn_3Si	6-I	-	423	-	-	-	-	-	-	-	-	-	-	-	-	-
Mn_5Si_3	6-I	-	423	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese telluride (MnTe)	6-I	-	-	-	-	-	-	598	-	-	-	-	-	-	-	-
Manganese zinc carbide (Mn_3ZnC)	5	-	-	-	-	-	-	75	-	-	-	-	-	-	-	-
Manganin	2-II	-	-	-	-	-	978	-	-	-	-	-	-	-	-	-
Marlex 20	6-II	-	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Marlex 50	6-II	-	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Massicot	4-I	-	-	-	-	-	-	234	-	-	-	-	-	-	-	-
Matte silver	1	-	-	-	-	-	-	-	-	-	-	910	-	-	-	-
Melamine formaldehyde	6-II	-	1014	-	-	-	-	-	-	-	-	-	-	-	-	-
Melamine formaldehyde, reinforced	6-II	-	-	-	-	-	-	-	-	-	1101	-	-	-	-	-
Melamine formaldehyde, alpha cellulose filled	6-II	-	-	-	-	-	-	-	-	-	1018	-	-	-	-	-
Melamine formaldehyde, mineral filled	6-II	-	-	-	-	-	1016	-	-	-	-	-	-	-	-	-
Melamine-formaldehyde resin, reinforced	6-II	-	-	-	-	-	-	-	-	1128	-	-	-	-	-	-
Melmac 592	6-II	-	-	-	-	-	1016	-	-	-	-	-	-	-	-	-
Melmac 1077	6-II	-	-	-	-	-	-	-	-	-	1018	-	-	-	-	-
Melmac 1079	6-II	-	-	-	-	-	-	-	-	-	1018	-	-	-	-	-
Melmac 1502	6-II	-	-	-	-	-	-	-	-	-	1018	-	-	-	-	-
Merwinite	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
Mercuric selenide (HgSe)	6-I	-	-	-	-	-	-	343	-	-	-	-	-	-	-	-
Metal cermets	6-II	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metco XP-1103	6-II	-	-	-	-	-	-	-	-	-	-	1309	1311	-	-	-
Metco XP-1106	6-II	-	-	-	-	-	-	-	-	-	-	1325	1327	-	-	-
Metco XP-1109	6-II	-	-	-	-	-	-	-	-	-	-	1407	1409	-	-	-
Metco XP-1110	6-II	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-

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Mica																
Mica	5	983	-	-	-	-	985-987	-	989-991	-	993-1001	-	-	-	-	-
Biotite	5	-	-	-	-	-	-	-	-	-	997	-	-	-	-	-
Cericite	5	-	-	-	-	-	-	-	-	-	993	-	-	-	-	-
Glass bonded	5	-	-	-	-	-	987	-	-	-	-	-	-	-	-	-
Illite	5	-	-	-	-	-	-	-	-	-	993	-	-	-	-	-
Iron	5	-	-	-	-	-	-	-	-	-	997	-	-	-	-	-
Magnesium	5	-	-	-	-	-	-	-	-	-	999	-	-	-	-	-
Muscovite	5	-	-	-	-	-	985	-	-	-	1001	-	-	-	-	-
Phlogophite	5	-	-	-	-	-	-	-	-	-	999	-	-	-	-	-
Ripidolite	5	-	-	-	-	-	-	-	-	-	995	-	-	-	-	-
Synthetic	5	-	-	-	-	-	985	-	991	-	-	-	-	-	-	-
Synthetic, barium	5	-	-	-	-	-	985	-	-	-	-	-	-	-	-	-
Zinn waldite	5	-	-	-	-	-	-	-	-	-	995	-	-	-	-	-
Micro-Quartz type II	6-II	-	-	-	-	-	-	1216	-	-	-	-	-	-	-	-
MIL-C-7350 type I and II	6-II	-	-	-	-	-	-	-	-	1275	-	-	-	-	-	-
MIL-C-8021 type I	6-II	-	-	-	-	-	-	-	-	1275	-	-	-	-	-	-
MIL-C-8087	6-II	-	-	-	-	-	-	954	956	-	958	-	-	-	-	-
Mineral aluminum silicates	4-II	-	-	-	-	-	1187	-	-	-	-	-	-	-	-	-
Mo-9-8 molybdenum	1	-	-	-	-	-	-	658	-	-	-	-	-	-	-	-
Molybdenite	5	690	690	-	-	-	-	-	-	-	-	-	-	692	-	-
Molybdenum (Mo)	1	654	654	-	-	654	656	658	660	663	665	667	669-675	677	-	679
Molybdenum coated with boron	6-II	-	-	-	-	-	-	-	-	-	-	-	1289	-	-	-
Molybdenum coated with carbon	6-II	-	-	-	-	-	-	-	-	-	-	1293	1295	-	-	-
Molybdenum coated with silicide	6-II	-	-	-	-	-	-	-	-	-	-	-	1467-1469	1471	-	-
Molybdenum coated with titanium (di-)oxide and aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	1395	-	-	-
Molybdenum coating on iron	6-II	-	-	-	-	-	-	-	-	-	-	1309	1311	-	-	-
Molybdenum + ΣX_i	2-II	1109	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum + Iron	2-I	285	-	-	-	-	-	287	289	-	-	-	-	-	-	-
Molybdenum + Nickel + ΣX_i	2-II	1099	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum + Niobium + ΣX_i	2-II	1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum + Silicon	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum + Titanium	2-I	-	-	-	-	-	-	-	-	-	-	-	291	-	-	-
Molybdenum + Titanium + ΣX_i	2-II	1103	-	-	-	-	293	295	297	299	301	-	303-307	309	-	-
Molybdenum + Tungsten	2-I	-	-	-	-	-	-	1105	-	-	1107	-	-	-	-	-
Molybdenum aluminides							-	311	313	315	317	-	319	-	-	-
MoAl	6-I	-	9	-	-	-										
$MoAl_2$	6-I	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-
Mo_3Al	6-I	-	9	-	-	-	-	-	-	-	11	-	-	-	-	-
							-	-	-	-	-	-	-	-	-	-

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Molybdenum beryllides																
$MoBe_2$	6-I	-	102	-	-	-	-	-	-	-	-	-	-	-	-	-
$MoBe_{12}$	6-I	102	-	-	-	-	-	104	106	-	-	-	-	-	-	-
Molybdenum borides																
MoB	6-I	-	186	-	-	-	-	188	-	-	-	-	-	-	-	192
MoB_2	6-I	-	186	186	-	-	-	188	-	-	190	-	-	-	-	-
Mo_2B	6-I	-	186	-	-	-	-	188	-	-	-	-	-	-	-	192
Mo_2B_5	6-I	-	186	-	-	-	-	-	-	-	-	-	-	-	-	-
Mo_3B_2	6-I	-	186	-	-	-	-	-	-	-	-	-	-	-	-	-
(Di-) molybdenum boride + + Molybdenum (di-) silicide	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
(Di-) molybdenum boride + + (Penta-) niobium (tri-) - silicide	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
(Di-) molybdenum boride + + Tantalum (di-) silicide	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
(Di-) molybdenum boride + + (Penta-) tantalum (tri-) - silicide	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum carbides																
MoC	5	-	-	-	-	-	-	-	-	-	87	-	-	-	-	-
Mo_2C	5	77	77	-	-	-	79	81	83	-	85	-	89	-	-	-
Molybdenum chromium silicides																
(Mo, Cr, Si)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$(Mo, Cr)Si_2$	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum germanide (Mo_3Ge_2)	6-I	-	313	-	-	-	-	-	-	-	-	-	-	-	-	315
Molybdenum nitride (Mo_3N)	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum oxides																
MoO_2	4-I	-	-	-	-	-	-	285	-	-	-	-	-	-	-	-
MoO_3	4-I	283	283	283	-	-	-	287	-	-	-	-	-	289	-	291
Molybdenum phosphide (MoP)	5	635	635	-	-	-	639	-	-	-	-	-	-	-	-	-
Molybdenum selenides ($MoSe_2$)	6-I	-	-	-	-	-	367	-	369	-	-	-	-	-	-	-
Molybdenum silicides																
$MoSi_2$	6-I	433	433	-	-	-	435	437	439	-	441	-	445-447	449	-	-
Mo_3Si	6-I	-	-	-	-	-	-	-	-	-	443	-	-	-	-	451
Mo_5Si_3	6-I	433	433	-	-	-	-	-	-	-	443	-	-	-	-	-
Molybdenum (di-) silicide + + Calcium aluminate	5	-	-	-	-	-	-	-	-	-	904	-	-	-	-	-
Molybdenum (di-) silicide + + Chromium (sesqui-) oxide	5	-	-	-	-	-	-	-	-	-	-	-	906	-	-	-
Molybdenum (di-) silicide + + Chromium (di-) silicide	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (di-) silicide + + Copper cermets	6-II	923	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Molybdenum (di-)silicide + + Molybdenum (tri-)oxide. . .	5	-	-	-	-	-	-	-	-	-	-	-	908-910	912	-	-
Molybdenum (di-)silicide + + Molybdenum (tri-)oxide + + Silicon (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	914-916	918	-	-
Molybdenum (di-)silicide + + Silicon (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	920-922	924	-	-
Molybdenum (di-)silicide + + Zirconium (di-)boride . . .	6-I	-	689, 724	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum-silicon-titanium cermet	6-II	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum sulfide (MoS_2). . .	5	690	690	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum tellurides ($MoTe_2$).	6-I	-	-	-	-	-	638	-	640	-	-	-	-	692	-	-
Molybdenum-titanium alloys coated with Chromalloy W-2 .	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum-titanium alloy coated with Durak-MG	6-II	-	-	-	-	-	-	-	-	-	-	-	1505-1509	-	-	-
Molybdenum-zirconium intermetallics (Mo_2Zr)	6-I	-	684	-	-	-	-	-	-	-	-	-	1501-1503	-	-	-
Monel	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
. . . . .	2-II	-	-	-	-	-	-	-	-	-	343	-	-	-	-	-
Monel 400	2-II	-	-	-	-	-	-	1239	1241	-	1247-1251	-	1253	-	-	-
Monel 401	2-II	-	-	-	-	-	-	1239	1241	-	1247-1249	-	1253	-	-	-
Monel 403	2-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
Monel 404	2-II	-	-	-	-	-	-	-	-	-	1249	-	-	-	-	-
Monel 501	2-II	-	-	-	-	-	-	-	-	-	1251	-	-	-	-	-
Monel, H-	2-II	-	-	-	-	-	-	-	-	-	1245	-	-	-	-	-
Monel, K-	2-II	1237	-	-	-	-	-	-	1241	-	-	-	-	-	-	-
Monel K-500	2-II	1237	-	-	-	-	-	1239	1241	1243	1245	-	-	-	-	-
Monel 5700, K-	2-II	-	-	-	-	-	-	1239	1241	1243	1245	-	-	-	-	-
Monel, KR-	2-II	-	-	-	-	-	-	-	-	-	-	-	1255	-	-	-
Monel, R	2-II	-	-	-	-	-	-	-	-	-	1245	-	-	-	-	-
Monel, R-405	2-II	-	-	-	-	-	-	-	1241	-	1247	-	-	-	-	-
Monel, S-	2-II	-	-	-	-	-	-	-	1241	-	1247	-	-	-	-	-
Monel, Si-	2-II	-	-	-	-	-	-	-	1241	-	-	-	-	-	-	-
Moplen	6-II	1076	1076	-	-	-	-	-	1241	-	-	-	-	-	-	-
Mullite	4-II	-	-	-	-	-	-	1078	1080	-	1088	-	-	-	-	-
Mullite MV-20	4-II	-	-	-	-	-	-	1189	1191	1193	1197	-	1201	-	1203	-
Mullite MV-30	4-I	-	-	-	-	-	-	-	-	1193	-	-	1201	-	-	-
										-	617	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Mullite + Alumina	4-II	-	-	-	-	-	-	-	1562	-	-	-	-	-	-	-
Muscovite	4-II	-	-	-	-	-	-	1573	-	-	-	-	-	-	-	-
MX-4926 carbon-phenolic laminate	6-II	-	-	-	-	-	-	1134	-	-	-	-	-	-	-	-
Mylar coated with aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1287	-	-
Mylar coated with copper	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1301	-	-
Mylar coated with gold	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1307	-	-
Mylar coated with silver	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1323	-	-
N																
NBS coating A-418 on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1361-1363	-	-	-
NBS coating A-418 on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1365-1367	-	-	-
NBS coating N-143 on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1353-1355	-	-	-
NBS coating N-143 on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1357-1359	-	-	-
Neodymia	4-I	293	293	-	-	-	-	295	-	-	297	-	-	-	-	-
Neodymium (Nd)	1	681	681	681	681	682	684	686	-	-	688	-	-	-	-	690
Neodymium + Magnesium	2-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium + Magnesium + ΣX_j	2-II	1115	1115	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium aluminide (NdAl)	6-I	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-bismuth intermetallics (NdBi)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium borides																
NdB_4	6-I	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NdB_6	6-I	296	296	-	-	-	300	-	-	-	-	-	-	-	-	-
Neodymium-cadmium intermetallics																
NdCd	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NdCd_2$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NdCd_3$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NdCd_{11}$	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium carbides																
NdC_2	5	294	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium chloride ($NdCl_3$)	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-cobalt intermetallics ($NdCo_5$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-copper intermetallics ($NdCu_5$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-gallium intermetallics ($NdGa_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Neodymium germanides ($NdGe_2$)	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium hydride (NdH_2)	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-lead intermetallics ($NdPb_3$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-mercury intermetallics (NdHg)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-nickel intermetallics ($NdNi_5$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium nitride (NdN)	5	621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-osmium intermetallics ($NdOs_2$)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium oxides																
NdO	4-I	293	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd_2O_3	4-I	293	293	-	-	-	-	295	-	-	297	-	-	-	-	-
Neodymium phosphide (NdP)	5	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium selenides																
NdSe	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd_2Se_3	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd_3Se_4	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium silicide ($NdSi_2$)	6-I	523	524	-	-	-	527	-	-	-	-	-	-	-	-	-
Neodymium-silver intermetallics (NdAg)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium sulfides																
NdS	5	694	694	-	-	-	-	-	-	-	696	-	-	-	-	-
NdS_2	5	-	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd_2S_3	5	694	694	-	-	-	-	-	-	-	696	-	-	-	-	-
Nd_3S_4	5	694	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Neoprene GN	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	-	-	-
Neoprene W	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nepheline syenite	4-II	-	-	-	-	-	-	-	-	-	1320	-	-	-	-	-
Neptunium (Np)	1	692	692	-	-	-	-	-	-	-	-	-	-	-	-	-
Neptunium + Calcium + ΣX_i	2-II	1111	-	-	-	-	-	1113	-	-	-	-	-	-	-	-
Neptunium + Uranium	2-I	321	321	-	-	-	-	-	-	-	-	-	-	-	-	-
Neptunium bromide ($NpBr_3$)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neptunium chlorides																
$NpCl_3$	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NpCl_4$	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neptonium (di-)oxide (NpO_2)	4-I	-	-	-	-	-	-	299	-	-	-	-	-	-	-	-
Nichrome	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (Ni)	1	694	694	-	-	-	696	698	700	702	704	706	331 708-714	- 716-718	-	720
Nickel, carbonyl	1	-	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel, electrolytic	1	694	694	-	-	-	-	698	-	-	704	-	-	716	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nickel coated with aluminum phosphate	6-II	-	-	-	-	-	-	-	-	-	-	-	1429	-	-	-
Nickel + ΣX_i	2-II	1307	-	-	-	-	1309	1311	1313	1315	-	-	-	-	-	-
Nickel + Aluminum	2-I	-	-	-	-	-	325	-	-	-	-	-	-	-	-	-
Nickel + Aluminum + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1117	-	-	-	-	-
Nickel + Chromium	2-I	-	-	-	-	-	327	329	-	-	-	-	331-333	-	-	-
Nickel + Chromium + ΣX_i	2-II	1119, 1122	1119	-	-	-	1124	1126-1132	1134-1145	1148-1150	1152-1170	-	1172-1201	1203-1215	-	-
Nickel + Cobalt	2-I	335	-	-	-	-	-	-	337	-	-	-	-	-	-	-
Nickel + Cobalt + ΣX_i	2-II	1219	1217	-	-	-	1221	-	1223	-	1225-1227	-	1229-1231	-	-	-
Nickel + Copper	2-I	-	-	-	-	-	339	341	-	-	343	-	-	-	-	-
Nickel + Copper + ΣX_i	2-II	1237	-	-	-	-	-	1239	1241	1243	1245-1251	-	1253-1255	-	-	-
Nickel + Iron	2-I	-	-	-	-	-	345	347	349	-	-	-	-	-	-	-
Nickel + Iron + ΣX_i	2-II	1257	-	-	-	-	-	1259	1261	-	1263-1267	-	1269	-	-	-
Nickel + Manganese	2-I	-	-	-	-	-	351	-	353	-	355	-	-	-	-	-
Nickel + Manganese + ΣX_i	2-II	-	-	-	-	-	-	1271	-	-	1273	-	-	-	-	-
Nickel + Molybdenum + ΣX_i	2-II	1277	1275	-	-	-	-	1279	1281	-	1283-1287	1289	1291-1295	1297	-	-
Nickel + Palladium	2-I	-	-	-	-	-	357	-	-	-	-	-	-	-	-	-
Nickel + Palladium + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1299	-	-	-	-	-
Nickel + Silicon	2-I	-	-	-	-	-	359	-	-	-	-	-	-	-	-	-
Nickel + Silicon + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1301	-	-	-	-	-
Nickel + Titanium + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1303	-	-	-	-	-
Nickel + Tungsten + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1305	-	-	-	-	-
Nickel 200	2-I	-	-	-	-	-	-	-	-	-	355	-	-	-	-	-
(also)	2-II	1307	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel 204	2-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
Nickel 211	2-I	-	-	-	-	-	-	-	-	-	355	-	-	-	-	-
Nickel 270	1	-	-	-	-	-	-	-	-	-	704	-	-	-	-	-
Nickel A	1	-	-	-	-	-	-	-	700	-	-	-	-	-	-	-
(also)	2-I	-	-	-	-	-	-	-	-	-	355	-	-	-	-	-
(also)	2-II	1307	-	-	-	-	-	-	1313	-	-	-	-	-	-	-
Nickel, admiralty	2-II	-	-	-	-	-	-	-	-	-	988	-	-	-	-	-
Nickel D	2-I	-	-	-	-	-	-	-	-	-	355	-	-	-	-	-
(also)	2-II	-	-	-	-	-	-	-	1313	-	-	-	-	-	-	-
Nickel, grade A	1	694	-	-	-	-	-	-	700	-	704	706	710-712	718	-	-
(also)	2-I	-	-	-	-	-	-	-	353	-	-	-	-	-	-	-
(also)	2-II	-	-	-	-	-	-	-	1223	-	1263, 1301	-	-	-	-	-
Nickel L	1	-	-	-	-	-	-	-	700	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nickel alloys (special designations)																
60 - 15 Cr (ASTM B83-46)	2-II	1257	-	-	-	-	-	1259	-	-	-	-	-	-	-	-
80 Ni - 20 Cr	2-II	-	-	-	-	-	-	1130	1144	-	-	-	-	-	-	-
90 Ni - 10 Cr	2-II	-	-	-	-	-	-	1126	-	-	-	-	-	-	-	-
AISI alloy (see AISI designations)																
Alumel	2-II	-	-	-	-	-	-	1271	-	-	-	-	-	-	-	-
Astroloy	2-II	-	-	-	-	-	-	-	-	-	-	-	1229	1231	-	-
Brazing alloys GE-62	2-II	-	-	-	-	-	-	-	-	-	1168	-	-	-	-	-
Brazing compound GEH 62-V	2-II	-	-	-	-	-	-	1130	-	-	-	-	-	-	-	-
Chromel-P	2-I	-	-	-	-	-	-	329	-	-	-	-	-	-	-	-
Contracid	2-II	-	-	-	-	-	-	-	1261	-	-	-	-	-	-	-
D-979	2-II	-	-	-	-	-	-	-	1261	-	-	-	-	-	-	-
Duranickel 301	2-II	-	-	-	-	-	-	-	-	-	1117	-	-	-	-	-
DVL 32	2-II	1219	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
DVL 321a	2-II	1219	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
DVL 321i	2-II	1219	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
DVL 325a	2-II	1219	-	-	-	-	-	-	-	-	1225	-	-	-	-	-
EI-435	2-II	-	-	-	-	-	-	1132	1144	1150	-	-	-	-	-	-
EI-437	2-II	-	-	-	-	-	-	-	1140	-	-	-	-	-	-	-
EI-607	2-II	-	-	-	-	-	-	-	1145	-	1158	-	-	-	-	-
EI-617	2-II	-	-	-	-	-	-	-	-	-	1170	-	-	-	-	-
GMR-235	2-II	-	-	-	-	-	-	-	-	-	1161	-	-	-	-	-
Haskins alloy 667	2-II	-	-	-	-	-	-	-	-	-	1273	-	-	-	-	-
Haynes alloy no. R-41	2-II	-	-	-	-	-	-	-	-	-	1154	-	-	-	-	-
Haynes alloy X	2-II	-	-	-	-	-	-	-	-	-	-	-	1172	-	-	-
Hastelloys (see Hastelloy)																
HU	2-II	-	-	-	-	-	-	-	-	-	1265	-	-	-	-	-
HW	2-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
Illium alloy	2-II	-	-	-	-	-	-	-	-	-	1156	-	-	-	-	-
Illium G	2-II	-	-	-	-	-	-	-	1136	-	-	-	-	-	-	-
Illium R	2-II	-	-	-	-	-	-	-	1138	-	-	-	-	-	-	-
Inco (see Inco)																
Incoloys (see Incoloy)																
Inconels (see Inconel)																
INOR-8	2-II	-	-	-	-	-	-	-	1281	-	1285	-	1293	-	-	-
J-1500	2-II	-	-	-	-	-	-	-	1136	-	1166	-	-	-	-	-
J-1610	2-II	-	-	-	-	-	-	-	1134	-	1156	-	-	-	-	-
M-252	2-II	-	-	-	-	-	-	1130	1136	-	1166	-	1180, 1197	1209, 1215	-	-
Monels (see Monel)																

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Nickel alloys (special designations) (cont.)																
Ni-O-Nel	2-II	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
Nichrome	2-I	-	-	-	-	-	-	-	-	-	-	-	331	-	-	-
Nichrome V	2-II	-	-	-	-	-	-	1130	1144	-	-	-	-	-	-	-
Nimonics (see Nimonic)																
OKh 20N60B	2-II	-	-	-	-	-	-	1132	1136	1150	-	-	-	-	-	-
OKh 21N78T	2-II	-	-	-	-	-	-	1132	-	1150	-	-	-	-	-	-
Permanickel 300	2-II	1257	-	-	-	-	-	-	-	-	1303	-	-	-	-	-
RCA-N91	2-I	-	-	-	-	-	-	-	337	-	-	-	-	-	-	-
RCA-N97	2-I	-	-	-	-	-	-	-	337	-	-	-	-	-	-	-
Refractaloy 26	2-II	-	-	-	-	-	-	-	1223	-	-	-	-	-	-	-
Rene 41	2-II	1122	-	-	-	-	-	1130	1134	-	1156	-	1184, 1199	1211	-	-
SM-200	2-II	-	-	-	-	-	-	-	-	-	1305	-	-	-	-	-
Udimets (see Udimet)																
Unitemp Waspalloy	2-II	-	-	-	-	-	-	-	1138	-	-	-	-	-	-	-
Waspalloy	2-II	-	-	-	-	-	-	-	1136	-	1154	-	-	-	-	-
Nickel aluminate ($NiO \cdot Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1021	-	1023	-	-	-
Nickel aluminides																
NiAl	6-I	-	-	-	-	-	-	-	-	-	13	-	15-17	19	-	-
Ni_3Al	6-I	-	-	-	-	-	-	-	-	-	13	-	15-17	19	-	-
Nickel aluminides coating on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	1453-1455	1457	-	-
Nickel aluminide + Aluminum oxide	5	-	-	-	-	-	-	-	-	-	-	-	844-846	848	-	-
Nickel aluminide + Nickel (mon-) oxide	5	-	-	-	-	-	-	-	-	-	-	-	850-852	854	-	-
Nickel aluminide + Nickel (mon-) oxide + Aluminum oxide	5	-	-	-	-	-	-	-	-	-	-	-	856-858	860	-	-
Nickel borides																
Ni_2B	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_3B	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_3B_2	6-I	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel carbide (Ni_3C)	5	-	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel chrome spinel coating on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel chromite coating on niobium-zirconium alloy	6-II	-	-	-	-	-	-	-	-	-	-	-	1387	-	-	-
													1387	-	-	-

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Nickel-chromium alloy coating on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1333	1335	-	-
Nickel ferride (Ni_3Fe)	6-I	-	-	-	-	-	-	-	-	-	304	-	-	-	-	-
Nickel ferrite ($NiO \cdot Fe_2O_3$)	4-II	-	-	-	-	-	1087	1089	-	-	1091	-	-	-	-	-
Nickel ferrite spinal	4-II	-	-	-	-	-	-	1089	-	-	-	-	-	-	-	-
Nickel-lead silicate glass	4-II	-	-	-	-	-	1773	-	-	-	-	-	-	-	-	-
Nickel-manganese intermetallics (Ni_3Mn)	6-I	-	-	-	-	-	652	654	-	-	-	-	-	-	-	-
Nickel (mon-)oxide (NiO)	4-I	-	-	-	-	-	-	301	303	-	305	-	307-309	311	-	-
Nickel (mon-)oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	765	-	-	-	-	-	-	-
Nickel (mon-)oxide + Nickel aluminide	5	-	-	-	-	-	-	-	-	-	-	-	777-779	781	-	-
Nickel phosphides																
Ni_2P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_3P	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
$Ni_{12}P_5$	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel selenides																
$NiSe_{1.0-2.05}$	6-I	345	-	-	-	-	-	347	-	-	-	-	-	-	-	-
Nickel silicides																
NiSi	6-I	-	453	-	-	-	-	-	-	-	-	-	-	-	-	-
$NiSi_2$	6-I	-	453	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_2Si	6-I	-	453	-	-	-	-	-	-	-	455	-	-	-	-	-
Ni_3Si	6-I	-	453	-	-	-	-	-	-	-	455	-	-	-	-	-
Ni_3Si_2	6-I	-	453	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel-tantalum intermetallics (Ni_3Ta)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel tellurides																
NiTe	6-I	-	-	-	-	-	-	604	-	-	-	-	-	-	-	-
$NiTe_{1.1-1.5}$	6-I	-	-	-	-	-	-	604	-	-	-	-	-	-	-	-
$NiTe_2$	6-I	-	-	-	-	-	-	604	-	-	-	-	-	-	-	-
Nickel titanate ($NiO \cdot TiO_2$)	4-II	-	-	-	-	-	1452	-	-	-	-	-	-	-	-	-
Nickel zinc ferrite ($Ni_xZn_{1-x}O \cdot Fe_2O_3$)	4-II	-	-	-	-	-	-	1093	1095	-	-	-	-	-	-	-
Nickel-zirconium intermetallics																
NiZr	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_3Zr	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni_4Zr	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Nimonic 75	2-II	-	-	-	-	-	-	-	1144	-	-	-	1182	-	-	-
Nimonic 80	2-II	-	-	-	-	-	-	-	1140	-	-	-	-	-	-	-
Nimonic 80/80A	2-II	-	-	-	-	-	-	-	1140	-	-	-	-	-	-	-
Nimonic 90	2-II	-	-	-	-	-	-	-	1136	-	-	-	-	-	-	-
Nimonic 95	2-II	-	-	-	-	-	-	-	1136	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nimonic 100	2-II	1219	1217	-	-	-	-	-	1223	-	1227	-	-	-	-	-
Nimonic 105	2-II	-	-	-	-	-	-	-	1223	-	-	-	-	-	-	-
Niobium (Nb)	1	722	722	-	-	-	724	726	728	730	732	-	734-438	740	-	742
Niobium coated with aluminide	6-II	-	-	-	-	-	-	-	-	-	-	-	1435-1437	1439	-	-
Niobium coated with niobium aluminide	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1459	-	-
Niobium + ΣX_i	2-II	-	-	-	-	-	-	1361	-	-	-	-	-	-	-	-
Niobium + Iron + ΣX_i	2-II	-	-	-	-	-	-	1317	-	-	-	-	-	-	-	-
Niobium + Molybdenum + ΣX_i	2-II	1319	-	-	-	-	-	1321	1323	1325	1327	-	-	-	-	-
Niobium + Tantalum	2-I	-	361	-	-	-	363	-	365	-	-	-	-	-	-	-
Niobium + Tantalum + ΣX_i	2-II	-	-	-	-	-	-	1329	1331	1333	1335	-	-	-	-	-
Niobium + Titanium	2-I	-	-	-	-	-	367	-	-	-	-	-	-	-	-	-
Niobium + Titanium + ΣX_i	2-II	1337	-	-	-	-	-	1339	1341	1343	1345	-	1347	-	-	-
Niobium + Tungsten	2-I	-	-	-	-	-	-	-	-	-	-	-	369-371	-	-	-
Niobium + Tungsten + ΣX_i	2-II	-	-	-	-	-	-	1349	1351	1353	1355	-	-	-	-	-
Niobium + Uranium	2-I	-	-	-	-	-	-	-	373	-	375	-	-	-	-	-
Niobium + Vanadium	2-I	-	-	-	-	-	377	-	-	-	-	-	-	-	-	-
Niobium + Vanadium + ΣX_i	2-II	-	-	-	-	-	-	-	1357	-	1359	-	-	-	-	-
Niobium + Zirconium	2-I	-	-	-	-	-	379	381	383	-	385	-	387-389	-	-	-
Niobium alloys (special design.)																
5 Mo - 5 V - Zr	2-II	-	-	-	-	-	-	1321	-	1325	-	-	-	-	-	-
27 Ta - 12 W - 0.5 Zr	2-II	-	-	-	-	-	-	1329	-	1333	-	-	-	-	-	-
10 Ti - 5 Zr	2-II	-	-	-	-	-	-	1339	-	1348	-	-	-	-	-	-
10 W - 1 Zr - 0.1 C	2-II	-	-	-	-	-	-	1349	-	1353	-	-	-	-	-	-
10 W - 5 Zr	2-II	-	-	-	-	-	-	1349	-	1353	-	-	-	-	-	-
15 W - 5 Mo - 1 Zr	2-II	-	-	-	-	-	-	1349	-	-	-	-	-	-	-	-
15 W - 5 Mo - 1 Zr - 0.5 C	2-II	-	-	-	-	-	-	-	-	1353	-	-	-	-	-	-
B-66	2-II	-	-	-	-	-	-	-	-	-	1327, 1359	-	-	-	-	-
Cb-752	2-II	-	-	-	-	-	-	1349	-	-	1355	-	-	-	-	-
F-48	2-II	-	-	-	-	-	-	1349	-	-	1355	-	-	-	-	-
Ferroniobium	2-II	-	-	-	-	-	-	1317	-	-	-	-	-	-	-	-
FS-82	2-II	-	-	-	-	-	-	-	-	-	1335	-	-	-	-	-
FS-82B	2-II	-	-	-	-	-	-	1329	-	-	1335	-	-	-	-	-
FS-85	2-II	-	-	-	-	-	-	-	-	-	1335	-	-	-	-	-
MAR-M200	2-II	-	-	-	-	-	-	-	-	-	1305	-	-	-	-	-
Niobium aluminide ($NbAl_3$)	6-I	-	21	-	-	-	-	-	-	-	-	-	-	23	-	-
Niobium aluminide coating on niobium	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1459	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Niobium beryllides																
$NbBe_{11}$	6-I	-	108	-	-	-	-	-	-	-	-	-	-	-	-	-
$NbBe_{12}$	6-I	-	108	-	-	-	-	110	112	-	114	-	116	120	-	-
Nb_2Be_{17}	6-I	-	-	-	-	-	-	-	112	-	-	-	116-118	120	-	-
Niobium borides																
NbB	6-I	-	194	-	-	-	-	-	-	-	-	-	-	-	-	-
NbB_2	6-I	194	194	-	-	-	-	196	-	-	198	-	200-202	-	-	-
Nb_3B_2	6-I	-	194	-	-	-	-	-	-	-	-	-	-	-	-	-
Nb_3B_4	6-I	-	194	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium (di-)boride + Zirconium (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium carbide (NbC)	5	91	91	-	-	-	93	95-97	99	-	101	-	104-106	-	-	-
Niobium-chromium intermetallics ($NbCr_2$)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium-cobalt intermetallics ($NbCo_2$)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium ferride ($NbFe_2$)	6-I	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium germanides																
$NbGe_2$	6-I	323	323	-	-	-	-	-	327	-	-	-	-	-	-	-
Nb_3Ge	6-I	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
Nb_3Ge	6-I	323	323	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium germanide silicides ($NbGe_xSi_{1-x}$)	6-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium-manganese intermetallics ($NbMn_2$)	6-I	-	684	-	-	-	-	-	529	-	-	-	-	-	-	-
Niobium nitrides																
NbN	5	535	535	-	-	-	537	-	-	-	539	-	-	-	-	-
Nb_2N	5	-	535	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium oxides																
NbO	4-I	-	-	-	-	-	-	315	-	-	-	-	-	-	-	-
NbO_2	4-I	-	-	-	-	-	-	317	-	-	-	-	-	-	-	-
Nb_2O_5	4-I	313	-	313	-	-	-	319	-	-	321	-	-	-	-	-
Niobium (pent-)oxide + + Aluminum oxide	4-I	-	767	-	-	-	-	-	-	-	769	-	-	-	-	-
Niobium (pent-)oxide + + Beryllium oxide	4-I	-	771	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium (pent-)oxide + + Magnesium oxide	4-I	-	773	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium (pent-)oxide + + Titanium (di-)oxide	4-I	-	775	-	-	-	-	-	-	-	777	-	-	-	-	-
Niobium (pent-)oxide + + Zirconium (di-)oxide	4-I	-	779	-	-	-	-	-	-	-	781	-	-	-	-	-
Niobium phosphide (NbP)	5	635	635	-	-	-	639	-	-	-	-	-	-	-	-	-
Niobium selenide ($NbSe_2$)	6-I	-	-	-	-	-	367	-	369	-	-	-	-	-	-	-

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Niobium silicides																
$NbSi_2$	6-I	-	-	-	-	-	527	-	529	-	-	-	-	-	-	-
Nb_4Si	6-I	-	457	-	-	-	-	-	-	-	-	-	-	-	-	-
Nb_5Si_3	6-I	-	457	-	-	-	-	-	-	-	459	-	-	-	-	-
(Penta-) niobium (tri-) silicide + + (Di-) molybdenum boride	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium silicide germanides																
NbSiGe	6-I	-	-	-	-	-	317	-	319	-	-	-	-	-	-	-
$NbSi_{1-X}Ge_X$	6-I	-	-	-	-	-	317	-	319	-	-	-	-	-	-	-
Niobium stannide (Nb_3Sn)	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Niobium telluride ($NbTe_2$)	6-I	-	-	-	-	-	606	-	608	-	-	-	-	-	-	-
Niobium-zirconium alloy coated with barium titanate	6-II	-	-	-	-	-	-	-	-	-	-	-	1369	-	-	-
Niobium-zirconium alloy coated with boron	6-II	-	-	-	-	-	-	-	-	-	-	-	1291	-	-	-
Niobium-zirconium alloy coated with calcium titanate	6-II	-	-	-	-	-	-	-	-	-	-	-	1371	-	-	-
Niobium-zirconium alloy coated with iron titanate	6-II	-	-	-	-	-	-	-	-	-	-	-	1385	-	-	-
Niobium-zirconium alloy coated with nickel chromite	6-II	-	-	-	-	-	-	-	-	-	-	-	1387	-	-	-
Niobium-zirconium alloys coated with silicon carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1415	-	-	-
Nodular cast iron	3	-	-	-	-	-	-	-	35-37, 437	-	41, 444	-	-	-	-	-
Nodular cast iron, ferritic base	3	-	-	-	-	-	-	-	37	-	-	-	-	-	-	-
Nodular cast iron, pearlitic base	3	-	-	-	-	-	-	-	35	-	41	-	-	-	-	-
Nycar PA-21	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nylon	6-II	-	-	-	-	-	-	1047	-	-	1049	-	-	-	-	-
Nylon 1 N fabrics	6-II	-	-	-	-	-	-	-	-	1273	-	-	-	-	-	-
Nylon 6	6-II	-	-	-	-	-	-	1047	-	-	1049	-	-	-	-	-
Nylon 9	6-II	-	-	-	-	-	-	-	-	-	1049	-	-	-	-	-
Nylon 11	6-II	-	-	-	-	-	-	-	-	-	1049	-	-	-	-	-
Nylon 11 N fabric	6-II	-	-	-	-	-	-	-	-	1273	-	-	-	-	-	-
Nylon 66	6-II	-	-	-	-	-	-	-	-	-	1049	-	-	-	-	-
Nylon fabric	6-II	-	-	-	-	-	-	-	-	1273	-	-	-	-	-	-
Nylon FM-1	6-II	-	-	-	-	-	-	-	-	-	1049	-	-	-	-	-

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O																
OFHC copper	1	-	-	-	-	-	-	-	458	460	-	-	-	-	-	-
Opalon 300 FM	6-II	-	1076	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic fiber cloth	6-II	-	-	-	-	-	-	-	-	-	1275	-	-	-	-	-
Osmium (Os)	1	744	744	-	-	-	746	-	748	-	-	-	750	-	-	-
P																
Palatinol AH	6-II	-	-	-	-	-	-	-	1086	-	-	-	-	-	-	-
Palladium (Pd)	1	752	752	-	-	-	754	756	758	-	-	760	762-764	766	-	-
Palladium + Cobalt + ΣX_i	2-II	-	1363	-	-	-	1366-1368	-	-	-	-	-	-	-	-	-
Palladium + Copper + ΣX_i	2-II	-	1370	-	-	-	-	1372	-	-	-	-	-	-	-	-
Palladium + Gold + ΣX_i	2-II	-	1374	-	-	-	1376	-	-	-	-	-	-	-	-	-
Palladium + Nickel	2-I	-	-	-	-	-	391	-	-	-	-	-	-	-	-	-
Palladium + Nickel + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1378	-	-	-	-	-
Palladium + Uranium	2-I	-	393	-	-	-	-	-	-	-	-	-	-	-	-	-
Palladium aluminides																
PdAl	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Pd_3Al	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Palladium beryllides																
PdBe	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
$PdBe_{12}$	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Palladium brazing alloy GE-76	2-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Palladium tellurides																
PdTe	6-I	-	-	-	-	-	-	-	-	1378	-	-	-	-	-	-
$PdTe_2$	6-I	-	-	-	-	-	-	610	-	-	-	-	-	-	-	-
Panelyte, grade 942	6-II	-	-	-	-	-	-	610	-	-	-	-	-	-	-	-
Paraplex P43	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Penton 1215	6-II	-	1076	-	-	-	-	-	-	1107	-	-	-	-	-	-
Perbunan 18	6-II	-	-	-	-	-	-	-	-	978	-	-	-	-	-	-
Perbunan 26	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perbunan 35	6-II	-	-	-	-	-	-	-	1060	-	-	-	-	-	-	-
Periclase	4-I	-	-	-	-	-	-	-	1060	-	-	-	-	-	-	-
Periclase, synthetic	4-I	-	-	-	-	-	-	-	1060	-	-	-	-	-	-	-
Permanickel 300	2-II	1257	-	-	-	-	-	254	-	-	-	-	-	-	-	-
Phenacite, synthetic	4-II	-	-	-	-	-	-	254	-	-	-	-	-	-	-	-
Phenol formaldehyde	6-II	-	-	-	-	-	-	-	-	1303	-	-	-	-	-	-
Phenol formaldehyde, asbestos filled	6-II	-	-	-	-	-	-	-	-	1223	-	-	-	-	-	-
Phenol formaldehyde, ceramic filled	6-II	-	-	-	-	-	-	-	-	986	-	-	-	-	-	-
Phenol formaldehyde, cord filled	6-II	-	-	-	-	-	-	-	-	988	-	-	-	-	-	-
										990	-	-	-	-	-	-
										992	-	-	-	-	-	-

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Phenol formaldehyde, cotton flock filled	6-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
Phenol formaldehyde, fabric filled	6-II	-	-	-	-	-	-	-	-	-	996	-	-	-	-	-
Phenol formaldehyde, stupalith A-2412	6-II	-	-	-	-	-	-	-	-	-	990	-	-	-	-	-
Phenol formaldehyde, wood flour filled	6-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
Phenolic, alpha cellulose paper reinforced	6-II	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
Phenolic, cotton fabric reinforced	6-II	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
Phenolic, LMI 304 nylon reinforced	6-II	-	-	-	-	-	1103	-	-	-	-	-	-	-	-	-
Phenolic, long glass fiber reinforced	6-II	-	-	-	-	-	1103	-	-	-	-	-	-	-	-	-
Phenolic and epoxide copolymer resin, reinforced	6-II	-	-	-	-	-	-	-	-	-	1126	-	-	-	-	-
Phenolic novolak	6-II	-	-	-	-	-	982	-	-	-	-	-	-	-	-	-
Phenolic, reinforced	6-II	-	-	-	-	-	1103	-	-	-	1105-1107	-	-	-	-	-
Phenolic resin	6-II	980	-	-	-	-	982	-	984	1082	-	-	-	-	-	-
Phenolic resin, reinforced	6-II	1130	-	-	-	-	-	1132-1146	1148-1156	1159-1170	1172-1179	-	-	-	-	-
Phenolic resin, type S	6-II	980	-	-	-	-	-	-	984	1082	-	-	-	-	-	-
Phenolites																
Phenolite	6-II	-	-	-	-	-	-	-	-	-	1101, 1176	-	-	-	-	-
NEMA C	6-II	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
NEMA L	6-II	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
NEMA LE	6-II	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
NEMA X	6-II	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
NEMA XP	6-II	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
NEMA XXX	6-II	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
NEMA XXXP	6-II	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
XXXP	6-II	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
Phenyl silane resin	6-II	-	-	-	-	-	-	1074	-	-	-	-	-	-	-	-
Phenyl silane resin, reinforced	6-II	-	-	-	-	-	-	1212	-	1220	-	-	-	-	-	-
Phenyl silane SC-1013 Monsanto	6-II	-	-	-	-	-	-	1074	-	-	-	-	-	-	-	-
Phosphate glass	4-II	1649	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus (pent-)oxide + + Zirconium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	787	-	-	-	-	-
Pittsburg no. 3235 glass	4-II	-	-	-	-	-	-	1697	-	-	-	-	1705	1709	1711-1713	-
Plate glass	4-II	1779	-	-	-	-	-	1791	1783	1793	1797	-	-	-	-	-
Plate glass no. 9330	4-II	-	-	-	-	-	-	1791	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Platinum (Pt)	1	768	768	-	-	-	770	772	774	776	778	780	782-788	790	-	-
Platinum coating on copper	6-II	-	-	-	-	-	-	-	-	-	-	-	1313	-	-	-
Platinum coating on quartz	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1317	1319	-
Platinum coating on stainless steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1315	-	-	-
Platinum + Copper	2-I	-	-	-	-	-	395-397	-	-	-	-	-	-	-	-	-
Platinum + Iron	2-I	-	-	-	-	-	399	-	-	-	401	-	-	-	-	-
Platinum + Rhodium	2-I	-	-	-	-	-	-	-	403	-	-	-	405	407	-	-
Platinum arsenide (Pt_2As_3)	6-I	-	94	-	-	-	-	-	-	-	-	-	-	-	-	-
Platinum beryllide ($PtBe_{12}$)	6-I	158	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Platinum stannide (Pt_3Sn)	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Platinum sulfides																
PtS	5	-	-	-	-	-	-	698	-	-	-	-	-	-	-	-
PtS_2	5	-	-	-	-	-	-	698	-	-	-	-	-	-	-	-
Platinum tellurides																
PtTe	6-I	-	-	-	-	-	-	612	-	-	-	-	-	-	-	-
$PtTe_2$	6-I	-	-	-	-	-	-	612	-	-	-	-	-	-	-	-
Plexiglas 11	6-II	-	-	-	-	-	-	-	-	-	1026	-	-	-	-	-
Plexiglas AN-P-44A	6-II	1020	1020	-	-	-	-	1022	1024	-	1026	-	-	-	-	-
Plutonium (Pu)	1	794	792	-	792	-	796	799	-	-	801	-	-	-	-	-
Plutonium + Cerium + ΣX_i	2-II	-	-	-	-	-	-	1380	-	-	-	-	-	-	-	-
Plutonium + Osmium	2-I	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium + Thorium	2-I	411	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium beryllide ($PuBe_{13}$)	6-I	158	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium bromide ($PuBr_3$)	5	3	3	3	3	3	-	-	-	-	-	-	-	-	-	5
Plutonium carbides																
PuC	5	-	-	-	-	-	110	112	-	-	114	-	-	-	-	-
Pu_2C_3	5	108	-	-	-	-	-	-	-	-	117	-	-	-	-	-
Plutonium chloride ($PuCl_3$)	5	327	327	327	327	327	-	-	-	-	-	-	-	-	-	329
Plutonium ferrides																
$PuFe_2$	6-I	306	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Pu_6Fe	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium fluoride (PuF_3)	5	389	389	389	389	389	-	-	-	-	-	-	-	-	-	391
Plutonium iodide (PuI_3)	5	471	471	471	471	471	-	-	-	-	-	-	-	-	-	473
Plutonium-lead intermetallics ($PuPb_3$)	6-I	-	671	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium-manganese intermetallics ($PuMn_2$)	6-I	671	671	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium-nickel intermetallics																
PuNi	6-I	-	671	-	-	-	-	-	-	-	-	-	-	-	-	-
$PuNi_2$	6-I	-	671	-	-	-	-	-	-	-	-	-	-	-	-	-
$PuNi_5$	6-I	-	671	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Plutonium nitride (PuN)	5	-	-	-	-	-	-	-	-	-	541	-	-	-	-	-
Plutonium-osmium intermetallics ($PuOs_2$)	6-I	671	671	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium oxides																
PuO	4-I	-	-	-	-	323	-	-	-	-	-	-	-	-	-	329
PuO_2	4-I	323	323	-	-	-	-	325	-	-	327	-	-	-	-	329
Plutonium silicide ($PuSi_2$)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polonium (Po)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803
Polybutadiene	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	-	-	-
Polychlorotrifluoroethylene	6-II	-	-	-	-	-	-	-	1037	-	1045	-	-	-	-	-
Polyester, glass fiber reinforced	6-II	-	-	-	-	-	-	-	-	-	1109	-	-	-	-	-
Polyester, unsaturated	6-II	-	-	-	-	-	-	-	-	-	968	-	-	-	-	-
Polyester resin, reinforced	6-II	1180	-	-	-	-	-	1191	1195-1198	1220	1200	-	-	-	-	-
Polyethylene	6-II	1030	-	-	-	-	-	-	1037	-	1045	-	-	-	-	-
Polyethylene, halogenated	6-II	1030	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Polyethylene PE 575	6-II	-	1030	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyfluorobutyl acrylate rubber	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyisoprene	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	-	-	-
Polymethyl methacrylate	6-II	-	-	-	-	-	-	-	-	-	1026	-	-	-	-	-
Polymethyl methacrylate, alumina filled	6-II	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, boron phosphate filled	6-II	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, calcium carbonate filled	6-II	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, silica filled	6-II	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, zinc oxide filled	6-II	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polypropylene	6-II	1076	1076	-	-	-	-	1078	1080	-	1088	-	-	-	-	-
Polystyrene	6-II	-	1076	-	-	-	-	-	1090	-	1092	-	-	-	-	-
Polystyrene, Grade 912A	6-II	-	-	-	-	-	-	-	-	-	1092	-	-	-	-	-
Polystyrene foam	6-II	-	-	-	-	-	-	-	1090	-	-	-	-	-	-	-
Polytetrafluoroethylene	6-II	-	-	-	-	-	-	1035	1039	-	1045	-	-	-	-	-
Polytetrafluoroethylene laminate	6-II	-	-	-	-	-	-	1214	1218	1220	-	-	-	-	-	-
Polythene, germanium (di-)oxide filled	6-II	-	-	-	-	-	-	-	-	-	1041	-	-	-	-	-
Polythene, iron(ic) oxide filled	6-II	-	-	-	-	-	-	-	-	-	1041	-	-	-	-	-
Polythene, scandium oxide filled	6-II	-	-	-	-	-	-	-	-	-	1041	-	-	-	-	-
Polythene PM-1	6-II	-	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Polyurethane foam	6-II	962	-	-	-	-	-	-	964	-	966	-	-	-	-	-
Polyvinyl carbazole	6-II	-	-	-	-	-	-	970	972	-	-	-	-	-	-	-
Polyvinyl chloride	6-II	-	1076	-	-	-	-	-	1086	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Polyvinyl chloride, cellular	6-II	-	-	-	-	-	-	-	1086	-	-	-	-	-	-	-
Porcelain	5	1003	-	-	-	-	1005-1013	1015	1017	-	1019-1021	-	-	-	-	-
Porcelain 7A2	5	-	-	-	-	-	-	-	1017	-	-	-	-	-	-	-
Porcelain 576	5	1003	-	-	-	-	-	-	1017	-	-	-	-	-	-	-
Porcelain, aluminum oxide	5	1003	-	-	-	-	-	1015	1017	-	-	-	-	-	-	-
Porcelain, cone 14	5	-	-	-	-	-	1007	-	-	-	-	-	-	-	-	-
Porcelains, electrical																
K-3 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
K-5 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
K-6 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
K-7 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
K-8 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
K-9 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
Li-K-1 body	5	-	-	-	-	-	1005	-	-	-	-	-	-	-	-	-
Li-K-2a body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Li-K-2b body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Li-K-2c body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Li-K-2d body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Li-K-2e body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Lithium modified	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Pelalite body	5	-	-	-	-	-	1011	-	-	-	-	-	-	-	-	-
Porcelain, feldspar, dinnerware cone 12-14	5	-	-	-	-	-	1007	-	-	-	-	-	-	-	-	-
Porcelain, zircon	5	1003	-	-	-	-	1013	-	1017	-	1021	-	-	-	-	-
Potassium aluminum silicates	4-II	-	-	-	-	-	-	-	-	-	1316-1318	-	-	-	-	-
Potassium aluminum silicate + + Iron(ic) oxide	4-II	-	-	-	-	-	-	1573	-	-	-	-	-	-	-	-
Potassium borate glass	4-II	1605	-	-	-	-	1607	-	-	-	-	-	-	-	-	-
Potassium bromide (KBr)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium chloride (KCl)	5	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-
Potassium feldspar	4-II	-	-	-	-	-	-	-	-	-	-	-	-	331	-	-
Potassium fluoride + Lithium fluoride	5	-	-	-	-	-	-	409	-	-	1316-1318	-	-	-	-	-
Potassium mica	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium sodium aluminum silicates	4-II	-	-	-	-	-	-	-	-	-	1001	-	-	-	-	-
Potassium uranate ($K_2O \cdot UO_3$)	4-II	-	1482	-	-	-	-	-	-	-	1320	-	-	-	-	-
Potassium lead silicate glass	4-II	-	-	-	-	-	1777	-	-	-	-	-	-	-	-	-
Potassium silicate glass	4-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium (Pr)	1	805	805	805	805	-	807	809	-	-	1775	-	-	-	-	-
Praseodymium + ΣX_i	2-II	-	1382	-	-	-	-	-	-	-	-	-	-	-	-	811

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Praseodymium + Magnesium . .	2-I	413	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium + Neodymium . .	2-I	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-
Praseodymium + Silicon	2-I	-	-	-	-	-	-	417	-	-	-	-	-	-	-	-
Praseodymium aluminides																
PrAl	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrAl_2$	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrAl_4$	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_3Al_2	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-bismuth intermetallics (PrBi)	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium borides																
PrB_4	6-I	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PrB_6	6-I	295-296	-	-	-	-	300	-	-	-	-	-	-	-	-	-
Praseodymium bromide ($PrBr_3$)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-cadmium intermetallics																
PrCd	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCd_2$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCd_3$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCd_{11}$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium carbides																
PrC_2	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium chloride ($PrCl_3$).	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-cobalt intermetallics																
$PrCo_2$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCo_5$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-copper intermetallics																
PrCu	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCu_2$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCu_4$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrCu_6$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-gallium intermetallics ($PrGa_2$)	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium germanides																
PrGe	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrGe_2$	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-gold intermetallics																
PrAu	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrAu_2$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-

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Praseodymium-gold intermetallics (cont.)																
$PrAu_3$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Au	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium hydride (PrH_2)	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-indium intermetallics																
$PrIn_3$	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_3In	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-lead intermetallics																
PrPb	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrPb_3$	6-I	673	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Pb	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-magnesium intermetallics																
PrMg	6-I	673	674	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrMg_3$	6-I	673	674	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrMg_8$	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_4Mg	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-mercury intermetallics (PrHg)	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-nickel intermetallics ($PrNi_5$)	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-osmium intermetallics ($PrOs_2$)	6-I	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium oxides																
$PrO_{1.70-1.83}$	4-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	335
Pr_6O_{11}	4-I	-	-	-	-	-	-	331	-	-	333	-	-	-	-	-
Praseodymium phosphide (PrP)	5	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium selenides																
PrSe	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Se_3	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_3Se_4	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium silicides ($PrSi_2$)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-silver intermetallics																
PrAg	6-I	673	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrAg_2$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrAg_3$	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium stannides																
$PrSn_3$	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Sn	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Sn_3	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Praseodymium sulfides																
PrS	5	700	-	-	-	-	-	-	-	-	702	-	-	-	-	-
PrS_2	5	700	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2S_3	5	700	-	-	-	-	-	-	-	-	702	-	-	-	-	-
Pr_3S_4	5	700	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Praseodymium-thallium intermetallics																
PrTl	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
$PrTl_3$	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr_2Tl	6-I	-	674	-	-	-	-	-	-	-	-	-	-	-	-	-
Promethium (Pm)	1	-	813	813	-	813	-	-	-	-	-	-	-	-	-	-
Protactinium (Pa)	1	815	815	-	-	-	-	-	-	-	-	-	-	-	-	-
Protactinium oxide (PaO)	4-I	337	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Protoenstatite	4-II	-	-	-	-	-	-	-	-	-	1295	-	-	-	-	-
Pu-Ce-Co eutectic alloy	2-II	-	-	-	-	-	-	1380	-	-	-	-	-	-	-	-
Pyrex 774	4-II	1693	-	-	-	-	-	-	1699	1701	1703	-	1707	1709	1713	-
Pyrex 7740	4-II	-	-	-	-	-	-	1697	-	1701	-	-	1705	1709	1711-1713	-
Pyrex glasses	4-II	1693	-	-	-	-	-	1697	1699	1701	1703	-	1705-1707	1709	1711-1713	-
Pyrocerams																
Pyroceram 9606	4-II	-	-	-	-	-	-	1587	1589	1591	-	-	1593-1599	1601	1603	-
Pyroceram 9608	4-II	-	-	-	-	-	-	1587	1589	1591	-	-	1593-1599	1601	1603	-
Pyroceram 9690	4-II	-	-	-	-	-	-	-	-	1591	-	-	-	-	-	-
Pyrolytic carbon	1	83	-	-	-	-	-	-	89	-	-	-	-	-	-	-
Pyrolytic carbon EYX-4	1	-	-	-	-	-	-	-	89	-	-	-	-	-	-	-
Pyrolytic graphite	1	-	-	-	-	-	-	-	317	-	319	-	325-331	333-335	-	-
Pyrolytic graphite coating on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1297-1299	-	-	-
Pyrolytic graphite + Zirconium (pyro-) carbide	5	-	-	-	-	-	-	-	-	-	745	-	-	-	-	-
Q																
Quartz	4-I	353	353	-	-	-	355	357	361	365	-	-	-	379	381	-
Quartz coated with magnesium fluoride	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1425	1427	-
Quartz coated with platinum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1317	1319	-
Quartz glass	4-II	1651	-	-	-	-	1653	1655	1657	-	-	-	-	-	-	-

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R																
Rene 41	2-II	1122	-	-	-	-	-	1130	1134	-	1156	-	1184, 1199	1211	-	-
Resimene 814 resin	6-II	-	1014	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium (Re)	1	817	817	-	-	817	820	822	824	-	826	-	828-832	-	-	834
Rhenium + Tungsten	2-I	-	419	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium arsenide (Re_3As_7)	6-I	-	-	-	-	-	96	-	-	-	-	-	-	-	-	-
Rhenium phosphide (ReP)	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium selenide ($ReSe_2$)	6-I	-	-	-	-	-	349	-	351	-	-	-	-	-	-	-
Rhenium silicides																
ReSi	6-I	-	461	-	-	-	-	-	-	-	463	-	-	-	-	465
$ReSi_2$	6-I	-	461	-	-	-	-	-	-	-	463	-	-	-	-	465
Re_3Si	6-I	-	461	-	-	-	-	-	-	-	-	-	-	-	-	465
Rhodium (Rh)	1	836	836	-	-	-	838	840	842	-	-	-	844-848	850	-	-
Rhodium germanides																
RhGe	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rh_2Ge	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rh_3Ge_4	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rh_5Ge_3	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rokide A coating on AISI 446	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1351	-	-
Rokide C coating on titanium alloy 6 Al - 4 V	6-II	-	-	-	-	-	-	-	-	-	-	-	1345-1347	-	-	-
Rubbers																
Board no. 2266, cellular	6-II	-	-	-	-	-	-	-	1056	-	-	-	-	-	-	-
Buna	6-II	1051	-	-	-	-	-	1054	1056	1066	-	-	-	-	-	-
Dielectric mix	6-II	-	-	-	-	-	-	-	1056	-	-	-	-	-	-	-
Natural	6-II	1051	-	-	-	-	-	-	1056	1058	1068	-	-	-	-	-
Perbunan	6-II	1051	-	-	-	-	-	1054	1056	1060	-	-	-	-	-	-
Silicone	6-II	-	-	-	-	-	-	-	-	1064	1068	-	-	-	-	-
Synthetic	6-II	1051	-	-	-	-	-	1054	1056	1060-1066	1068	-	-	-	-	-
Rubidium fluoride (RbF)	5	-	-	-	-	-	-	393	-	-	-	-	-	-	-	395
Ruthenium (Ru)	1	852	852	-	-	852	854	856	858	-	-	-	-	-	-	860
Ruthenium-tungsten intermetallics (Ru_2W_3)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Rutile	4-I	445	-	-	-	-	450	454	460	-	462	-	-	-	-	-

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S																
SAE 1006	3	-	-	-	-	-	-	-	-	329	-	-	-	-	-	-
SAE 1010	3	310	-	-	-	-	312	316	325	329	335	-	-	-	-	-
SAE 1018	3	-	-	-	-	-	-	-	-	333	-	-	-	-	-	-
SAE 1020	3	-	-	-	-	-	-	-	-	329	-	-	345-347	-	-	-
SAE 1045	3	-	-	-	-	-	-	-	-	333	-	-	-	-	-	-
SAE 3140	3	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-
SAE 4130	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
SAE 4340	3	-	-	-	-	-	-	-	387	395	-	-	-	-	-	-
SAE 8630	3	-	-	-	-	-	-	-	-	-	337	-	-	-	-	-
Samaria	4-I	339	339	-	-	-	-	341	-	-	343	-	345	-	-	-
Samarium (Sm)	1	862	862	862	862	862	864	866	-	-	-	-	-	-	-	-
Samarium-bismuth intermetallics (SmBi)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium borides																
SmB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SmB_6	6-I	295	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Samarium-cadmium intermetallics																
SmCd	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$SmCd_2$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$SmCd_{11}$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium carbides																
SmC_2	5	294	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Sm_2C_3	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium-cobalt intermetallics																
$SmCo_2$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$SmCo_5$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium ferrides																
$SmFe_2$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$SmFe_3$	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium-gallium intermetallics ($SmGa_2$)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium germanide ($SmGe_2$)	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium hydrides																
SmH_2	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SmH_3	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium-indium intermetallics ($SmIn_3$)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium-lead intermetallics ($SmPb_3$)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium-mercury intermetallics (SmHg)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Samarium-nickel intermetallics																
$SmNi_2$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$SmNi_5$	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium (sesqui-) oxide (Sm_2O_3)	4-I	339	339	-	-	-	-	341	-	-	343	-	345	-	-	-
Samarium (sesqui-) oxide + + Gadolinium oxide	4-I	-	-	-	-	-	-	-	783	-	-	-	-	-	-	-
Samarium (sesqui-) oxide + + Gadolinium oxide + + Dysprosium oxide + Yttrium oxide	4-I	785	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium phosphide (SmP)	5	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium selenides (SmSe)	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium silicides ($SmSi_2$)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium sulfides																
$SmS_{0.75}$	5	-	-	-	-	-	706	-	-	-	-	-	-	-	-	-
SmS	5	704	704	-	-	-	-	-	708	-	-	-	-	-	-	-
SmS_2	5	-	704	-	-	-	-	-	-	-	-	-	-	-	-	-
Sm_2S_3	5	704	704	-	-	-	-	-	-	-	-	-	-	-	-	-
Sm_3S_4	5	704	704	-	-	-	-	-	-	-	-	-	-	-	-	-
Sandwich panels, TAC-polyester skin and alkyd isocyanate foam core	6-II	-	-	-	-	-	-	1257	1259	-	-	-	-	-	-	-
Sapphire	4-I	41	41	-	-	-	43	8	45	-	47	-	-	-	-	-
Sapphire, synthetic	4-I	41	-	-	-	-	-	8	45	-	47	-	-	-	-	-
Scandia	4-I	347	347	-	-	-	-	349	-	-	351	-	-	-	-	-
Scandium (Sc)	1	868	868	868	868	868	870	872	-	-	874	-	-	-	-	876
Scandium boride (ScB_2)	6-I	204	204	-	-	-	-	-	-	-	206	-	-	-	-	-
Scandium carbide (ScC)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scandium nitride (ScN)	5	621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scandium oxide (Sc_2O_3)	4-I	347	347	-	-	-	-	349	-	-	351	-	-	-	-	-
Scandium selenide (Sc_2Se_3)	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scandium sulfide (Sc_2S_3)	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scandium telluride (Sc_2Te_3)	6-I	636	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selectron 400	6-II	1020	-	-	-	-	-	-	-	-	1026	-	-	-	-	-
Selectron 5026	6-II	-	-	-	-	-	-	-	-	-	968	-	-	-	-	-
Si 142 silicon	1	-	-	-	-	-	-	-	-	890	-	-	-	-	-	-
Silastic 160	6-II	-	-	-	-	-	-	-	-	1064	1068	-	-	-	-	-
Silastic 180	6-II	-	-	-	-	-	-	-	-	1064	-	-	-	-	-	-
Silica	4-I	353	353	-	-	-	355	357	359	363	367	-	373-375	377	-	-
Silica fabric	6-II	-	-	-	-	-	-	-	-	1277	-	-	-	-	-	-
Silica glass	4-II	1651	1651	-	-	-	1653	1655	1657	1659-1661	1663	-	1665-1667	1669	1671-1673	-
Silica rock	4-I	820, 826	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Silicide coating on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	1467-1469	1471	-	-
Silicide coating on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1473-1475	1477	-	-
Silicide coating on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1479-1481	1483	-	-
Silicide coating on tungsten	6-II	-	-	-	-	-	-	-	-	-	-	-	1485-1487	1489	-	-
Silicon (Si)	1	878	878	878	-	878	880-884	886	888	890	892	-	894-896	898	-	-
Silicon + ΣX_i	2-II	-	-	-	-	-	1384	1386	-	-	-	-	-	-	-	-
Silicon + Germanium	2-I	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon + Iron	2-I	-	-	-	-	-	-	423	425	-	427	-	-	-	-	-
Silicon alloys (special designations)																
Leboite	2-I	-	-	-	-	-	-	-	-	-	427	-	-	-	-	-
Silicon borides																
SiB_4	6-I	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
SiB_6	6-I	-	208	-	-	-	-	-	-	-	210	-	-	-	-	-
Silicon carbides																
(SiC)	5	119	119	-	-	-	121	123	125-127	-	129	-	131-135	137-139	-	-
Norton RC-4237	5	-	-	-	-	-	-	-	-	-	-	-	311	-	-	-
Silicon carbide coating on niobium-zirconium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1415	-	-	-
Silicon carbide coating on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1411-1413	-	-	-
Silicon carbide + Boron carbide	5	297	-	-	-	-	-	-	-	-	299	-	-	-	-	-
Silicon carbide + Carbon	5	-	-	-	-	-	-	807	-	-	809	-	811	-	-	-
Silicon carbide + Graphite	5	-	-	-	-	-	-	813	-	-	-	-	-	-	-	-
Silicon carbide + Graphite + Silicon	5	-	-	-	-	-	-	815	817	-	-	-	-	-	-	-
Silicon carbide + Magnesium oxide + Nickel aluminide cermet	6-II	-	-	-	-	-	-	-	-	-	854	-	-	-	-	-
Silicon carbide + Silicon	5	-	-	-	-	-	-	819	-	-	-	-	821	-	-	-
Silicon carbide + Silicon cermet	6-II	-	-	-	-	-	-	-	856	-	-	-	-	-	-	-
Silicon carbide + Silicon nitride	5	-	-	-	-	-	-	-	-	-	823	-	-	-	-	-
Silicon carbide + (Tetr-) boron carbide	5	297	-	-	-	-	-	-	-	-	299	-	-	-	-	-
Silicon carbide + ΣX_i	5	-	-	-	-	-	-	-	307	-	-	-	309-311	-	-	-
Silicon carbide foam	5	-	-	-	-	-	-	-	127	-	129	-	-	-	-	-
Silicon germanide (SiGe)	6-I	-	-	-	-	-	-	405	-	-	-	-	-	-	-	-
Silicon oxides																
SiO	4-I	-	-	-	-	-	-	-	-	-	-	-	371	-	-	-

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Silicon oxides (cont.)																
SiO_2	4-I	353	353	-	-	-	355	357	359-361	363-365	367-369	-	373-375	377-379	381	-
Silicon (di-)oxide coating on aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1391	-	-
Silicon (di-)oxide foam	4-I	-	-	-	-	-	-	-	-	-	369	-	-	-	-	-
Silicon (mon-)oxide coating on aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1389	-	-
Silicon (di-)oxide + ΣX_i	4-I	826	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (di-)oxide + Aluminum cermet	6-II	-	-	-	-	-	-	-	-	-	790	-	-	-	-	-
Silicon (di-)oxide + Aluminum oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	-	796	-	-	-	-	-	-
Silicon (di-)oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	789	792	-	794	-	-	-
Silicon (di-)oxide + Aluminum oxide + Iron(ic) oxide	4-I	-	-	-	-	-	-	-	798	800	802-812	-	-	-	-	-
Silicon (di-)oxide + Aluminum oxide + Iron(ic) oxide + + Magnesium oxide + Potassium (mon-)oxide	4-I	-	-	-	-	-	-	-	814	-	-	-	-	-	-	-
Silicon (di-)oxide + Calcium oxide	4-I	-	-	-	-	-	-	-	816	818	-	-	-	-	-	-
Silicon (di-)oxide + Iron(ic) oxide	4-I	820	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (di-)oxide + Molybdenum (di-)silicide	5	-	-	-	-	-	-	-	-	-	-	-	783-785	787	-	-
Silicon (di-)oxide + Titanium (di-)oxide	4-I	-	-	-	-	-	822	-	-	-	824	-	-	-	-	-
Silicon nitride (Si_3N_4)	5	543	543	-	-	-	-	545	547	-	549	-	551-553	555	-	-
Silicon nitride + Silicon carbide	5	840	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon telluride (SiTe)	6-I	614	614	-	-	-	616	-	640	-	-	-	-	-	-	-
Silicone DC-301	6-II	-	-	-	-	-	1113	-	-	-	-	-	-	-	-	-
Silicone GMGA 5003	6-II	-	-	-	-	-	1070	-	-	-	-	-	-	-	-	-
Silicone coating on Inconel	6-II	-	-	-	-	-	1495	-	-	-	-	-	-	-	-	-
Silicone, filled	6-II	-	-	-	-	-	1070	-	-	-	-	-	-	-	-	-
Silicone, reinforced	6-II	-	-	-	-	-	1113	-	-	-	-	-	-	-	-	-
Silicone foams																
Silicone foam R-7001	6-II	1084	-	-	-	-	-	-	1080	-	-	-	-	-	-	-
Silicone foam R-7002	6-II	1084	-	-	-	-	-	1072	1080	-	-	-	-	-	-	-
Silicone foam R-7091	6-II	1084	-	-	-	-	-	-	1080	-	-	-	-	-	-	-
Silicone resin	6-II	-	-	-	-	-	-	1072	-	-	-	-	-	-	-	-
Silicone resin, reinforced	6-II	1204	-	-	-	-	-	1206	1208, 1218	1220	1210	-	-	-	-	-
Sillimanite	4-II	-	-	-	-	-	-	1189	-	-	1195	-	1199	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Silver (Ag)	1	900	900	900	900	900	902	904	906	-	908	910	912-914	916-920	-	922
Silver coated with silver sulfide.	6-II	-	-	-	-	-	-	-	-	-	-	1433	1435	-	-	-
Silver coating on mylar	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1325	-	-
Silver lume	1	-	-	-	-	-	-	-	-	-	-	910	-	-	-	-
Silver + Aluminum	2-I	431	-	-	-	429	433	-	-	-	-	-	-	-	-	-
Silver + Cadmium	2-I	-	-	-	-	-	-	-	435	-	-	-	-	437	-	439
Silver + Copper	2-I	-	-	-	-	-	-	-	-	-	441	-	-	-	-	-
Silver + Gold	2-I	-	-	-	-	-	-	-	-	-	443	-	-	-	-	445
Silver + Lead	2-I	-	-	-	-	-	-	-	-	-	447	-	-	-	-	-
Silver + Magnesium	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	449
Silver + Manganese	2-I	-	-	-	-	-	451	-	-	-	-	-	-	-	-	-
Silver + Palladium	2-I	-	-	-	-	-	458	-	-	-	-	-	-	-	-	-
Silver + Platinum	2-I	-	-	-	-	-	455	-	-	-	-	-	-	-	-	-
Silver + Zinc	2-I	459	457	457	-	-	-	-	-	-	-	-	-	461	-	-
Silver antimony telluride ($AgSbTe_2$)	6-I	-	-	-	-	-	620	-	-	622	-	-	-	-	-	-
Silver antimony telluride + + Germanium telluride	6-I	-	-	-	-	-	719	-	-	-	-	-	-	-	-	-
Silver antimony telluride + + Tin telluride	6-I	-	-	-	-	-	-	-	721	-	-	-	-	-	-	-
Silver beryllide ($AgBe_{12}$)	6-I	158	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver bromide (AgBr)	5	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-
Silver indium telluride ($AgInTe_2$)	6-I	-	-	-	-	-	624	-	640	-	-	-	-	-	-	-
Silver oxide (Ag_2O)	4-I	-	-	-	-	-	-	383	-	-	-	-	-	-	-	-
Silver plated AISI 321	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1321	-	-
Silver selenide (Ag_2Se)	6-I	-	-	-	-	-	-	353	355	-	-	-	-	-	-	-
Silver sulfide (Ag_2S)	5	-	-	-	-	-	-	710	-	-	-	-	-	-	-	-
Silver sulfide coating on silver	6-II	-	-	-	-	-	-	-	-	-	-	1431	1433	-	-	-
Silver tellurides (Ag_2Te)	6-I	-	-	-	-	-	-	618	-	-	-	-	-	-	-	-
Soda lime glass	4-II	-	-	-	-	-	-	-	-	-	-	-	1809	1811	1813-1815	-
Soda lime aluminosilicate glass	4-II	-	-	-	-	-	1817	-	-	-	-	-	-	-	-	-
Soda-lime silicate glass	4-II	-	-	-	-	-	-	1791	1795	1793	1797	-	1799	1801	-	-
Soda lime glass LOF.	4-II	-	-	-	-	-	-	-	-	-	-	-	1809	1811	1813-1815	-
Sodium aluminum borate glass	4-II	-	-	-	-	-	-	-	-	-	1627	-	-	-	-	-
Sodium aluminum silicates ($Na_2O \cdot Al_2O_3 \cdot 4\ SiO_2$)	4-II	-	-	-	-	-	-	1324	-	-	1326	-	-	-	-	-
Sodium barium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1789	-	-	-	-	-
Sodium beryllium borate glass	4-II	-	-	-	-	-	-	-	-	-	1629	-	-	-	-	-
Sodium borate glass	4-II	-	-	-	-	-	1607	-	-	-	-	-	-	-	-	-
Sodium borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1721	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Sodium calcium silicate ($Na_2O \cdot CaO \cdot SiO_2$)	4-II	-	-	-	-	-	-	1328	-	-	-	-	-	-	-	-
Sodium calcium silicate glass.	4-II	-	-	-	-	-	-	1791	1795	1793	1797	-	1799	1801	-	-
Sodium ferrite ($Na_2O \cdot Fe_2O_3$)	4-II	-	-	-	-	-	-	1097	-	-	-	-	-	-	-	-
Sodium fluoride + Beryllium ferride cermet	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Sodium fluoride + Zirconium fluoride + Uranium (tetra-) fluoride	5	-	-	-	-	-	-	411	-	-	-	-	-	-	-	-
Sodium lead silicate glass	4-II	-	-	-	-	-	1819	-	-	-	1803	-	-	-	-	-
Sodium magnesium borate glass.	4-II	-	-	-	-	-	-	-	-	-	1631	-	-	-	-	-
Sodium magnesium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1805	-	-	-	-	-
Sodium magnesium copper silicate glass	4-II	-	-	-	-	-	-	-	-	-	1807	-	-	-	-	-
Sodium manganese telluride ($Na_XMn_{1-X}Te$)	6-I	-	-	-	-	-	626	-	628	-	-	-	-	-	-	-
Sodium molybdates																
$Na_2O \cdot MoO_3$	4-II	-	-	-	-	-	-	1119	-	-	-	-	-	-	-	-
$Na_2O \cdot 2\ MoO_3$	4-II	-	-	-	-	-	-	1119	-	-	-	-	-	-	-	-
Sodium (mon-) oxide (Na_2O)	4-I	-	-	-	-	-	-	385	-	-	-	-	-	-	-	-
Sodium phosphorus uranate ($2\ NaO \cdot UO_3 \cdot P_2O_5$)	4-II	-	1482	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium potassium aluminum silicates	4-II	-	-	-	-	-	-	-	-	-	1330	-	-	-	-	-
Sodium potassium borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1723	-	-	-	-	-
Sodium silicates																
$Na_2O \cdot SiO_2$	4-II	-	-	-	-	-	-	1322	-	-	-	-	-	-	-	-
$Na_2O \cdot 2\ SiO_2$	4-II	-	-	-	-	-	-	1322	-	-	-	-	-	-	-	-
Sodium silicate glass	4-II	1779	-	-	-	-	1781	-	1783	-	1785-1787	-	-	-	-	-
Sodium silicate glass no. 23	4-II	-	-	-	-	-	-	1791	-	-	-	-	-	-	-	-
Sodium strontium alumino-silicate glass	4-II	-	-	-	-	-	-	-	-	-	1821	-	-	-	-	-
Sodium tellurate ($Na_2O \cdot TeO_3$)	4-II	-	-	-	-	-	-	1366	-	-	-	-	-	-	-	-
Sodium titanates																
$Na_2O \cdot TiO_2$	4-II	-	-	-	-	-	-	1454	-	-	-	-	-	-	-	-
$Na_2O \cdot 2\ TiO_2$	4-II	-	-	-	-	-	-	1454	-	-	-	-	-	-	-	-
$Na_2O \cdot 3\ TiO_2$	4-II	-	-	-	-	-	-	1454	-	-	-	-	-	-	-	-
Sodium tungstates																
$Na_2O \cdot WO_3$	4-II	-	-	-	-	-	-	1480	-	-	-	-	-	-	-	-
$Na_2O \cdot 2\ WO_3$	4-II	-	-	-	-	-	-	1480	-	-	-	-	-	-	-	-
Sodium tungsten oxide (Na_XWO_3)	4-II	-	-	-	-	-	-	-	-	-	1155	-	-	-	-	-
Sodium uranate ($Na_2O \cdot UO_3$)	4-II	-	1482	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Sodium vanadates																
$Na_2O \cdot V_2O_5$	4-II	-	-	-	-	-	-	1494	-	-	-	-	-	-	-	-
$2\ Na_2O \cdot V_2O_5$	4-II	-	-	-	-	-	-	1494	-	-	-	-	-	-	-	-
$3\ Na_2O \cdot V_2O_5$	4-II	-	-	-	-	-	-	1494	-	-	-	-	-	-	-	-
Sodium zinc borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1725	-	-	-	-	-
Solex 2808 plate glass	4-II	1779	-	-	-	-	-	1791	1783	1793	1797	-	-	-	-	-
Solex "S" plate glass	4-II	1779	-	-	-	-	-	1791	1783	1793	1797	-	-	-	-	-
Spektralkohle artificial graphite	1	-	-	-	-	-	-	-	360	-	-	-	-	-	-	-
Spinal, magnesium aluminate	4-II	1007	1007	-	-	-	1009	1011	1013	1015	1017	-	-	-	-	-
Spinal, magnesium aluminate, with sodium (mon-)oxide	4-II	-	-	-	-	-	-	1524	1526	1528	1530	-	-	-	-	-
Spinal, magnesium chromite	4-II	-	-	-	-	-	-	-	-	-	1059	-	-	-	-	-
Spinal, nickel ferrite	4-II	-	-	-	-	-	-	1089	-	-	-	-	-	-	-	-
Spinal, zinc chromate	4-II	-	-	-	-	-	-	-	-	-	1063	-	-	-	-	-
Spodumene	4-II	-	-	-	-	-	-	-	1266	-	1270	-	-	-	-	-
Sponge zirconium	1	-	-	-	-	-	1102	-	1106	-	-	-	-	-	-	-
	2-I	-	-	-	-	-	699	-	-	-	-	-	-	-	-	-
Stafoam 604	6-II	-	-	-	-	-	-	-	964	-	-	-	-	-	-	-
Stainless steel coated with NBS coating A-418	6-II	-	-	-	-	-	-	-	-	-	-	-	1365-1367	-	-	-
Stainless steel coated with NBS coating N-143	6-II	-	-	-	-	-	-	-	-	-	-	-	1357-1359	-	-	-
Stainless steel coated with platinum	6-II	-	-	-	-	-	-	-	-	-	-	-	1315	-	-	-
Steatite	4-II	1285	-	-	-	-	1287	-	1293	-	1295	-	-	-	-	-
Steatite, ultra-	4-II	-	-	-	-	-	1287	-	-	-	-	-	-	-	-	-
Steatite 10B-2	4-II	-	-	-	-	-	-	-	1293	-	-	-	-	-	-	-
Steatite 12C-2	4-II	-	-	-	-	-	-	-	1293	-	-	-	-	-	-	-
Steatite, grade L-4, AlSiMag 196	4-II	-	-	-	-	-	1287	-	-	-	-	-	-	-	-	-
Steatite, grade L-5, Pass and Seymour E-211-M	4-II	-	-	-	-	-	1287	-	-	-	-	-	-	-	-	-
Steels (special designations)																
1 Kh18N9T	3	-	-	-	-	-	-	161	-	-	215	-	-	-	-	-
1.1 C tool steel	3	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-
4 Kh13	3	-	-	-	-	-	-	73	-	-	-	-	-	-	-	-
12 MoV	3	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
15 KhM	3	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-
17-4 PH	3	145	-	-	-	-	-	157	170	-	199	-	-	-	-	-
17-5 MnV	3	-	-	-	-	-	-	-	-	-	116	-	-	-	-	-
17-7 PH	3	140	-	-	-	-	-	159	172	-	199, 203	231	255, 259, 270	282	-	-
17-10 P	3	-	-	-	-	-	-	-	-	-	227	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Steels (cont.)																
18 - 8	3	-	-	-	-	-	-	-	-	-	-	-	236, 241	-	-	-
18 - 8 Cr-Cu	3	-	-	-	-	-	-	-	-	-	-	-	-	138	-	-
18 - 20 Cr-Mn	3	-	-	-	-	-	-	-	-	-	-	-	-	348	-	-
18 - 21 Cr-Co	3	-	-	-	-	-	-	-	-	-	-	-	-	302	-	-
19 - 9 DL	3	-	-	-	-	-	-	-	-	189	211	-	-	-	-	-
19 - 9 DX	3	-	-	-	-	-	-	-	-	-	225	-	-	-	-	-
23 D 245	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
815	3	310	-	-	-	-	-	-	-	-	340	-	-	-	-	-
A-286	3	379	-	-	-	-	-	-	391	397	401	-	409-411	413	-	-
AISI steels (see AISI designations)																
Allegheny 18 - 8 M	3	-	-	-	-	-	149	-	-	-	-	-	-	-	-	-
Allegheny steels	3	-	-	-	-	-	-	-	-	-	-	-	257	-	-	-
AM350	3	-	-	-	-	-	-	-	170	-	199	231	236, 259, 268	280	-	-
AM355	3	-	-	-	-	-	-	157	170	-	199	-	-	-	-	-
AMS 2713	3	-	-	-	-	-	-	-	385	-	-	-	-	-	-	-
AMS 2714	3	-	-	-	-	-	-	-	387	-	-	-	-	-	-	-
ATS	3	140	-	-	-	-	-	-	-	-	221	-	-	-	-	-
B-759	3	-	-	-	-	-	-	-	-	-	106	-	-	-	-	-
Carbon steel ASTM A105 grade II	3	-	-	-	-	-	-	-	-	-	337	-	-	-	-	-
Cor-ten	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
DVL 4/V 869	3	-	-	-	-	-	-	-	-	-	403	-	-	-	-	-
DVL 30	3	140	-	-	-	-	-	-	-	-	225	-	-	-	-	-
DVL 31	3	-	-	-	-	-	-	-	-	-	403	-	-	-	-	-
DVL 46	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	-
DVL 47	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	-
DVL 48	3	-	-	-	-	-	-	-	-	-	217	-	-	-	-	-
DVL 49	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	-
DVL 50	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	-
DVL 51	3	140	-	-	-	-	-	-	-	-	227	-	-	-	-	-
DVL 52	3	140	-	-	-	-	-	-	-	-	225	-	-	-	-	-
EI-257	3	-	-	-	-	-	-	155	-	-	-	-	-	-	-	-
EI-572	3	-	-	-	-	-	-	-	178	-	215	-	-	-	-	-
EI-606	3	-	-	-	-	-	-	-	172	-	215	-	-	-	-	-
EI-783	3	-	-	-	-	-	-	-	-	-	215	-	-	-	-	-
EI-802	3	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
EI-855	3	-	-	-	-	-	-	383	394	397	-	-	-	-	-	-
EME	3	-	-	-	-	-	-	-	-	-	225	-	-	-	-	-

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Steels (cont.)																
En 8	3	-	-	-	-	-	312	-	325	-	-	-	-	-	-	-
En 19	3	-	-	-	-	-	61	-	83	-	-	-	-	-	-	-
En 31	3	-	-	-	-	-	61	-	83	-	-	-	-	-	-	-
FCM	3	311	-	-	-	-	-	-	-	-	341	-	-	-	-	-
Feni 36	3	-	-	-	-	-	-	-	-	-	369	-	-	-	-	-
G 17	3	-	-	-	-	-	-	-	391	-	-	-	-	-	-	-
GX 4881	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
Haynes alloy no. 90	3	-	-	-	-	-	-	-	-	-	106	-	-	-	-	-
Haynes alloy no. 93	3	-	-	-	-	-	-	-	-	-	106	-	-	-	-	-
HF grade	3	-	141	-	-	-	-	-	-	-	195	-	-	-	-	-
H. G. T. 3 (British design.)	3	55	-	-	-	-	61	-	81	-	102	-	-	-	-	-
High speed steel M1	3	-	-	-	-	-	-	-	351	-	-	-	-	-	-	-
High speed steel M2	3	-	-	-	-	-	-	-	450	-	-	-	-	-	-	-
High speed steel M10	3	-	-	-	-	-	-	-	351	-	-	-	-	-	-	-
High speed steel Ti	3	-	-	-	-	-	-	-	450	-	-	-	-	-	-	-
HNM crucible	3	-	-	-	-	-	-	161	176	-	227	-	-	-	-	-
HX 4249	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	-
Incoloys (see Incoloy)																
Invar H	3	-	-	-	-	-	-	-	-	-	369	-	-	-	-	-
Jessop no. 40	3	55	-	-	-	-	-	-	-	-	102	-	-	-	-	-
Jessop no. 46	3	55	-	-	-	-	-	-	-	-	104	-	-	-	-	-
Jessop G-18B	3	379	-	-	-	-	-	-	168	-	217	-	-	-	-	-
Jessop G-21	3	140	-	-	-	-	-	-	-	-	225	-	-	-	-	-
Jessop H-40	3	-	-	-	-	-	-	-	81	-	-	-	-	-	-	-
Jessop R-20	3	140	-	-	-	-	-	-	176	-	221	-	-	-	-	-
Kovar	3	-	-	-	-	-	-	-	363	-	-	-	-	-	-	-
Low carbon	3	-	-	-	-	-	-	319	-	-	-	-	-	-	-	-
Macloy G	3	-	-	-	-	-	-	-	393	-	-	-	-	-	-	-
Mark 12MX	3	-	-	-	-	-	-	323	-	-	-	-	-	-	-	-
Mark 1x18N9T	3	-	-	-	-	-	-	161	-	-	215	-	-	-	-	-
Mild steel	3	311	-	-	-	-	-	316	-	-	-	-	-	-	-	-
Multimet N-155	3	140	-	-	-	-	-	-	180	191	219	120	126-128, 253, 259	-	-	-
Multimet N-155, low carbon	3	-	-	-	-	-	-	-	296	-	-	-	-	-	-	-
Multimet NR-21 (AMS-55326)	3	140	-	-	-	-	-	-	-	-	219	-	-	-	-	-
Multimet NR-21, low carbon (AMS-53762)	3	-	-	-	-	-	-	-	-	-	219	-	-	-	-	-
N-A-X AC 9115	3	-	-	-	-	-	-	-	-	-	444	-	-	-	-	-
Ni-Span-C alloy 902	3	-	-	-	-	-	-	-	-	-	407	-	-	-	-	-
Okh 16N 36V3T	3	-	-	-	-	-	-	383	-	397	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Steels (cont.)																
P-193	3	379	-	-	-	-	-	-	-	-	405	-	-	-	-	-
PH 15-7 Mo	3	145	-	-	-	-	-	-	-	-	201	231	255, 259, 272	284	-	-
Porous	3	461	-	-	-	-	463	-	-	-	-	-	-	-	-	-
Rex 78	3	-	-	-	-	-	-	-	389	-	-	-	-	-	-	-
Roneusil	3	-	-	-	-	-	-	-	-	-	-	-	-	349	-	-
S-590	3	-	-	-	-	-	-	-	-	191, 298, 397	221	-	-	-	-	-
SAE steels (see SAE designations)																
SAS-8	3	140	-	-	-	-	-	-	-	-	227	-	-	-	-	-
Steel 15	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	-
Steel 19	3	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
Steel 35	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	-
Steel 45	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	-
Tenelon	3	-	-	-	-	-	-	-	-	-	116	-	-	-	-	-
U-8	3	-	-	-	-	-	-	10	-	12	-	-	-	-	-	-
Unitemp 212	3	-	-	-	-	-	-	-	391	-	-	-	-	-	-	-
V-444D	3	-	-	-	-	-	-	-	-	-	223	-	-	-	-	-
Vacromin F	3	-	-	-	-	-	-	-	393	-	-	-	-	-	-	-
Vascojet 1000	3	-	-	-	-	-	-	-	81	-	-	-	132	136	-	-
Vickers F. D. P.	3	-	-	-	-	-	-	-	-	-	-	-	257	-	-	-
W	3	-	-	-	-	-	-	-	-	-	203	-	-	-	-	-
WF100D	3	140	-	-	-	-	-	-	-	-	225	-	-	-	-	-
Steel, clad	6-II	-	-		-	-	-	-	-	-	1267	-	-	-	-	-
Stellite no. 3	2-II	-	-	-	-	-	-	-	-	-	904	-	-	-	-	-
Stellite no. 4	2-II	-	-	-	-	-	-	-	-	-	904	-	-	-	-	-
Stellite no. 6	2-II	-	-	-	-	-	-	-	-	-	902	-	-	-	-	-
Stellite no. 6B	2-II	-	-	-	-	-	-	-	-	-	902	-	-	-	-	-
Stellite no. 6K	2-II	-	-	-	-	-	-	-	-	-	902	-	-	-	-	-
Stellite no. 12	2-II	-	-	-	-	-	-	-	-	-	902	-	-	-	-	-
Stellite no. 19	2-II	-	-	-	-	-	-	-	-	-	904	-	-	-	-	-
Stellite no. 21 (AMS-5385; NR-10)	2-II	879	-	-	-	-	-	884	886	-	894	-	-	-	-	-
Stellite no. 23 (AMS-5375; NDRC-61)	2-II	879	-	-	-	-	-	-	886	-	900	-	-	-	-	-
Stellite no. 25 (L-605)	2-II	879, 882	-	-	-	-	-	-	-	890	898	-	908-914	916	-	-
Stellite no. 25 (L-605) coated with iron (ic) oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	1381-1383	-	-	-
Stellite no. 27 (AMS-5378; NR-60)	2-II	1219	-	-	-	-	-	-	1223	-	1225	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Stellite no. 30 (AMS-5380; NR-12)	2-II	879	–	–	–	–	–	–	–	–	896	–	–	–	–	–
Stellite no. 31 (AMS-5382; NR-71)	2-II	879	–	–	–	–	–	–	886	–	896	–	–	–	–	–
Stellite no. 36 (L-251)	2-II	879	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stellite 98M2	2-II	–	–	–	–	–	–	–	–	–	906	–	–	–	–	–
Stellite HE1049	2-II	–	–	–	–	–	–	884	888	–	900	–	–	–	–	–
Stellite Star J-metal	2-II	–	–	–	–	–	–	–	–	–	906	–	–	–	–	–
Strontium (Sr)	1	924	924	–	–	–	926	–	–	–	928	–	–	–	–	–
Strontium aluminates																
$SrO \cdot Al_2O_3$	4-II	1025	–	–	–	–	–	–	–	–	–	–	–	–	–	–
$SrO \cdot 2\ Al_2O_3$	4-II	–	1025	–	–	–	–	–	–	–	1027	–	–	–	–	–
$3\ SrO \cdot Al_2O_3$	4-II	1025	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Strontium aluminum silicate ($SrO \cdot Al_2O_3 \cdot 2\ SiO_2$)	4-II	–	–	–	–	–	–	–	–	–	1334	–	–	–	–	–
Strontium barium cerium titanate $[(Ba_{1-x-y}Sr_xCe_y)O \cdot TiO_2]$	4-II	–	–	–	–	–	1466	–	–	–	–	–	–	–	–	–
Strontium barium cerium titanate stannate $[(Ba_{1-x}Sr_{x-y}Ce_y)O \cdot (Ti_{1-z}Sn_z)O_2]$	4-II	–	–	–	–	–	1363	–	–	–	–	–	–	–	–	–
Strontium borate glass	4-II	–	–	–	–	–	–	–	–	–	163.	–	–	–	–	–
Strontium (hexa-)boride (SrB_6)	6-I	295	296	–	–	–	–	–	–	–	–	–	–	–	–	–
Strontium chloride ($SrCl_2$)	5	–	–	–	–	–	–	333	–	–	–	–	–	–	–	–
Strontium copper silicate ($SrO \cdot CuO \cdot 4\ SiO_2$)	4-II	–	–	–	–	–	–	–	–	–	1336	–	–	–	–	–
Strontium fluoride (SrF_2)	5	397	397	–	–	–	–	399	–	–	–	–	–	401	–	–
Strontium lead silicate glass	4-II	–	–	–	–	–	1823	–	–	–	–	–	–	–	–	–
Strontium oxide (SrO)	4-I	387	387	–	–	387	389	391	393	–	395	–	–	–	–	397
Strontium oxide + Lithium (meta-) aluminate + Aluminum oxide	4-II	–	–	–	–	–	–	–	1540	–	–	–	–	–	–	–
Strontium oxide + Lithium zirconium silicate + Aluminum oxide	4-II	–	–	–	–	–	–	–	1542	–	–	–	–	–	–	–
Strontium oxide + Lithium zirconium silicate + Zinc oxide	4-II	–	–	–	–	–	–	–	1544	–	–	–	–	–	–	–
Strontium oxide + Titanium (di-) oxide	4-I	–	828	–	–	–	–	–	–	–	–	–	–	–	–	–
Strontium oxide + Titanium (di-) oxide + Lithium zirconium silicate	4-II	–	–	–	–	–	–	–	1546	–	–	–	–	–	–	–
Strontium oxide + Zinc oxide + + Lithium zirconium silicate	4-II	–	–	–	–	–	–	–	1548	–	–	–	–	–	–	–
Strontium silicates																
$SrO \cdot SiO_2$	4-II	1332	1332	–	–	–	–	–	–	–	–	–	–	–	–	–
$2\ SrO \cdot SiO_2$	4-II	1332	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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Strontium sulfide (SrS)	5	-	-	-	-	-	-	712	-	-	-	-	-	-	-	-
Strontium titanates																
$SrO \cdot TiO_2$	4-II	1456	1456	-	-	-	1458	1460	1462	-	1464	-	-	-	-	-
$SrO \cdot 2\ TiO_2$	4-II	-	-	-	-	-	-	-	-	-	1464	-	-	-	-	-
$2\ SrO \cdot TiO_2$	4-II	-	-	-	-	-	-	1460	-	-	-	-	-	-	-	-
Strontium titanate coating on AISI 310	6-I	-	-	-	-	-	-	-	-	-	-	-	1393	-	-	-
Strontium titanate + Cobalt cermet	6-II	-	-	-	-	-	-	-	792	-	-	-	-	-	-	-
Strontium uranate ($SrO \cdot UO_3$)	4-II	-	1482	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium zirconate ($SrO \cdot ZrO_2$)	4-II	1514	-	-	-	-	-	1516	-	-	1518	-	-	-	-	-
Styrene-butadiene copolymer	6-II	-	-	-	-	-	-	1054	-	-	-	-	-	-	-	-
Styrofoam Q-103	6-II	-	-	-	-	-	-	-	1090	-	-	-	-	-	-	-
Super Dylon	6-II	1030	-		-	-	-	-	-	-	-	-	-	-	-	-
Supramica 557	5	-	-	-	-	-	987	-	-	-	-	-	-	-	-	-
Svea Iron	1	-	-	-	-	-	-	-	585	-	-	-	-	-	-	-
T																
TAC polyester	6-II	974	-	-	-	-	-	-	976	-	978	-	-	-	-	-
TAC polyester resin, reinforced	6-II	1180	-	-	-	-	-	1183	1185	1220	1187-1189	-	-	-	-	-
Talc	4-II	-	-	-	-	-	-	1289	-	-	-	-	-	-	-	-
Tan 9-4 tantalum	1	-	-	-	-	-	-	934	-	-	-	-	-	-	-	-
Tantalum (Ta)	1	930	930	-	-	930	932	934	936	938	940	942	944-950	952	-	954
Tantalum coated with aluminide	6-II	-	-	-	-	-	-	-	-	-	-	-	1441-1443	1445	-	-
Tantalum coated with cobalt oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	1373-1375	-	-	-
Tantalum coated with pyrolytic graphite	6-II	-	-	-	-	-	-	-	-	-	-	-	1297-1299	-	-	-
Tantalum coated with silicide	6-II	-	-	-	-	-	-	-	-	-	-	-	1473-1475	1477	-	-
Tantalum coated with silicon carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1411-1413	-	-	-
Tantalum coated with tantalum aluminide	6-II	-	-	-	-	-	-	-	-	-	-	-	1461-1463	1465	-	-
Tantalum + Copper + ΣX_i	2-II	1388	-	-	-	-	-	-	1390	-	1392	-	-	-	-	-
Tantalum + Niobium	2-I	-	-	-	-	-	463	-	465	-	-	-	-	-	-	-
Tantalum + Niobium + ΣX_i	2-II	-	-	-	-	-	-	1394	1396	1398	1400	-	-	-	-	-
Tantalum + Titanium	2-I	467, 549	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tantalum + Tungsten	2-I	-	-	-	-	-	-	469	471	473	475	477-479	-	-	-	-

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Tantalum + Tungsten + ΣX_i	2-II	–	1402	–	–	–	1404	1406	1408	1410	1412	–	–	–	–	–
Tantalum + Zirconium + ΣX_i	2-II	1414	–	–	–	–	–	1416	1418	–	1420	–	–	–	–	–
Tantalum alloys (special designations)																
30 Nb - 7.5 V	2-II	–	–	–	–	–	–	1394	–	1398	–	–	–	–	–	–
8 W - 2 Hf	2-II	–	1402	–	–	–	1404	1406	–	1410	–	–	–	–	–	–
Tantalum aluminide ($TaAl_3$)	6-I	–	–	–	–	–	–	–	–	–	–	–	–	25	–	–
Tantalum aluminides coating on tantalum	6-II	–	–	–	–	–	–	–	–	–	–	–	1461-1463	1465	–	–
Tantalum antimonide (TaSb)	6-I	–	–	–	–	–	71	–	73	–	–	–	–	–	–	–
Tantalum arsenide (Ta_2As_3)	6-I	–	–	–	–	–	96	–	–	–	–	–	–	–	–	–
Tantalum beryllides																
$TaBe_{12}$	6-I	–	122	–	–	–	–	124	126	–	128	–	130-132	134	–	–
Ta_2Be_{17}	6-I	–	122	–	–	–	–	124	126	–	128	–	130-132	134	–	–
Tantalum beryllide + Beryllium oxide	5	–	–	–	–	–	–	–	–	–	–	–	868-870	872	–	–
Tantalum beryllide + Beryllium oxide + Tantalum (pent-) oxide	5	–	–	–	–	–	–	–	–	–	–	–	874-876	878	–	–
Tantalum beryllide + Tantalum (pent-) oxide	5	–	–	–	–	–	–	–	–	–	–	–	880-882	884	–	–
Tantalum borides																
TaB	6-I	212	212	–	–	–	–	214	216	–	218	–	–	–	–	–
TaB_2	6-I	212	212	–	–	–	–	214	–	–	220	–	–	–	–	–
Ta_3B_2	6-I	–	212	–	–	–	–	–	–	–	–	–	–	–	–	–
Ta_3B_4	6-I	212	212	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum carbides																
TaC	5	141	141	–	–	–	143	145	147	149	151	–	154-158	–	–	160
Ta_2C	5	–	141	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum carbide coating on Inconel X	6-II	–	–	–	–	–	–	–	–	–	–	–	1417	1419	–	–
Tantalum carbide + Iron cermet	6-II	858	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum carbide + Tungsten cermet	6-II	–	–	–	–	–	–	–	–	–	860	–	–	–	–	–
Tantalum-cobalt intermetallics ($TaCo_2$)	6-I	–	684	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum-chromium intermetallics ($TaCr_2$)	6-I	–	684	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum ferrides ($TaFe_2$)	6-I	–	306	–	–	–	–	–	–	–	–	–	–	–	–	–
Tantalum germanides																
TaGe	6-I	–	–	–	–	–	925	–	–	–	–	–	–	–	–	–

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Tantalum germanides (cont.)																
$TaGe_2$	6-I	-	-	-	-	-	325	-	327	-	-	-	-	-	-	-
Ta_4Ge	6-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	321
Tantalum germanide silicides																
$TaGeSi_2$	6-I	-	-	-	-	-	-	-	529	-	-	-	-	-	-	-
$TaGe_xSi_{1-x}$	6-I	-	-	-	-	-	-	-	529	-	-	-	-	-	-	-
Tantalum iron lead oxide ($4\ PbO \cdot Fe_2O_3 \cdot Ta_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1157	-	-	-	-	-
Tantalum nitrides																
TaN	5	557	557	-	-	-	559	561	563	-	565	-	567-569	-	-	-
Ta_2N	5	-	557	-	-	-	-	-	-	-	-	-	-	-	-	-
Tantalum (pent-) oxide (Ta_2O_5)	4-I	-	-	-	-	-	-	399	-	-	401	-	403-405	407	-	-
Tantalum (pent-) oxide + + Tantalum beryllide	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tantalum phosphide (TaP)	5	635	636	-	-	-	639	-	-	-	-	-	-	789	-	-
Tantalum selenides ($TaSe_2$)	6-I	-	-	-	-	-	367	-	369	-	-	-	-	-	-	-
Tantalum silicides																
Ta_5Si_3	6-I	-	467	-	-	-	-	-	-	-	-	-	-	-	-	-
$TaSi_2$	6-I	-	467	-	-	-	527	469	529	-	471	-	473-475	477	-	-
Ta_2Si	6-I	-	467	-	-	-	-	-	-	-	-	-	-	-	-	-
Ta_3Si_2	6-I	-	467	-	-	-	-	-	-	-	-	-	-	-	-	-
$Ta_{4.5}Si$	6-I	-	467	-	-	-	-	-	-	-	-	-	-	-	-	-
(Penta-) tantalum (tri-) silicide + + (Di-) molybdenum boride	6-I	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
Tantalum silicide germanides																
$TaGe_{1-x}Si_x$	6-I	-	-	-	-	-	325	-	-	-	-	-	-	-	-	-
TaGeSi	6-I	-	-	-	-	-	325	-	-	-	-	-	-	-	-	-
Tantalum tellurides																
TaTe	6-I	-	-	-	-	-	-	-	640	-	-	-	-	-	-	-
$TaTe_2$	6-I	-	-	-	-	-	630	-	640	-	-	-	-	-	-	-
$Ta_{31}Te_3$	6-I	-	-	-	-	-	630	-	-	-	-	-	-	-	-	-
Tantalum tungsten selenide ($W_{1-x}Ta_xSe_2$)	6-I	-	-	-	-	-	357	-	-	-	-	-	-	-	-	-
Teflon	6-II	1030	-	-	-	-	-	1035	1039	-	1045	-	-	-	-	-
Teflon, type TF-1	6-II	1030	-	-	-	-	-	-	-	-	1045	-	-	-	-	-
Teflon, barium titanate filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-
Teflon, boron carbide filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-
Teflon, calcium boride filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-
Teflon, carbonyl iron grade HP filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-
Teflon, J-ferrite filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-
Teflon, J-mica filled	6-II	1032	-	-	-	-	-	-	-	-	1043	-	-	-	-	-

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Teflon laminate	6-II	–	–	–	–	–	–	1214	1218	1220	–	–	–	–	–	–
Teflon, litharge filled	6-II	1032	–	–	–	–	–	–	–	–	1043	–	–	–	–	–
Teflon, powdered iron-9 filled	6-II	1032	–	–	–	–	–	–	–	–	1043	–	–	–	–	–
Teflon, quartz no. 7900 filled	6-II	1032	–	–	–	–	–	–	–	–	1043	–	–	–	–	–
Teflon, reinforced	6-II	1097	–	–	–	–	–	–	1099	–	–	–	–	–	–	–
Teflon, titanium dioxide filled	6-II	1032	–	–	–	–	–	–	–	–	1043	–	–	–	–	–
Teflon, zero-plast type 6 filled	6-II	1032	–	–	–	–	–	–	–	–	1043	–	–	–	–	–
Television tube glass	4-II	–	–	–	–	–	–	–	–	–	–	–	1743	1745	1747	–
Tellurite	4-I	409	409	–	–	409	–	411	–	–	–	–	413	–	415	417
Tellurium (Te)	1	–	–	–	–	–	–	–	964	–	–	–	–	–	–	–
Tellurium + Chromium	2-I	–	–	–	–	–	481	483	–	–	–	–	–	–	–	–
Tellurium copper	2-I	–	–	–	–	–	–	–	–	–	152	–	–	–	–	–
Brass, tellurium-nickel	2-II	–	–	–	–	–	–	–	–	–	1002	–	–	–	–	–
Tellurium (di-)oxide (TeO_2)	4-I	409	409	–	–	409	–	411	–	–	–	–	413	–	415	417
Tellurium oxide - molybdenum oxide glass	4-II	–	–	–	–	–	–	–	–	–	1641	–	–	–	–	–
Tellurium oxide - tungsten oxide glass	4-II	–	–	–	–	–	–	–	–	–	1643	–	–	–	–	–
Tenite I 0072-MS	6-II	–	–	–	–	–	–	–	–	–	941	–	–	–	–	–
Tenite I 204-MS	6-II	–	–	–	–	–	–	–	–	–	946	–	–	–	–	–
Tenite II 205A-MS	6-II	–	–	–	–	–	–	–	–	–	946	–	–	–	–	–
Tenite G 204-H2	6-II	–	–	–	–	–	–	–	–	–	946	–	–	–	–	–
Tenite Q 264-H2	6-II	–	–	–	–	–	–	–	–	–	946	–	–	–	–	–
Tenite S 264-MS	6-II	–	–	–	–	–	–	–	–	–	946	–	–	–	–	–
Terbium (Tb)	1	956	956	956	956	956	958	960	–	–	962	–	–	–	–	–
Terbium borides																
TbB_4	6-II	295	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TbB_6	6-I	295	–	–	–	–	300	–	–	–	–	–	–	–	–	–
Terbium carbides																
TbC_2	5	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tb_2C_3	5	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Terbium-cobalt intermetallics ($TbCo_5$)	6-I	681	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Terbium-gallium intermetallics ($TbGa_2$)	6-I	681	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Terbium hydride (TbH_3)	5	467	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Terbium oxide ($TbO_{1.814}$)	4-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	419
Thorianite	4-I	421	421	–	–	422	425	428	430	–	432	–	435	–	–	437
Thorite	4-II	–	–	–	–	–	–	–	–	–	1338	–	–	–	–	–
Thorium (Th)	1	966	966	967	–	–	971	973	975	977	979	–	981	–	–	983
Thorium + Plutonium	2-I	411, 485	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Thorium + Titanium	2-I	–	–	–	–	–	–	–	–	–	487	–	–	–	–	–
Thorium + Uranium	2-I	–	–	–	–	–	489	–	–	–	–	–	–	–	–	–

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Thorium + Uranium + ΣX_i	2-II	-	1422	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium + Zirconium	2-I	-	-	-	-	-	-	-	-	-	491	-	-	-	-	-
Thorium + Zirconium + ΣX_i	2-II	-	1424	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium aluminate ($2\ ThO_2 \cdot 3\ Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1029	-	-	-	-	-
Thorium antimonides																
ThSb	6-I	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ThSb_2$	6-I	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Th_3Sb_4	6-I	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium borides																
ThB_4	6-I	222	222	-	-	-	224	226	228	-	230	-	232	-	-	-
ThB_6	6-I	-	222	-	-	-	224	-	-	-	-	-	-	-	-	-
Thorium carbides																
ThC	5	-	162	-	-	-	-	-	168	-	-	-	172	-	-	-
ThC_2	5	162	162	-	-	-	164	166	168	-	170	-	172	-	-	-
Thorium carbide + Uranium (di-) carbide	5	-	-	-	-	-	-	-	-	-	301	-	-	-	-	-
Thorium chloride ($ThCl_4$)	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium fluoride (ThF_4)	5	403	403	403	403	403	-	-	-	-	-	-	-	-	-	-
Thorium hydrides																405
ThH_2	5	439	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ThH_3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441
Thorium-manganese intermetallics																
$ThMn_{12}$	6-I	683	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Th_6Mn_{23}	6-I	683	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium nitrides																
ThN	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Th_3N_4	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide (ThO_2)	4-I	421	421	-	-	422	425	428	430	-	432	-	435	-	-	437
Thorium (di-) oxide, molybdenum fibers reinforced	6-II	-	-	-	-	-	-	-	1265	-	-	-	-	-	-	-
Thorium (di-) oxide + Aluminum oxide	4-I	-	830	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide + Aluminum oxide + Beryllium oxide	4-I	-	832	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide + Graphite	5	-	-	-	-	-	-	-	739	-	-	-	-	-	-	-
Thorium (di-) oxide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide + Uranium (di-) oxide	4-I	-	-	-	-	-	834	-	-	-	-	-	-	-	-	794
Thorium (di-) oxide + Uranium (di-) oxide + Yttrium oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium (di-) oxide + Zirconium (di-) oxide	4-I	-	-	-	-	-	-	-	-	-	838	-	-	-	-	836

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Thorium (ortho-) silicate ($ThO_2 \cdot SiO_2$)	4-II	-	-	-	-	-	-	-	-	-	1338	-	-	-	-	-
Thorium silicides																
ThSi	6-I	-	524	-	-	-	-	-	-	-	-	-	-	-	-	-
$ThSi_2$	6-I	-	523-524	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium sulfides																
ThS	5	714	714	-	-	-	-	-	-	-	718	-	-	-	-	-
ThS_2	5	714	714	-	-	-	-	716	-	-	-	-	-	-	-	-
Th_2S_3	5	-	714	-	-	-	-	-	-	-	-	-	-	-	-	-
Th_4S_7	5	714	714	-	-	-	-	-	-	-	-	-	-	-	-	-
Th_7S_{12}	5	-	714	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorium uranium beryllide [$(Th_9U)Be_{13}$]	6-I	-	-	-	-	-	-	-	-	-	136	-	-	-	-	-
Thorium uranium boride [$(Th_9U)B_4$]	6-I	-	-	-	-	-	-	-	-	-	234	-	-	-	-	-
Thorium uranium carbides																
$(Th_9U)C$	5	-	-	-	-	-	-	-	-	-	174	-	-	-	-	-
$(Th_9U)C_2$	5	-	-	-	-	-	-	-	-	-	174	-	-	-	-	-
Thulia	4-I	-	-	-	-	-	-	-	-	-	439	-	-	-	-	-
Thulium (Tm)	1	985	985	985	985	985	987	989	-	-	-	-	-	-	-	991
Thulium (hexa-) boride (TmB_6)	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thulium carbide (TmC_2)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thulium oxide (Tm_2O_3)	4-I	-	-	-	-	-	-	-	-	-	439	-	-	-	-	-
Tin + Magnesium	2-I	-	-	-	-	-	493	-	-	-	-	-	-	-	-	-
Tin(ic) aluminate ($2SnO_2 \cdot 3Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1031	-	-	-	-	-
Tin(ic) oxide (SnO_2)	4-I	-	-	-	-	-	-	-	441	-	443	-	-	-	-	-
Tin(ic) oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	840	-	-	-	-	-	-	-
Tin(ic) oxide + Magnesium oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	842	-	-	-	-	-	-	-
Tin(ic) oxide + Vanadium (pent-) oxide	4-I	-	-	-	-	-	-	-	-	-	844	-	-	-	-	-
Tin(ic) oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	846	-	-	-	-	-	-	-
Tin(ic) oxide + Zinc oxide + + Magnesium oxide	4-I	-	-	-	-	-	-	-	848	-	-	-	-	-	-	-
Tin(ous) (ortho-) phosphate ($3\ SnO \cdot P_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1179	-	-	-	-	-
Tin sulfide (SnS)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin telluride (SnTe)	6-I	-	-	-	-	-	632	-	-	-	-	-	-	720	-	-
Tin telluride + Silver antimony telluride	6-I	-	-	-	-	-	-	-	721	-	-	-	-	-	-	-
Tin-zirconium intermetallics																
$SnZr_2$	6-I	-	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Sn_3Zr_5	6-I	-	694	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanium (Ti)	1	993	993	–	–	993	996	999	1001	1003	1005	–	1007-1013	1015	–	1017
Titanium coated with aluminide .	6-II	–	–	–	–	–	–	–	–	–	–	–	1447-1449	1451	–	–
Titanium coated with aluminized-silicone paint	6-II	–	–	–	–	–	–	–	–	–	–	–	–	1497	–	–
Titanium coated with gold . . .	6-II	–	–	–	–	–	–	–	–	–	–	–	1303	1305	–	–
Titanium coated with silicides .	6-II	–	–	–	–	–	–	–	–	–	–	–	1479-1481	1483	–	–
Titanium A-55	1	–	–	–	–	–	996	–	–	–	1005	–	–	–	–	–
Titanium A-70	1	–	–	–	–	–	–	–	–	–	1005	–	–	–	–	–
Titanium Ti-75A	1	–	–	–	–	–	996	999	1001	–	1005	–	1007-1009	1015	–	–
Titanium Ti-75A (AMS 4901) coated with Dow-Corning XP-310	6-II	–	–	–	–	–	–	–	–	–	–	–	–	1497	–	–
Titanium RC-55	1	–	–	–	–	–	996	–	–	–	–	–	–	–	–	–
Titanium VT-1	1	–	–	–	–	–	–	–	–	1003	–	–	–	–	–	–
Titanium + ΣX_i	2-II	1502	–	–	–	–	1504	1506	–	–	1508	–	–	–	–	–
Titanium + Aluminum	2-I	–	–	–	–	–	495-501	–	503	505	–	–	–	–	–	–
Titanium + Aluminum + ΣX_i . .	2-II	–	–	–	–	–	1426-1432	1434	1436-1442	1444-1446	1448-1454	–	1456-1459	1461	–	–
Titanium + Chromium	2-I	–	–	–	–	–	–	–	–	–	507	–	–	–	–	–
Titanium + Chromium + ΣX_i . .	2-II	–	–	–	–	–	–	1464	1466	–	1468	–	–	–	–	–
Titanium + Copper	2-I	–	–	–	–	–	509	–	–	–	511	–	–	–	–	–
Titanium + Germanium	2-I	–	–	–	–	–	513	–	–	–	515	–	–	–	–	–
Titanium + Iron	2-I	–	–	–	–	–	–	–	–	–	517	–	–	–	–	–
Titanium + Iron + ΣX_i	2-II	1470	–	–	–	–	1472	–	1474	–	1476	–	–	–	–	–
Titanium + Manganese	2-I	519	–	–	–	–	521	523	525	527	529	–	531-535	537	–	–
Titanium + Manganese + ΣX_i . .	2-II	–	–	–	–	–	1478	–	–	–	1480	–	–	–	–	–
Titanium + Molybdenum	2-I	–	–	–	–	–	–	–	–	–	539	–	–	–	–	–
Titanium + Molybdenum + ΣX_i .	2-II	–	–	–	–	–	1482	–	–	–	–	–	–	–	–	–
Titanium + Nickel	2-I	–	–	–	–	–	–	–	–	–	541	–	–	–	–	–
Titanium + Niobium	2-I	–	–	–	–	–	543	–	–	–	545	–	–	–	–	–
Titanium + Silicon	2-I	–	–	–	–	–	–	–	–	–	547	–	–	–	–	–
Titanium + Tantalum	2-I	549	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium + Tin	2-I	–	–	–	–	–	551	–	553	–	–	–	–	–	–	–
Titanium + Tin + ΣX_i	2-II	–	–	–	–	–	1404	–	1486	–	–	–	–	–	–	–
Titanium + Tungsten	2-I	555	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium + Vanadium	2-I	557	–	–	–	–	–	–	–	–	559	–	–	–	–	–
Titanium + Vanadium + ΣX_i . . .	2-II	1438	–	–	–	–	–	1490	1492	–	1494	–	–	1496	–	–
Titanium + Zirconium	2-I	–	–	–	–	–	561	–	–	–	563	–	–	–	–	–
Titanium + Zirconium + ΣX_i . .	2-II	–	–	–	–	–	1498	–	1500	–	–	–	–	–	–	–

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Titanium alloys (special designations)																
2.5 Al - 16 V	2-II	-	-	-	-	-	-	1490	-	-	-	-	-	-	-	-
3 Al - 2.5 V	2-II	-	-	-	-	-	-	-	-	-	1454	-	-	-	-	-
4 Al - 3 Mo	2-II	-	-	-	-	-	-	-	-	-	1452	-	-	-	-	-
4 Al - 3 Mo - 1 V	2-II	-	-	-	-	-	-	1434	-	-	-	-	-	-	-	-
4 Al - 4 Mn	2-II	-	-	-	-	-	-	-	-	-	1450, 1481	-	-	-	-	-
6 Al - 4 V	2-II	-	-	-	-	-	1428	1434	1440	1444	1454	-	1456-1459	-	-	-
7 Al - 4 Mo	2-II	-	-	-	-	-	-	-	-	-	1452	-	-	-	-	-
7 Al - 2 Nb - 1 Ta	2-II	-	-	-	-	-	-	-	-	-	1448	-	-	-	-	-
13 V - 11 Cr - 3 Al	2-II	-	-	-	-	-	-	1490	-	-	-	-	-	-	-	-
48 - OT - 3	2-I	-	-	-	-	-	-	-	-	505	-	-	-	-	-	-
A - 110 AT	2-II	-	-	-	-	-	1432	-	1438	-	1448	-	1456-1459	1461	-	-
B120VCA (crucible heat no. R6759 sheet no. 9MB3)	2-II	-	-	-	-	-	-	-	1492	-	1494	-	-	1496	-	-
BT-5	2-I	-	-	-	-	-	-	-	-	505	-	-	-	-	-	-
C-110M	2-I	-	-	-	-	-	521	523	525	527	529	-	533-535	537	-	-
C-120AV	2-II	-	-	-	-	-	-	-	-	-	1454	-	-	-	-	-
C-130AM	2-II	-	-	-	-	-	1426, 1478	-	1442	-	-	-	-	-	-	-
Cr - Mo	2-II	-	-	-	-	-	-	-	1466	-	-	-	-	-	-	-
Heat no. 32167 and sheet no. 1777A-1	2-II	-	-	-	-	-	-	-	-	-	1454	-	-	-	-	-
Heat no. R6736 sheet no. B-32	2-II	-	-	-	-	-	-	-	1436	-	1452	-	-	-	-	-
Heat no. 23345 sheet no. 1149-3	2-II	-	-	-	-	-	-	-	1492	-	1494	-	-	-	-	-
Hylite 20	2-II	-	-	-	-	-	1432	-	1438	-	-	-	-	-	-	-
Hylite 30	2-II	-	-	-	-	-	1426, 1478	-	1442	-	-	-	-	-	-	-
Hylite 40	2-II	-	-	-	-	-	1426, 1478	-	1442	-	-	-	-	-	-	-
Hylite 50	2-II	-	-	-	-	-	1432, 1482	-	1436	-	-	-	-	-	-	-
Hylite 55	2-II	-	-	-	-	-	1484	-	1486	-	-	-	-	-	-	-
Hylite 60	2-II	-	-	-	-	-	1484	-	1486	-	-	-	-	-	-	-
MST-3Mn	2-II	-	-	-	-	-	-	-	-	-	1481	-	-	-	-	-
RC-130A	2-I	-	-	-	-	-	521	523	525	527	529	-	533-535	537	-	-
RC-130B	2-II	-	-	-	-	-	1426, 1478	-	-	-	1450	-	-	-	-	-
RMI-8Mn	2-II	-	-	-	-	-	-	-	-	-	1481	-	-	-	-	-
RMI-30	2-I	-	-	-	-	-	-	-	-	-	517	-	-	-	-	-
RMI-40	2-I	-	-	-	-	-	-	-	-	-	517	-	-	-	-	-

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Titanium alloys (special designations) (cont.)																
RMI-55	2-I	–	–	–	–	–	–	–	–	–	517	–	–	–	–	–
RMI-70	2-I	–	–	–	–	–	–	–	–	–	517	–	–	–	–	–
RS-120	2-I	–	–	–	–	–	–	–	–	–	–	–	531	–	–	–
Ti-140A	2-II	–	–	–	–	–	1472	–	1474	–	–	–	–	–	–	–
Ti-150A	2-II	–	–	–	–	–	–	–	1466	–	–	–	–	–	–	–
Ti-155A	2-II	–	–	–	–	–	1432	–	1442	–	–	–	–	–	–	–
Titanium alloy 8 Al-4 V coated with Rokide C	6-II	–	–	–	–	–	–	–	–	–	–	–	1345-1347	–	–	–
Titanium aluminide (TiAl)	6-I	27	27	–	–	–	–	–	–	–	–	–	29-31	33	–	–
Titanium aluminide + Aluminum oxide	5	–	–	–	–	–	–	–	–	–	–	–	862-864	866	–	–
Titanium beryllides																
TiBe	6-I	138	–	–	–	–	–	–	–	–	–	–	–	–	–	–
$TiBe_2$	6-I	138	–	–	–	–	–	–	–	–	–	–	–	–	–	–
$TiBe_{12}$	6-I	–	–	–	–	–	–	140	142	–	–	–	–	–	–	–
Titanium borides																
TiB	6-I	236	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TiB_2	6-I	236	236	–	–	–	238	240	242	–	244	–	246-248	–	–	–
Ti_2B	6-I	–	236	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium (di-)boride + + Aluminum boride	6-I	723	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium (di-)boride + + Boracic acid	5	–	–	–	–	–	–	–	–	–	–	–	886-888	890	–	–
Titanium (di-)boride + + Chromium (di-)boride	6-I	723	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium (di-)boride + + (Penta-)niobium (tri-)-silicide	6-I	–	724	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium (di-)boride + + Tantalum (di-)silicide	6-I	–	724	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium (di-)boride + + Titanium (di-)oxide	5	–	–	–	–	–	–	–	–	–	–	–	892-894	896	–	–
Titanium (di-)boride + + Titanium (di-)oxide + + Boracic acid	5	–	–	–	–	–	–	–	–	–	–	–	898-900	902	–	–
Titanium (di-)boride + + Titanium nitride	5	–	–	–	–	–	–	–	–	–	801	–	–	–	–	–
Titanium (di-)boride + + Vanadium (di-)boride	6-I	723	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium carbide (TiC)	5	176	176	–	–	–	178	180	182	185	187	–	189-193	–	–	–

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Titanium carbide + Cobalt cermet	6-II	862	-	-	-	-	-	-	911	-	864	-	-	-	-	-
Titanium carbide + Molybdenum + + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	866	-	-	-	-	-
Titanium carbide + Nickel cermet	6-II	868	-	-	-	-	-	871	873	-	875-877	-	-	-	-	-
Titanium carbide + Niobium carbide + Nickel cermet	6-II	-	-	-	-	-	-	-	911	-	-	-	-	-	-	-
Titanium carbide + Tungsten cermet	6-II	-	-	-	-	-	-	-	-	-	879	-	-	-	-	-
Titanium-chromium intermetallics ($TiCr_2$)	6-I	-	-	-	-	-	-	-	-	-	-	-	656-658	660	-	-
Titanium-chromium intermetallics + Chromium (sesqui-)oxide	5	-	-	-	-	-	-	-	-	-	926	-	928-930	932	-	-
Titanium-chromium intermetallics + Chromium (sesqui-)oxide + Titanium (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	934-936	938	-	-
Titanium-chromium intermetallics + Titanium (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	940-942	944	-	-
Titanium ferrides																
TiFe	6-I	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
$TiFe_2$	6-I	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium-gold intermetallics																
TiAu	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
$TiAu_2$	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Ti_3Au	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium hydride (TiH)	5	-	-	-	-	-	443	445	-	-	-	-	-	-	-	-
Titanium iodide (TiI_2)	5	-	-	-	-	-	-	-	-	-	475	-	-	-	-	-
Titanium nitride (TiN)	5	571	571	-	-	-	573	575	577	579	581	-	584	-	-	-
Titanium nitride + Chromium + + Titanium cermet	6-II	-	-	-	-	-	-	-	-	-	909	-	-	-	-	-
Titanium nitride + Titanium (di-)boride	5	-	-	-	-	-	-	-	-	-	842	-	-	-	-	-
Titanium oxides																
TiO	4-I	-	-	-	-	446	-	452	-	-	462	-	-	-	-	479
TiO_2	4-I	445	445	-	-	446	450	454	460	-	462	465	467-471	473-475	477	479
Ti_2O_3	4-I	-	-	-	-	-	-	456	-	-	-	-	-	-	-	-
Ti_3O_5	4-I	-	-	-	-	-	-	458	-	-	-	-	-	-	-	479
Titanium (mon-)oxide + + Chromium-titanium alloys cermet	6-II	-	-	-	-	-	-	-	-	-	796	-	-	-	-	-

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Titanium (di-) oxide and aluminum oxide coating on molybdenum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (di-) oxide + Antimony (tri-) oxide	4-I	-	-	-	-	-	-	-	-	-	1395	-	-	-	-	-
Titanium (di-) oxide + Beryllium oxide + Calcium titanium silicate + Magnesium oxide	4-II	-	-	-	-	-	-	-	-	-	850	-	-	-	-	-
Titanium (di-) oxide + Lithium carbonate	4-II	-	-	-	-	-	-	-	-	-	1550	-	-	-	-	-
Titanium (di-) oxide + Manganese (di-) oxide	4-I	-	-	-	-	-	-	-	-	-	1552	-	-	-	-	-
Titanium (di-) oxide + Niobium (pent-) oxide	4-I	-	854	-	-	-	-	-	-	-	852	-	-	-	-	-
Titanium (di-) oxide + Silicon (di-) oxide	4-I	-	-	-	-	-	-	-	-	-	856	-	-	-	-	-
Titanium (di-) oxide + Strontium oxide	4-I	-	862	-	-	-	858	-	-	-	860	-	-	-	-	-
Titanium (di-) oxide + Tin(ic) oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (di-) oxide + Titanium (di-) boride	5	-	-	-	-	-	-	-	-	-	864	-	-	-	-	-
Titanium (di-) oxide + Tungsten (tri-) oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	791-793	795	-	-
Titanium (di-) oxide + Vanadium (pent-) oxide	4-I	-	-	-	-	-	-	-	-	-	866	-	-	-	-	-
Titanium (di-) oxide + Zirconium (di-) oxide	4-I	-	-	-	-	-	-	-	-	-	868-870	-	-	-	-	-
Titanium phosphates																
$TiO_2 \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	872	-	-	-	-	-
$5\ TiO_2 \cdot 2\ P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1181	-	-	-	-	-
Titanium phosphide (TiP)	5	635	636	-	-	-	639	-	-	-	1181	-	-	-	-	-
Titanium silicides											-	-	-	-	-	-
TiSi	6-I	-	479	-	-	-	-	481	-	-	483	-	-	-	-	-
$TiSi_2$	6-I	479	479	-	-	-	-	481	-	-	483	-	485-487	489	-	-
Ti_5Si_3	6-I	-	479	-	-	-	-	481	-	-	483	-	-	489	-	-
Titanium (di-) silicide + + (Penta-) titanium (tri-) - silicide	6-I	-	-	-	-	-	-	-	-	-	-	-	693-695	697	-	-
(Penta-) titanium (tri-) silicide + + Titanium (di-) silicide	6-I	-	-	-	-	-	-	-	-	-	-	-	699-701	703	-	-
Titanium tungsten (di-) carbide + + Cobalt cermet	6-II	-	-	-	-	-	-	-	-	-	881	-	-	-	-	-
Titanium tungsten (di-) carbide + + Tantalum cermet	6-II	-	-	-	-	-	-	-	-	-	883	-	-	-	-	-

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Titanox TG	4-I	-	-	-	-	-	-	-	-	-	462	-	-	-	-	-
Transite	6-II	-	-	-	-	-	-	1216	-	-	-	-	-	-	-	-
Tremolite	4-II	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	-
Trolitul Luv-M150	6-II	-	-	-	-	-	-	970	972	1082	-	-	-	-	-	-
Tungsten (W)	1	1019	1019	-	-	-	1021	1023	1025	1027	1029	-	1031-1038	1040-1042	-	1044
Tungsten, lamp grade	1	-	-	-	-	-	-	-	-	-	-	-	1038	-	-	-
Tungsten coated with hafnium (di-) oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	1377-1379	-	-	-
Tungsten coated with silicide	6-II	-	-	-	-	-	-	-	-	-	-	-	1485-1487	1489	-	-
Tungsten coating on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1329	1331	-	-
Tungsten coating on iron	6-II	-	-	-	-	-	-	-	-	-	-	1325	1327	-	-	-
Tungsten + ΣX_i	2-II	1516	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten + Cobalt	2-I	-	-	-	-	-	-	-	-	-	565	-	-	-	-	-
Tungsten + Copper	2-I	-	-	-	-	-	-	-	-	-	567	-	-	-	-	-
Tungsten + Molybdenum	2-I	-	-	-	-	-	-	-	-	-	-	-	569-573	-	-	-
Tungsten + Nickel + ΣX_i	2-II	1510	-	-	-	-	-	-	1512	-	1514	-	-	-	-	-
Tungsten + Niobium	2-I	-	575	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten + Rhenium	2-I	-	-	-	-	-	577	-	-	-	-	-	-	-	-	-
Tungsten alloys (special design.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B50YA12B	2-II	-	-	-	-	-	-	-	-	-	1514	-	-	-	-	-
Heavy alloy	2-II	-	-	-	-	-	-	-	-	-	1514	-	-	-	-	-
Mallory 1000	2-II	-	-	-	-	-	-	-	-	-	1514	-	-	-	-	-
Tungsten aluminide (WAl)	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten arsenide (W_3As_7)	6-I	-	-	-	-	-	96	-	-	-	-	-	-	-	-	-
Tungsten borides																
WB	6-I	-	250	-	-	-	252	254	258	260	262	-	264	-	-	-
WB_2	6-I	-	250	-	-	-	-	-	-	-	-	-	-	-	-	-
W_2B	6-I	-	250	-	-	-	-	256	-	-	-	-	-	-	-	-
W_2B_5	6-I	-	250	-	-	-	-	256	-	-	-	-	-	-	-	-
Tungsten carbides																
WC	5	195	195	-	-	-	197	199	201	-	203	-	205-209	-	-	215
W_2C	5	-	195	-	-	-	-	-	-	-	203	-	211-213	-	-	-
Tungsten carbide coating on iron	6-II	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-
Tungsten carbide + Chromium-cobalt alloys cermet	6-II	-	-	-	-	-	-	-	-	-	895	-	-	-	-	-
Tungsten carbide + Cobalt cermet	6-II	-	-	-	-	-	-	-	889	-	897-905	-	-	-	-	-

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Tungsten carbide + Nickel cermet	6-II	-	-	-	-	-	-	-	-	-	907	-	-	-	-	-
Tungsten-cobalt alloy coating on Inconel X	6-II	-	-	-	-	-	-	-	-	-	-	-	1341	1343	-	-
Tungsten-cobalt intermetallics (WCo_2)	6-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten iron lead oxide ($3\ PbO \cdot Fe_2O_3 \cdot WO_3$)	4-II	-	-	-	-	-	-	-	-	-	1159	-	-	-	-	-
Tungsten nitride (WN)	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten oxides																
WO_2	4-I	-	-	-	-	-	-	-	-	-	485	-	-	-	-	-
WO_3	4-I	-	-	-	-	-	-	481	483	-	485	-	-	-	-	-
$W_{18}O_{49}$	4-I	-	-	-	-	-	-	-	-	-	485	-	-	-	-	-
$W_{20}O_{58}$	4-I	-	-	-	-	-	-	-	-	-	485	-	-	-	-	-
Tungsten (tri-)oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	874	-	-	-	-	-	-	-
Tungsten phosphide (WP)	5	635	636	-	-	-	639	-	-	-	-	-	-	-	-	-
Tungsten selenide (WSe_2)	6-I	-	-	-	-	-	359	-	361	-	-	-	-	-	-	-
Tungsten selenide tellurides ($WSe_{2-x}Te_x$)	6-I	-	-	-	-	-	634	-	-	-	-	-	-	-	-	-
Tungsten silicides																
WSi	6-I	-	491	-	-	-	-	-	-	-	-	-	-	-	-	-
WSi_2	6-I	-	491	-	-	-	-	493	495	-	497	-	-	499	-	-
W_5Si_2	6-I	-	491	-	-	-	-	-	-	-	-	-	-	-	-	-
W_5Si_3	6-I	-	491	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten tellurides (WTe_2)	6-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten-zirconium intermetallics (W_2Zr)	6-I	-	684	-	-	-	638	-	640	-	-	-	-	-	-	-
U																
Udimet 500	2-II	-	-	-	-	-	-	-	1134	-	-	-	1201, 1233	1213, 1235	-	-
Udimet 600	2-II	-	-	-	-	-	-	-	1134	-	-	-	-	-	-	-
Uranium (U)	1	1046	1046	-	-	-	1049	1051	1053	1056	1058	-	1061-1063	-	-	-
Uranium + ΣX_i	2-II	-	-	1544	1544	1544	-	-	-	-	-	-	-	-	-	1546
Uranium + Chromium	2-I	579	579	-	-	-	581	583	585	-	587	-	-	-	-	-
Uranium + Iron	2-I	589	..	-	-	-	-	-	-	-	591	-	-	-	-	-
Uranium + Magnesium	2-I	-	-	-	-	-	-	-	593	-	595	-	-	-	-	-
Uranium + Molybdenum	2-I	599	597	-	-	-	601	603	605	-	607-613	-	-	-	-	-
Uranium + Molybdenum + ΣX_i	2-II	-	1518	-	-	-	-	-	1520	-	1522-1526	-	-	-	-	-
Uranium + Niobium	2-I	-	617	-	-	-	-	-	619	-	-	-	621-623	-	-	-
Uranium + Plutonium + ΣX_i	2-II	-	1528	-	-	-	-	-	-	-	1530	-	-	-	-	-

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Uranium + Thorium + ΣX_i . . .	2-II	-	1532	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium + Zirconium	2-I	625	-	-	-	-	627	-	629	-	631-641	-	-	-	-	-
Uranium + Zirconium + ΣX_i . .	2-II	-	1534	-	-	-	1536	-	1538	-	-	-	1540-1542	-	-	-
Uranium alloys (special design.)																
Fissium alloy	2-II	-	1518	-	-	-	-	-	1520	-	-	-	-	-	-	-
U-3% FS	2-II	-	-	-	-	-	-	-	1520	-	-	-	-	-	-	-
U-5% FS	2-II	-	-	-	-	-	-	-	1520	-	-	-	-	-	-	-
U-5% FS - 2.25 Zr	2-II	-	-	-	-	-	-	-	1538	-	-	-	-	-	-	-
U-8% FS	2-II	-	-	-	-	-	-	-	1520	-	-	-	-	-	-	-
U-10% FS	2-II	-	-	-	-	-	-	-	1520	-	-	-	-	-	-	-
Uranium aluminides																
UAl_2	6-I	35	35	-	-	-	-	-	-	-	37	-	-	-	-	-
UAl_3	6-I	35	35	-	-	-	-	-	-	-	-	-	-	-	-	-
UAl_4	6-I	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium beryllide (UBe_{13}) . .	6-I	144	-	-	-	-	-	-	146	-	-	-	-	-	-	-
Uranium-bismuth intermetallics																
UBi	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
UBi_2	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
U_3Bi_4	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
U_4Bi_5	6-I	676	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium borides																
UB_2	6-I	-	266	-	-	-	-	-	-	-	268	-	-	-	-	-
UB_4	6-I	266	266	-	-	-	-	-	-	-	-	-	-	-	-	-
UB_{12}	6-I	-	266	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium bromide (UBr_3)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium carbides																
UC	5	217	217	-	-	-	219	223	231	235	237	-	243, 245	-	-	-
UC_2	5	-	217	-	-	-	221	225-227	233	-	239	-	243-245	-	-	-
U_2C_3	5	217	217	-	-	-	-	229	-	-	241	-	-	-	-	-
Uranium (mono-) carbide + + Molybdenum cermet	6-II	-	-	-	-	-	-	-	-	-	891	-	-	-	-	-
Uranium (mono-) carbide + + Uranium cermet	6-II	-	-	-	-	-	-	-	-	-	893	-	-	-	-	-
Uranium (di-) carbide + Graphite	5	-	-	-	-	-	-	-	743	-	-	-	-	-	-	-
Uranium chlorides																
UCl_3	5	335	-	-	-	-	-	337	-	-	-	-	-	-	-	-
UCl_4	5	335	-	-	-	-	-	337	-	-	-	-	-	-	-	-
Uranium-cobalt intermetallics																
UCo	6-I	676	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U_6Co	6-I	676	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Uranium ferrides																
UFe_2	6-I	306	306	-	-	-	-	-	-	-	-	-	-	-	-	-
U_6Fe	6-I	306	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium fluorides																
UF_3	5	-	407	-	-	-	-	-	-	-	-	-	-	-	-	-
UF_4	5	407	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium hydride (UH_3)	5	447	-	-	-	-	-	449	-	-	-	-	-	-	-	-
Uranium iodides																
UI_3	5	-	477	-	-	-	-	-	-	-	-	-	-	-	-	-
UI_4	5	-	477	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium-lead intermetallics																
UPb	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
UPb_3	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium-manganese intermetallics																
UMn_2	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
U_6Mn	6-I	676	676	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium-nickel intermetallics (U_6Ni)	6-I	676	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium nitrides																
UN	5	586	586	-	-	-	-	-	588	590	592	-	-	-	-	-
$UN_{1.56-1.65}$	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	594
UN_2	5	586	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U_2N_3	5	586	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium oxides																
UO_2	4-I	488	489	-	-	-	493	495	503-511	515	517	-	520	-	-	522
$UO_{2.03-2.18}$	4-I	-	-	-	-	-	-	-	508	-	517	-	-	-	-	-
UO_3	4-I	488	489	-	-	-	-	497	-	-	-	-	-	-	-	-
U_2O_3	4-I	-	-	-	-	-	493	-	-	-	-	-	-	-	-	-
U_2O_5	4-I	488	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U_3O_8	4-I	488	489	-	-	-	-	499	513	-	-	-	-	-	-	-
U_4O_9	4-I	-	-	-	-	-	-	501	-	-	-	-	-	-	-	-
Uranium (di-) oxide powder	4-I	-	-	-	-	-	-	-	511	-	-	-	520	-	-	-
Uranium (di-) oxide + Beryllium oxide	4-I	-	-	-	-	-	-	-	876	-	878	-	-	-	-	-
Uranium (di-) oxide + Chromium cermet	6-II	-	-	-	-	-	798	-	800	-	802	-	-	-	-	-
Uranium (di-) oxide + + Dysprosium oxide	4-I	-	-	-	-	-	-	-	-	-	880	-	-	-	-	-
Uranium (di-) oxide + Graphite	5	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
Uranium (di-) oxide + + Magnesium oxide	4-I	-	-	-	-	-	-	-	-	-	882	-	-	-	-	-
Uranium (di-) oxide + + Molybdenum cermet	6-II	-	-	-	-	-	804	-	806	-	808	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Uranium (di-) oxide + Niobium cermet	6-II	-	-	-	-	-	810	-	812	-	-	-	-	-	-	-
Uranium (di-) oxide + Stainless steel cermet	6-II	-	-	-	-	-	814	-	816	-	818	-	-	-	-	-
Uranium (di-) oxide + Thorium (di-) oxide	4-I	-	-	-	-	-	884	-	-	-	-	-	-	-	-	-
Uranium (di-) oxide + Thorium (di-) oxide + Yttrium oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	886
Uranium (di-) oxide + Yttrium oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	888
Uranium (di-) oxide + + Zirconium cermet	6-II	820	-	-	-	-	-	-	822	-	824	-	-	-	-	-
Uranium (di-) oxide + + Zirconium (di-) oxide	4-I	-	890	-	-	-	-	-	-	-	892	-	-	-	-	-
Uranium phosphate ($UO_2 \cdot P_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1183	-	-	-	-	-
Uranium plutonium carbide ($U_{1-x}Pu_xC$)	5	-	-	-	-	-	247	-	-	-	-	-	-	-	-	-
Uranium silicides																
USi	6-I	501	501	-	-	-	-	-	-	-	509	-	-	-	-	-
USi_2	6-I	501	501	-	-	-	-	505	-	-	509	-	-	-	-	-
USi_3	6-I	501	501	-	-	-	503	505	-	-	509	-	-	-	-	-
U_3Si	6-I	501	501	-	-	-	503	505	507	-	509	-	-	-	-	-
U_3Si_2	6-I	501	501	-	-	-	-	-	-	-	509	-	-	-	-	-
Uranium stannide (USn_3)	6-I	541	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium sulfides																
US	5	722	722	-	-	-	-	-	-	-	724	-	-	-	-	-
US_2	5	722	722	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium thorium oxide ($Th_{1-x}U_xO_2$)	4-II	-	-	-	-	-	-	-	1161	-	-	-	-	-	-	-
Uranium-titanium intermetallics (U_2Ti)	6-I	-	676	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium zirconium carbide ($U_{1-x}Zr_xC$)	5	-	-	-	-	-	-	-	-	-	-	-	249	-	-	-
Uranium zirconium hydride ($U_{1-x}Zr_xH$)	5	-	-	-	-	-	-	-	-	-	451	-	-	-	-	-
Uranyl oxide	4-I	488	489	-	-	-	-	497	-	-	-	-	-	-	-	-
Urea formaldehyde, alpha cellulose filled	6-II	-	-	-	-	-	-	-	-	-	1002	-	-	-	-	-
V																
Vanadate glass	4-II	-	-	-	-	-	1645	-	-	-	1647	-	-	-	-	-
Vanadium (V)	1	1065	1065	-	-	1065	1067	1069	1071	-	1073	-	1075	1077	-	1079
Vanadium + ΣX_i	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Aluminum	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Antimony	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Chromium	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Vanadium + Copper	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Iron	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Manganese	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Nickel	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Palladium	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Silicon	2-I	-	-	-	-	-	-	-	-	-	645	-	-	-	-	-
Vanadium + Silicon + ΣX_i	2-II	-	-	-	-	-	-	-	1548	-	-	-	-	-	-	-
Vanadium + Tin	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium + Titanium	2-I	647	-	-	-	-	643	-	649	-	651	-	-	-	-	-
Vanadium + Titanium + ΣX_i	2-II	-	-	-	-	-	-	-	1550	-	-	-	-	-	-	-
Vanadium + Zirconium	2-I	-	-	-	-	-	643	-	-	-	-	-	-	-	-	-
Vanadium aluminide (V_5Al_3)	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium beryllide (VBe_{13})	6-I	-	158	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium borides																
VB	6-I	-	270	-	-	-	-	-	-	-	-	-	-	-	-	-
VB_2	6-I	270	270	-	-	-	-	-	-	-	272	-	-	-	-	-
V_3B_2	6-I	-	270	-	-	-	-	-	-	-	-	-	-	-	-	-
V_3B_4	6-I	-	270	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (di-)boride + + Chromium (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (di-)boride + + Titanium (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium carbides																
VC	5	251	251	-	-	-	253	255	257	-	259	-	261	-	-	-
V_2C	5	-	251	-	-	-	-	-	-	-	259	-	-	-	-	-
Vanadium germanium lead oxide ($5\ PbO \cdot GeO_2 \cdot V_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1163	-	-	-	-	-
Vanadium hydride (VH)	5	-	-	-	-	-	-	453	-	-	-	-	-	-	-	-
Vanadium-manganese intermetallics (VMn_2)	6-I	-	685	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium nitride (VN)	5	596	596	-	-	-	-	598	-	-	600	-	-	-	-	-
Vanadium oxides																
VO	4-I	-	-	-	-	524	-	528	-	-	-	-	-	-	-	536
V_2O_3	4-I	-	-	-	-	-	526	530	-	-	-	-	-	-	-	-
V_2O_4	4-I	-	-	-	-	-	-	532	-	-	-	-	-	-	-	-
V_2O_5	4-I	524	524	-	-	-	526	534	-	-	-	-	-	-	-	-
Vanadium (pent-)oxide + + Titanium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	894	-	-	-	-	-
Vanadium phosphide (VP)	5	635	636	-	-	-	639	-	-	-	-	-	-	-	-	-
Vanadium silicides																
VSi	6-I	-	511	-	-	-	-	-	-	-	-	-	-	-	-	-
VSi_2	6-I	-	-	-	-	-	-	513	-	-	515	-	-	-	-	-
V_3Si	6-I	-	511	-	-	-	-	513	-	-	515	-	-	-	-	-
V_5Si_3	6-I	-	511	-	-	-	-	513	-	-	515	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Vanadium silicon lead oxide ($5\ PbO \cdot SiO_2 \cdot V_2O_5$)	4-II	-	-	-	-	-	-	-	-	-	1165	-	-	-	-	-
Vanadium-zirconium intermetallics (V_2Zr)	6-I	-	685	-	-	-	-	-	-	-	-	-	-	-	-	-
Vermiculite, expanded	4-I	-	-	-	-	-	-	-	814	-	-	-	-	-	-	-
Vinylite VMCH	6-II	-	-	-	-	-	-	-	-	-	950	-	-	-	-	-
Vinylite VYDR	6-II	-	-	-	-	-	-	-	-	-	950	-	-	-	-	-
Vitreous bonded aluminum titanate	5	-	-	-	-	-	949-953	-	-	-	955-977	-	-	-	-	-
Vulcollan	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vycor no. 790	4-II	-	1651	-	-	-	1653	-	-	-	1663	-	-	-	-	-
Vycor 7900	4-II	-	-	-	-	-	-	1655	-	1661	-	-	1665	1669	1671-1673	-
Vycor glasses	4-II	1651	1651	-	-	-	1653	1655	1657, 1699	1659-1661	1663	-	1665-1667	1669	1671-1673	-
W																
Willemite	4-II	-	-	-	-	-	-	1340	-	-	-	-	-	-	-	-
Wollastonite	4-II	-	-	-	-	-	-	1229	-	-	-	-	-	-	-	-
Wustite	4-I	-	-	-	-	-	-	-	-	-	222	-	-	-	-	-
Y																
Ytterbia	4-I	538	-	-	-	-	-	540	-	-	542	-	-	-	544	-
Ytterbium (Yb)	1	1081	1081	1081	1081	1081	1083	1085	-	-	-	-	-	-	-	-
Ytterbium + Calcium	2-I	-	-	-	-	-	-	-	-	-	653	-	-	-	-	-
Ytterbium borides																
YbB_4	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YbB_6	6-I	295	-	-	-	-	300	-	-	-	-	-	-	-	-	-
Ytterbium carbide (YbC_2)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ytterbium oxide (Yb_2O_3)	4-I	538	-	-	-	-	-	540	-	-	542	-	-	-	544	-
Ytterbium selenide (YbSe)	6-I	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ytterbium sulfide (Yb_2S_3)	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttria	4-I	546	-	-	-	-	-	548	550	-	552	-	555-559	-	561	-
Yttrium (Y)	1	1087	1087	1087	1087	1087	1089	1091	1093	-	-	-	1095	-	-	1097
Yttrium + ΣX_i	2-II	-	-	-	-	-	-	1554	-	1556	-	-	-	-	-	-
Yttrium + Tantalum	2-I	-	-	-	-	-	-	655	-	-	-	-	-	-	-	-
Yttrium + Terbium	2-I	-	-	-	-	-	657	-	-	-	-	-	-	-	-	-
Yttrium + Terbium + ΣX_i	2-II	1552	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium borides																
YB_2	6-I	295	297	-	-	-	-	-	-	-	-	-	-	-	-	-
YB_4	6-I	295	297	-	-	-	-	-	-	-	-	-	-	-	-	-

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Yttrium borides (cont.)																
YB_6	6-I	295	297	-	-	-	300	-	-	-	-	-	-	-	-	-
Yttrium carbides																
YC	5	-	295	-	-	-	-	-	-	-	-	-	-	-	-	-
YC_2	5	294	295	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_2C_3	5	-	295	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_3C	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-cobalt intermetallics																
YCo_2	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YCo_5	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-copper intermetallics (YCu_5)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium ferride (YFe_5)	6-I	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium fluoride (YF_3)	5	407	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-gallium intermetallics (YGa_2)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium germanides (Y_5Ge_3)	6-I	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium hydrides																
YH_2	5	455	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YH_3	5	455	-	-	-	-	-	457	-	-	-	-	-	-	-	-
Yttrium-manganese intermetallics																
YMn_2	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YMn_5	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-nickel intermetallics (YNi_5)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium nitride (YN)	5	621	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-osmium intermetallics (YOs_2)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium oxide (Y_2O_3)	4-I	546	-	-	-	-	-	548	550	-	552	-	555-559	-	561	-
Yttrium oxide + Chromium (sesqui-) oxide	4-I	-	-	-	-	-	-	-	-	-	-	-	896	-	-	-
Yttrium oxide + Uranium (di-) oxide	4-I	-	-	-	-	-	-	-	898	-	-	-	-	-	-	-
Yttrium-rhodium intermetallics (YRh)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium silicides																
YSi	6-I	523	524	-	-	-	-	-	-	-	-	-	-	-	-	-
YSi_2	6-I	523	524	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_5Si_5	6-I	-	524	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_5Si_3	6-I	523	524	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium-silver intermetallics (YAg)	6-I	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Yttrium sulfides																
YS	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
YS_2	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_2S_3	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Y_3S_7	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Yttrium tellurides (Y_2Te_3)	6-I	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Z																
Zinc + Copper	2-I	-	-	-	-	-	659	-	-	-	-	-	-	-	-	-
Zinc + Silver	2-I	-	661	661	-	-	-	-	-	-	-	-	-	-	-	-
Zinc + Zirconium	2-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	663
Zinc aluminate ($ZnO \cdot Al_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1033	-	-	-	-	-
Zinc antimonide (ZnSb)	6-I	-	-	-	-	-	75	-	77	-	-	-	-	-	-	79
Zinc chromate ($ZnO \cdot Cr_2O_3$)	4-II	-	-	-	-	-	-	-	-	-	1063	-	-	-	-	-
Zinc chromate spinal	4-II	-	-	-	-	-	-	-	-	-	1063	-	-	-	-	-
Zinc ferrite ($ZnO \cdot Fe_2O_3$)	4-II	-	-	-	-	-	1099	1101	1103	-	1105	-	-	-	-	-
Zinc fluoride (ZnF_2)	5	407	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc germanide oxide ($2\ ZnO \cdot GeO_2$)	4-II	-	-	-	-	-	-	-	-	-	1167	-	-	-	-	-
Zinc germanium oxide + + Magnesium germanium oxide.	4-II	-	-	-	-	-	-	-	-	-	1556	-	-	-	-	-
Zinc germanium oxide + Zinc (ortho-) silicate	4-II	-	-	-	-	-	-	-	-	-	1558	-	-	-	-	-
Zinc lead silicate glass	4-II	-	-	-	-	-	1825	-	-	-	-	-	-	-	-	-
Zinc magnesium aluminum borosilicate glass	4-II	-	-	-	-	-	-	-	-	-	1727	-	-	-	-	-
Zinc oxide (ZnO)	4-I	-	-	-	-	-	563	-	565	-	567	-	569	-	-	-
Zinc oxide + Magnesium oxide	4-I	-	-	-	-	-	-	-	900	-	-	-	-	-	-	-
Zinc oxide + Strontium oxide + + Lithium zirconium silicate	4-II	-	-	-	-	-	-	-	1554	-	-	-	-	-	-	-
Zinc oxide + Tin(ic) oxide	4-I	-	-	-	-	-	-	-	902	-	-	-	-	-	-	-
Zinc oxide + Tin(ic) oxide + + Magnesium oxide	4-I	-	-	-	-	-	-	-	904	-	-	-	-	-	-	-
Zinc selenide (ZnSe)	6-I		-	-	-	-	-	-	-	-	363	-	-	-	-	-
Zinc (ortho-) silicate ($2\ ZnO \cdot SiO_2$)	4-II	-	-	-	-	-	-	1340	-	-	1342	-	-	-	-	-
Zinc (ortho-) silicate + + Magnesium (ortho-) silicate	4-II	-	-	-	-	-	-	-	-	-	1575	-	-	-	-	-
Zinc sulfide (ZnS)	5	-	-	-	-	-	726	-	-	-	-	-	-	728-730	-	-
Zinc (ortho-) titanate ($2\ ZnO \cdot TiO_2$)	4-II	-	-	-	-	-	-	1468	-	-	-	-	-	-	-	-
Zircaloy 2	2-I	-	-	-	-	-	699	702	704	-	-	-	709-714	-	-	-
Zircaloy 2, low nickel	2-I	-	-	-	-	-	-	702	-	-	-	-	-	-	-	-

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Zircaloy 4	2-I	-	-	-	-	-	-	702	-	-	-	-	-	-	-	-
Zircon	4-II	1344	-	-	-	-	1346	1348	-	-	-	-	-	-	-	-
Zircon 475	4-II	1344	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zircon CZ-5, Taylor	4-II	-	-	-	-	-	-	1348	1350	-	1352	-	-	-	-	-
Zircon + Beryl	4-II	-	-	-	-	-	-	-	-	-	1577	-	-	-	-	-
Zirconia	4-I	571	571	-	-	571	574	576	578	580	582-587	-	589-593	595	-	597
Zirconium (Zr)	1	1099	1099	-	-	1099	1102	1104	1106	1109	1111	-	1113-1117	-	-	1119
Zirconium no. 715	1	-	-	-	-	-	-	-	1106	-	-	-	-		-	-
Zirconium + ΣX_i	2-II	1580	-	-	-	-	1582	-	1584	-	1586	-	-	-	-	-
Zirconium + Aluminum	2-I	-	-	-	-	-	665	-	667	-	-	-	-	-	-	-
Zirconium + Aluminum + ΣX_i	2-II	1558	-	-	-	-	1560	-	1562	-	-	-	-	-	-	-
Zirconium + Boron	2-I	669	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium + Hafnium	2-I	671	-	-	-	671	673	675	-	-	677	-	-	-	-	-
Zirconium + Hafnium + ΣX_i	2-II	-	-	-	-	-	-	1566	-	-	-	-	-	-	-	-
Zirconium + Indium	2-I	-	-	-	-	-	-	679	-	-	-	-	-	-	-	-
Zirconium + Iron + ΣX_i	2-II	-	-	-	-	-	-	1568	-	-	-	-	-	-	-	-
Zirconium + Molybdenum	2-I	-	-	-	-	-	681	-	683	-	-	-	-	-	-	-
Zirconium + Niobium	2-I	-	-	-	-	-	685	687	689	-	-	-	-	-	-	-
Zirconium + Silver	2-I	-	-	-	-	-	-	691	-	-	-	-	-	-	-	-
Zirconium + Tantalum + ΣX_i	2-II	-	-	-	-	-	1570	-	-	-	-	-	-	-	-	-
Zirconium + Thorium	2-I	-	-	-	-	-	-	-	-	-	693-695	-	-	-	-	-
Zirconium + Tin	2-I	697	-	-	-	-	699	702	704	-	707	-	709-714	-	-	-
Zirconium + Tin + ΣX_i	2-II	-	-	-	-	-	1572	-	-	-	-	-	-	-	-	-
Zirconium + Titanium	2-I	-	-	-	-	-	-	715	-	-	-	-	-	-	-	-
Zirconium + Uranium	2-I	717	-	-	-	-	719	721	723	-	725	-	-	-	-	-
Zirconium + Uranium + ΣX_i	2-II	-	-	-	-	-	-	1574	-	-	-	-	1576-1578	-	-	-
Zirconium alloys (special designations)																
3ZI	2-II	1558	-	-	-	-	1560	-	1562	1564	-	-	-	-	-	-
Zircaloys (see Zircaloy)																
Zirconium aluminides																
$ZrAl_2$	6-I	-	39	-	-	-	-	-	-	-	41	-	-	-	-	-
$ZrAl_3$	6-I	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_2Al_3	6-I	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_3Al_2	6-I	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_5Al_4	6-I	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium beryllides																
$ZrBe_5$	6-I	-	148	-	-	-	-	-	-	-	-	-	-	-	-	-
$ZrBe_9$	6-I	-	148	-	-	-	-	-	-	-	-	-	-	-	-	-

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Zirconium beryllides (cont.)																
$ZrBe_{13}$	6-I	-	148	-	-	-	-	150	152	-	154	-	-	156	-	-
$ZrBe_{16}$	6-I	-	148	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_2Be_{17}	6-I	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-
Zirconium borides																
ZrB	6-I	-	-	-	-	-	-	-	281	-	-	-	-	-	-	-
ZrB_2	6-I	274	274	-	274	-	277	279	-	-	283	-	286-288	291	-	293
ZrB_{12}	6-I	274	274	-	-	-	277	-	281	-	-	-	-	-	-	-
Zirconium (di-)boride cermet	6-II	842	-	-	-	-	844	846	848	-	850	-	-	-	-	-
Zirconium (di-)boride + + Molybdenum (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium (di-)boride + + Molybdenum (di-)silicide	6-I	-	689	-	-	-	-	-	-	-	691	-	-	-	-	-
Zirconium (di-)boride + + Niobium (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium (di-)boride + + Tantalum (di-)boride	6-I	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium carbide (ZrC)	5	263	263	-	-	-	265	267	269	271	273	-	277-283	-	-	285
Zirconium (pyro-)carbide	5	-	-	-	-	-	-	-	-	-	273	-	-	-	-	-
Zirconium carbide + Graphite	5	-	-	-	-	-	-	-	-	-	825	-	-	-	-	-
Zirconium-cobalt intermetallics ($ZrCo_2$)	6-I	-	685	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium ferride ($ZrFe_2$)	6-I	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium fluoride (ZrF_4)	5	407	407	-	-	407	-	-	-	-	-	-	-	-	-	-
Zirconium fluoride + Lithium fluoride	5	-	413	-	-	-	-	-	-	-	-	-	-	-	-	415
Zirconium fluoride + Rubidium fluoride	5	-	417	-	-	-	-	-	-	-	-	-	-	-	-	419
Zirconium fluoride + Sodium fluoride	5	-	421	-	-	-	-	-	-	-	-	-	-	-	-	423
Zirconium germanides																
ZrGe	6-I	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
$ZrGe_2$	6-I	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_5Ge	6-I	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_5Ge_3	6-I	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium hydride (ZrH_2)	5	459	-	-	-	-	-	461	463	-	465	-	-	-	-	-
Zirconium nitride (ZrN)	5	602	602	-	-	-	-	604	606	608	610	-	613-615	-	-	617-619
Zirconium (di-)oxide (ZrO_2)	4-I	571	571	-	-	571	574	576	578	580	582-587	-	589-593	595	-	597
Zirconium (di-)oxide foam	4-I	-	-	-	-	-	-	-	-	-	587	-	-	-	-	-
Zirconium (di-)oxide mix 148	4-I	-	-	-	-	-	-	-	916	-	-	-	-	-	-	-
Zirconium (di-)oxide mix 187	4-I	-	-	-	-	-	-	-	916	-	-	-	-	-	-	-

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Zirconium (di-)oxide Norton mix 302	4-I	-	-	-	-	-	-	-	-	580	-	-	-	-	-	-
Zirconium (di-)oxide ZP-58 . .	5	-	-	-	-	-	-	799	-	-	-	-	-	-	-	-
Zirconium (di-)oxide ZP-74 . .	5	-	-	-	-	-	-	799	-	-	-	-	-	-	-	-
Zirconium (di-)oxide coating on Inconel	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1397	-	-
Zirconium (di-)oxide coating on Inconel X	6 II	-	-	-	-	-	-	-	-	-	-	-	1399	1401	-	-
Zirconium (di-)oxide + ΣX_i . .	5	-	-	-	-	-	-	799	-	-	-	-	-	-	-	-
Zirconium (di-)oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	906	908	-	-	-	-	-
Zirconium (di-)oxide + + Beryllium oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	-	910	-	-	-	-	-
Zirconium (di-)oxide + Calcium oxide	4-I	-	-	-	-	-	912	914	916	918	920	-	923	-	-	-
Zirconium (di-)oxide + Calcium oxide + Cerium (di-)oxide . .	4-I	-	-	-	-	-	-	-	925	-	-	-	-	-	-	-
Zirconium (di-)oxide + Calcium oxide + Silicon (di-)oxide . .	4-I	-	-	-	-	-	-	-	-	-	927	-	-	-	-	-
Zirconium (di-)oxide + Cerium (di-)oxide	4-I	-	-	-	-	-	-	-	-	929	931	-	-	-	-	-
Zirconium (di-)oxide + + Dysprosium oxide	4-I	-	-	-	-	-	-	-	-	-	934	-	-	-	-	-
Zirconium (di-)oxide + Hafnium + + Magnesium	5	-	-	-	-	-	-	797	-	-	-	-	-	-	-	-
Zirconium (di-)oxide + Hafnium (di-)oxide	4-I	-	936	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium (di-)oxide + + Magnesium oxide	4-I	-	-	-	-	-	938	-	940	942	944	-	-	-	-	-
Zirconium (di-)oxide + + Magnesium oxide + Beryllium oxide	4-I	-	947	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium (di-)oxide + Niobium (pent-)oxide	4-I	-	949	-	-	-	-	-	-	-	951	-	-	-	-	-
Zirconium (di-)oxide + + Phosphorus (pent-)oxide . .	4-I	-	-	-	-	-	-	-	-	-	953	-	-	-	-	-
Zirconium (di-)oxide + Silicon (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	955	-	-	-	-	-
Zirconium (di-)oxide + Thorium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	958	-	-	-	-	-
Zirconium (di-)oxide + Titanium cermet	6-II	-	-	-	-	-	-	826	828	830	832	-	-	-	-	-
Zirconium (di-)oxide + Titanium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	960	-	-	-	-	-
Zirconium (di-)oxide + Uranium (di-)oxide	4-I	962	964	-	-	-	-	-	-	-	966	-	-	-	-	-
Zirconium (di-)oxide + Yttrium oxide	4-I	-	-	-	-	-	-	-	968	-	970	-	-	-	-	-
Zirconium (di-)oxide + Yttrium oxide + Cerium (di-)oxide . .	4-I	-	-	-	-	-	-	-	972	-	-	-	-	-	-	-

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Zirconium (di-)oxide + Yttrium oxide + Zirconium cermet. . .	6-II	-	-	-	-	-	-	-	834	-	-	-	-	-	-	-
Zirconium (di-)oxide + + Zirconium cermet	6-II	-	-	-	-	-	-	-	-	836	838	-	-	-	-	840
Zirconium (di-)oxide ZT-15-M cermet	6-II	-	-	-	-	-	-	826	-	830	-	-	-	-	-	-
Zirconium phosphates																
$ZrO_2 \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1185	-	-	-	-	-
$2\ ZrO_2 \cdot P_2O_5$	4-II	-	-	-	-	-	-	-	-	-	1185	-	-	-	-	-
Zirconium (ortho-)silicate ($ZrO_2 \cdot SiO_2$)	4-II	1344	1344	-	-	-	1346	1348	1350	-	1352	-	-	-	-	-
Zirconium (ortho-)silicate + + Beryllium aluminum silicate	4-II	-	-	-	-	-	-	-	-	-	1577	-	-	-	-	-
Zirconium silicides																
ZrSi	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ZrSi_2$	6-I	517	517	-	-	-	-	-	-	-	519	-	-	521	-	-
Zr_2Si	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_3Si_2	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_4Si	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_4Si_3	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_5Si_3	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zr_5Si_4	6-I	517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirconium tantalum carbide ($Ta_XZr_yC_z$)	5	-	-	-	-	-	-	-	-	-	287	-	290	-	-	-
Zirconium titanate ($ZrO_2 \cdot TiO_2$).	4-II	-	-	-	-	-	-	-	-	-	1470	-	-	-	-	-
Zirconium uranium carbide ($Zr_XU_{1-X}C$)	5	-	-	-	-	-	292	-	-	-	-	-	-	-	-	-
Zirconium-vanadium intermetallics (ZrV_2)	6-I	-	685	-	-	-	-	-	-	-	-	-	-	-	-	-
Zirox, grade A	4-I	-	-	-	-	-	-	-	-	-	582	-	-	-	-	-
ZT-15-M zirconium (di-)oxide cermet	6-II	-	-	-	-	-	-	826	-	830	-	-	-	-	-	-