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# A BIBLIOGRAPHY ON MICROWAVE (ROTATIONAL) SPECTROSCOPY

by

James E. Wollrab

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# A BIBLIOGRAPHY ON MICROWAVE (ROTATIONAL) SPECTROSCOPY

by

James E. Wollrab

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## ABSTRACT

The references listed in this bibliography include a majority of the important papers and books that are related to the development of microwave spectroscopy. General references relating to the basic concepts of rotational and, in a limited way, vibrational spectroscopy are also included. Titles of dissertations, reports which have not been published in the open literature, and abstracts of papers presented at spectroscopy symposia generally are not given. Rather than a pure chronological listing, the references have been placed under specific topic headings whenever possible. A chronological order under these headings is maintained. Since a unique classification of each article is impossible, references which do not fall directly under one of the specific topics are listed in Section XII.

Several other bibliographies are available. Townes and Schawlow[20] compiled a complete listing up through 1954. In addition, Favero[35] has compiled a bibliography covering 1954 through 1962, and Starck[39] has completed one for 1945 through 1962. However, the latter two are not as generally available as might be desired. (See Section I.)

This bibliography includes a majority of the references concerning microwave spectroscopy through 1964, and a number of references from early 1965. Titles are listed to enable a better preliminary assessment of the articles. The listing is a print from IBM cards and a special notation is required in some instances. Atomic weights are given in parentheses following the atomic symbol, e.g., N(14) for $N^{14}$. All letters are in the upper case, e.g., L-TYPE DOUBLING is written for $l$-type doubling. Numerical subscripts are written on the same level as the atomic symbol, e.g., H2S is written for $H_2S$.

Preceding some of the reference lists are very brief resumes. These are not intented to serve as reviews of each area but merely to point out some of the more important or recent progress in each area.

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## Section II. INSTRUMENTATION

A majority of microwave studies have been carried out using the conventional square-wave Stark-modulated microwave spectrometer[5, 11, 21, 24, 112] employing phase-sensitive detection and a reflex klystron source. Measurements have been extended from X-band up into the millimeter wave region through the use of harmonic generators and the development of high frequency tubes.[45, 46, 62, 63, 89, 93, 128] Sensitivity and resolution have been improved by frequency stabilization[1, 6-8] and to a greater degree by phase stabilization of the source.

The demonstration of maser principles led to their use in the study of rotational spectra. Very narrow line widths have been achieved with beam-maser spectrometers[100, 113] allowing the observation of hyperfine splittings which are too small to be resolved on a conventional spectrometer. Maser action has also been used to identify weak transitions when they have levels in common with stronger lines whose quantum numbers are known.[94, 106]

Although Stark effect spectrometers predominate, Zeeman effect studies [32, 33, 107] have been accomplished using a variety of cell designs. Other specialized microwave spectrometers include cells with "flow-through" systems for the study of short-lived free radicals, parallel plate absorption cells for precision dipole moment measurements,[72] radio frequency and microwave molecular beam devices,[73, 116, 119] and high-temperature cells.[31, 48, 51] Relative and absolute absorption intensities, as well as line width measurements, also require specialized system design.[85, 102, 111, 141] Millimeter wave transitions are being investigated as a possible source for a millimeter frequency standard.[122-126, 132-135]

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## Section III. LINE SHAPE AND LINE BROADENING


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## Section IV. THE RIGID ROTOR

Calculation and characterization of the energy levels and wave functions of the rigid rotor immediately followed the introduction of the new quantum theory.[1-5] Application of group theory to the problem[6,9] considerably simplifies the computational difficulties presented by the asymmetric rotor whose energy levels cannot be expressed in a closed form except for low J values. Since the formulation of the reduced energy $E(\kappa)$,[8,9] the original tabulations of this parameter[9,17,22] have been extended to high J values for smaller intervals of $\kappa$ through the use of high-speed digital computers.[19,47,49-53] Approximate methods were also developed,[11,12] particularly for near symmetric top molecules.[25-27,41,42] Considerable attention has also been given to the calculation of theoretical line intensities.[10,18,32]

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## Section VI. MOLECULAR STRUCTURE

Most microwave structure determinations have been carried out using the general isotopic substitution formulas in terms of the equilibrium moments of inertia developed by Kraitchman.[7] The $r_s$ and $r_o$ structures have been compared and discussed[14] regarding the equilibrium structure, and a double substitution technique has been devised to treat small coordinates.[20,22] The effects of molecular vibrations on the molecular structure[32] and, in particular, on the inertia defect[27,34,37,39,42] determined from microwave data have received considerable attention.

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## Section VII. QUADRUPOLE COUPLING

Nuclear quadrupole interactions can perturb the rotational spectrum of a molecule which contains one or more nuclei with nonspherical nuclear charge distributions. These effects have been studied in linear, symmetric, and asymmetric top molecules[19, 21] to provide information concerning the electric field gradient at the quadrupole nucleus. Second-order effects can become prominent when the quadrupole interaction is sizable or when an appropriate near degeneracy is present.[100, 102, 103] In the case of an asymmetric rotor, the second-order interaction may lead to an evaluation of an off-diagonal coupling constant $X_{ij}$. Intensities of the hyperfine components have been adopted directly from atomic spectra.[2, 3] Bersohn[37] and Misushima and Ito[48] have treated the case of three quadrupole nuclei in a symmetric rotor. Work has also been done on asymmetric rotors with two quadrupole nuclei.[104-106, 109, 112] As experimental sensitivity is improved, coupling in excited vibrational states may be studied.[86, 88] Interactions with an external electric field are referenced in Section X.

Excellent reviews on the subject have been written by Das and Hahn[97] and O'Konski.[107]

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## Section VIII. HINDERED INTERNAL ROTATION

Studies of internal rotation by microwave spectroscopy have been favored by the relative barrier heights hindering internal rotation in methyl groups and the relatively low vibrational frequencies associated with these torsional motions. Most of the barriers for $CH_3$-X type molecules, where X represents the frame of the molecule, fall in the region from 1-4 kilocalories which allows splitting of rotational transitions by rotation-internal rotation interactions to be observed either in the ground vibrational state or in excited torsional states. The latter is usually the vibrational modes of lowest frequency and is relatively well populated.

The theoretical methods to be applied to single top molecules have been reviewed by Lin and Swalen.[100] In most cases the problem consists of a symmetric top attached to an asymmetric frame.[52,70] Extensions have been made to treat two-top molecules,[118-120] asymmetric top and frame,[39,136] cis-gauche-trans configurations of C-C bonds,[122,123,147] and symmetric top molecules through excited states[87,88] and Coriolis effects.[140]

Herschbach[134] has listed the barrier values determined through 1962 in a complete review of experimental results.

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## Section IX. INVERSION

Early microwave studies of ammonia[8-12, 14-17] led to an immediate interest in the inversion problem. A number of twofold, potential functions[2-6, 13, 21, 52, 53] were applied to ammonia to calculate the barrier height and inversion splittings. These functions have also been adapted to inversion in asymmetric rotors.[20, 47, 56, 58, 62] Recent interest has been directed toward near-planar molecules,[40, 44, 50, 61] and has led to the development of matrix elements in both the harmonic oscillator and quartic oscillator representations.[54, 55] These efforts have been aided by far-infrared vibrational data.[43]

The J-dependence of the inversion doubling has been treated with expressions of linear[20, 47, 59] and exponential dependence.[18, 59] Interactions with other molecular vibrations have been of considerable interest in ammonia[29, 53] and methylamine.[24, 34, 35] The possibility of two coupled inversion-type motions was encountered in hydrazine.[47, 57]

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## Section X. STARK EFFECT


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## Section XII. GENERAL MICROWAVE PAPERS AND RELATED TOPICS


1. H.A.KRAMERS,Z.PHYSIK 39,828-840(1926) WAVE MECHANICS AND SEMI-NUMERICAL QUANTIZATION

2. M.BORN AND J.R.OPPENHEIMER,ANN.PHYSIK 4-84,457-484(1927) QUANTUM THEORY OF MOLECULES

3. B.PODOLSKY, PHYS.REV. 32,812-816(1928) QUANTUM-MECHANICALLY CORRECT FORM OF HAMILTONIAN FUNCTION FOR CONSERVATIVE SYSTEMS

4. P.M.MORSE,PHYS.REV.34,57-64(1929) DIATOMIC MOLECULES ACCORDING TO THE WAVE MECHANICS II.VIBRATIONAL LEVELS

5. C.ECKART,REV.MOD.PHYS.2,305-380(1930) THE APPLICATION OF GROUP THEORY TO THE QUANTUM DYNAMICS OF MONATOMIC SYSTEMS

6. R.S.MULLIKEN,REVS.MOD.PHYS.2,60-115(1930) THE INTERPRETATION OF BAND SPECTRA PARTS I,IIA,IIB

7. D.M.DENNISON,REVS.MOD.PHYS.3,280-345(1931) THE INFRARED SPECTRA OF POLYATOMIC MOLECULES. PART I.

8. E.FERMI,Z.PHYSIK 71,250-259(1931) ON THE RAMAN EFFECT IN CARBON DIOXIDE

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98. D.K.COLES AND R.H.HUGHES,PHYS.REV.76,178 (1949) MICROWAVE SPECTRA OF NITROUS OXIDE

99. D.K.COLES AND R.H.HUGHES,PHYS.REV.76,858(1949) MICROWAVE SPECTRUM OF CF3CL

100. G.L.CUNNINGHAM,A.W.BOYD,W.D.GWINN,AND W.I.LEVAN,J.CHEM.PHYS.17, 211-212(1949) STRUCTURE OF ETHYLENE OXIDE

101. B.P.DAILEY,J.M.MAYS,AND C.H.TOWNES,PHYS.REV.76,136-137(1949) MICROWAVE ROTATIONAL SPECTRA AND STRUCTURES OF GEH3CL,SIH3CL,AND CH3CL

102. H.D.EDWARDS,O.R.GILLIAM,AND W.GORDY,PHYS.REV.76,196 (1949) MICROWAVE SPECTRUM OF METHYL ALCOHOL AND OF METHYL AMINE

103. D.A.GILBERT,A.ROBERTS, AND P.A.GRISWOLD,PHYS.REV.76,1723(1949) NUCLEAR AND MOLECULAR INFORMATION FROM THE MICROWAVE SPECTRUM OF FCL

104. O.R.GILLIAM,H.D.EDWARDS,AND W.GORDY,PHYS.REV.75,1014-1016(1949) MICROWAVE INVESTIGATIONS OF METHYL FLUORIDE,FLUOROFORM, AND PHOSPHORUS TRI-FLUORIDE

105. W.LOW AND C.H.TOWNES,PHYS.REV.75,529-530(1949) O(17) AND S(36) IN THE ROTATIONAL SPECTRUM OF OCS

106. M.MIZUSHIMA,J.PHYS.SOC.JAPAN 4,191-196(1949) ON THE AMMONIA MOLECULE II.

107. W.J.PIETENPOL AND J.D.ROGERS ,PHYS.REV.76,690-691(1949) MICROWAVE ABSORPTION SPECTRUM OF METHYLENE BROMIDE

108. A.ROBERTS AND W.F.EDGELL,J.CHEM.PHYS.17,742-743(1949) THE MICROWAVE SPECTRUM OF CF2=CH2

109. A.H.SHARBAUGH ,J.K.BRAGG,T.C.MADISON,AND V.G.THOMAS,PHYS.REV.76,1419 (1949) THE DETERMINATION OF THE MOLECULAR STRUCTURE OF BROMOSILANE BY MICROWAVE MEASUREMENTS

110. A.H.SHARBAUGH AND J.MATTERN,PHYS.REV.75,1102(1949) MICROWAVE SPECTRUM OF METHYL BROMIDE

111. J.W.SIMMONS,PHYS.REV.76,686(1949) THE MICROWAVE SPECTRA OF CD3CL AND CD3I

112. W.V.SMITH AND R.R.UNTERBERGER,J.CHEM.PHYS.17,1348(1949) MICROWAVE

INVESTIGATIONS OF CHLOROFORM

113. M.W.P.STRANDBERG,J.CHEM.PHYS.17,901-904(1949) ROTATIONAL ABSORPTION SPECTRUM OF HDO

114. M.W.P.STRANDBERG,C.Y.MENG,AND J.G.INGERSOLL,PHYS.REV.75,1524-1528 (1949) THE MICROWAVE ABSORPTION SPECTRUM OF OXYGEN

115. M.W.P.STRANDBERG,C.S.PEARSALL,AND M.T.WEISS,J.CHEM.PHYS.17,429(1949) ON THE ELECTRIC DIPOLE MOMENT AND VIBRATIONAL STATES OF H3B(10)CO

116. M.W.P.STRANDBERG,T.WENTINK,JR., AND A.G.HILL,PHYS.REV.75,827-832 (1949) THE MICROWAVE SPECTRUM OF CARBONYL SELENIDE

117. M.W.P.STRANDBERG,T.WENTINK,JR., AND R.L.KYHL,PHYS.REV.75,270-278 (1949) ROTATIONAL ABSORPTION SPECTRUM OF OCS

118. A.A.WESTENBERG,J.H.GOLDSTEIN, AND E.B.WILSON,JR.,J.CHEM.PHYS.17, 1319-1321(1949) THE MICROWAVE SPECTRUM OF CHLOROACETYLENE AND DEUTEROCHLOROACETYLENE

119. E.AMBLE AND B.P.DAILEY,J.CHEM.PHYS.18,1422(1950) THE STRUCTURE AND DIPOLE MOMENT OF HYDRAZOIC ACID

120. B.BAK,E.S.KNUDSEN,E.MADSEN,AND J.RASTRUP-ANDERSEN,PHYS.REV.79,190 (1950) PRELIMINARY ANALYSIS OF THE MICROWAVE SPECTRUM OF KETENE

121. B.BAK,R.SLOAN,AND D.WILLIAMS,PHYS.REV.80,101-102(1950) MICROWAVE INVESTIGATION OF SCSE

122. C.I.BEARD AND B.P.DAILEY,J.CHEM.PHYS.18,1437-1441(1950) THE STRUCTURE AND DIPOLE MOMENT OF ISOTHIOCYANIC ACID ERRATA-J.CHEM.PHYS.19,975(1951)

123. H.J.BERNSTEIN,J.CHEM.PHYS.18,1514(1950) THE STRUCTURE OF NITROSYL CHLORIDE FROM THE MICROWAVE ABSORPTION SPECTRUM

124. J.K.BRAGG,T.C.MADISON,AND A.H.SHARBAUGH,PHYS.REV.77,148-149(1950) MICROWAVE SPECTRUM OF CH2CFCL ERRATA-PHYS.REV.77,571(1950)

125. D.K.COLES,W.E.GOOD, AND R.H.HUGHES,PHYS.REV.79,224 (1950) MICROWAVE SPECTRUM OF METHYL CYANIDE AND ITS ISOTOPIC MODIFICATIONS

126. C.D.CORNWELL,J.CHEM.PHYS.18,1118-1119(1950) MICROWAVE SPECTRA OF BROMODIBORANE AND VINYL BROMIDE

127. S.GESCHWIND,H.MINDEN, AND C.H.TOWNES,PHYS.REV.78,174-175(1950) MICROWAVE MEASUREMENTS ON THE STABLE SELENIUM ISOTOPES IN OCSE

128. O.R.GILLIAM,C.M.JOHNSON, AND W.GORDY,PHYS.REV.78,140-144(1950) MICROWAVE SPECTROSCOPY IN THE REGION FROM TWO TO THREE MILLIMETERS

129. B.M.GIRDWOOD,CAN.J.RESEARCH 28A,180-189(1950) THE MICROWAVE ABSORPTION SPECTRUM OF METHANOL

130. W.GORDY,H.RING,AND A.B.BURG,PHYS.REV.78,512-517(1950) MICROWAVE DETERMINATION OF THE STRUCTURE OF BORINE CARBONYL AND OF THE NUCLEAR MOMENTS OF THE STABLE BORON ISOTOPES

131. W.GORDY AND J.SHERIDAN,PHYS.REV.79,224 (1950) MICROWAVE SPECTRA OF THE METHYL MERCURIC HALIDES

132. L.H.JONES,J.N.SHOOLERY,R.G.SHULMAN,AND D.M.YOST,J.CHEM.PHYS.18, 990-991(1950) THE MOLECULAR STRUCTURE OF ISOCYANIC ACID FROM MICROWAVE AND INFRARED ABSORPTION SPECTRA

133. W.KESSLER,H.RING,R.TRAMBARULO, AND W.GORDY,PHYS.REV.79,54-56(1950) MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF METHYL CYANIDE AND METHYL ISOCYANIDE

134. P.KISLIUK AND C.H.TOWNES,J.CHEM.PHYS.18,1109-1111(1950) THE MICROWAVE SPECTRA AND MOLECULAR STRUCTURE OF PHOSPHORUS AND ARSENIC TRICHLORIDE

135. J.H.N.LOUBSER AND J.A.KLEIN,PHYS.REV.78,348 (1950) ABSORPTION OF MILLIMETER WAVES IN ND3

136. W.LOW AND C.H.TOWNES,PHYS.REV.80,608-611(1950) EVIDENCE FROM NUCLEAR MASSES ON PROPOSED CLOSED SHELLS AT 20 NUCLEONS

137. G.MATLACK,G.GLOCKER,D.R.BIANCO, AND A.ROBERTS,J.CHEM.PHYS.18, 332-334(1950) THE MICROWAVE SPECTRA OF ISOTOPIC METHYL CHLORIDE

138. H.T.MINDEN,J.M.MAYS,AND B.P.DAILEY,PHYS.REV.78,347 (1950) THE MICROWAVE SPECTRUM OF CH3SIF3

139. W.J.PIETENPOL,J.D.ROGERS,AND D.WILLIAMS,PHYS.REV.78,480-481(1950) MICROWAVE SPECTRA OF ASYMMETRIC TOP MOLECULES

140. S.J.SENATORE,PHYS.REV.78,293-294(1950) MICROWAVE ABSORPTION SPECTRA OF POF3

141. A.H.SHARBAUGH ,B.S.PRITCHARD,AND T.C.MADISON,PHYS.REV.77,302(1950) MICROWAVE SPECTRUM OF CF3BR

142. A.H.SHARBAUGH,B.S.PRITCHARD,V.G.THOMAS,J.M.MAYS,AND B.P.DAILEY, PHYS.REV.79,189(1950) THE MICROWAVE ROTATIONAL SPECTRUM AND STRUCTURE OF BROMOGERMANE

143. A.H.SHARBAUGH,V.G.THOMAS,AND B.S.PRITCHARD,PHYS.REV.78,64-65(1950) A DETERMINATION OF THE DIPOLE MOMENT AND MOLECULAR STRUCTURE OF FLUOROSILANE

144. J.SHERIDAN AND W.GORDY,PHYS.REV.77,292-293(1950) INTERATOMIC DISTANCES IN CF3BR,CF3I,AND CF3CN

145. J.SHERIDAN AND W.GORDY,PHYS.REV.77,719(1950) MICROWAVE SPECTRA AND MOLECULAR CONSTANTS OF TRIFLUOROSILANE DERIVATIVES. SIF3H, SIF3CH3,SIF3CL,AND SIF3BR

146. J.SHERIDAN AND W.GORDY,PHYS.REV.79,224(1950) MICROWAVE SPECTRUM OF METHYL BROMOACETYLENE

147. J.SHERIDAN AND W.GORDY,PHYS.REV.79,513-515(1950) THE NUCLEAR QUADRUPOLE MOMENT OF N(14) AND THE STRUCTURE OF NITROGEN TRIFLUORIDE FROM MICROWAVE SPECTRA

148. J.W.SIMMONS,W.E.ANDERSON,AND W.GORDY,PHYS.REV.77,77-79(1950) MICROWAVE SPECTRUM AND MOLECULAR CONSTANTS OF HYDROGEN CYANIDE ERRATA-PHYS.REV.86,1055(1952)

149. J.W.SIMMONS AND W.O.SWAN,PHYS.REV.80,289-290(1950) THE STRUCTURE OF METHYL BROMIDE FROM MICROWAVE SPECTRA

150. D.F.SMITH,M.TIDWELL, AND D.V.P.WILLIAMS,PHYS.REV.77,420-421(1950) THE MICROWAVE SPECTRUM OF BROMINE MONOFLUORIDE

151. D.F.SMITH,M.TIDWELL, AND D.V.P.WILLIAMS,PHYS.REV.79,1007-1008(1950) THE MICROWAVE SPECTRUM OF BRCL

152. A.L.SOUTHERN,H.W.MORGAN,G.W.KEILHOLTZ,AND W.V.SMITH,PHYS.REV.78, 639 -(1950) THE ISOTOPIC ANALYSIS OF NITROGEN BY MEANS OF A MICROWAVE MASS SPECTROGRAPH

153. R.TRAMBARULO AND W.GORDY,PHYS.REV.79,224-225 (1950) MICROWAVE SPECTRA AND MOLECULAR CONSTANTS OF CD3NC AND CD3CN

154. R.TRAMBARULO AND W.GORDY,J.CHEM.PHYS.18,1613-1616(1950) THE MICROWAVE SPECTRUM AND STRUCTURE OF METHYL ACETYLENE

155. R.R.UNTERBERGER,R.TRAMBARULO, AND W.V.SMITH,J.CHEM.PHYS.18,565-566 (1950) MICROWAVE DETERMINATION OF THE STRUCTURE OF CHLOROFORM

156. A.A.WESTENBERG AND E.B.WILSON,JR.,J.AM.CHEM.SOC.72,199-200(1950) THE MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF CYANOACETYLENE

157. J.Q.WILLIAMS AND W.GORDY,J.CHEM.PHYS.18,994-995(1950) MICROWAVE SPECTRA AND MOLECULAR CONSTANTS OF TERTIARY BUTYL CHLORIDE,BROMIDE, AND IODIDE

158. J.Q.WILLIAMS AND W.GORDY,PHYS.REV.79,225 (1950) MICROWAVE SPECTRUM OF BROMOFORM AND PHOSPHORUS TRIBROMIDE

159. E.AMBLE,PHYS.REV.83,210 (1951) THE STRUCTURE AND DIPOLE MOMENT OF TRIOXANE

160. W.E.ANDERSON,J.SHERIDAN, AND W.GORDY,PHYS.REV.81,819-821(1951) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF GEF3CL

161. W.E.ANDERSON,R.TRAMBARULO,J.SHERIDAN, AND W.GORDY,PHYS.REV.82,58-60 (1951) THE MICROWAVE SPECTRUM AND MOLECULAR CONSTANTS OF TRIFLUOROMETHYL ACETYLENE

162. D.G.BURKHARD AND D.M.DENNISON,PHYS.REV.84,408-417(1951) THE MOLECULAR STRUCTURE OF METHYL ALCOHOL

163. R.O.CARLSON,C.A.LEE, AND B.P.FABRICAND,PHYS.REV.85,784-787(1951) THE MOLECULAR BEAM ELECTRIC RESONANCE METHOD STUDY OF THALLIUM MONOCHLORIDE

164. G.F.CRABLE AND W.V.SMITH,J.CHEM.PHYS.19,502(1951) THE STRUCTURE AND DIPOLE MOMENT OF SO2 FROM MICROWAVE SPECTRA

165. G.L.CUNNINGHAM,JR.,A.W.BOYD,R.J.MYERS,W.D.GWINN, AND W.F.LEVAN, J.CHEM.PHYS.19,676-685(1951) THE MICROWAVE SPECTRA,STRUCTURE, AND DIPOLE MOMENTS OF ETHYLENE OXIDE AND ETHYLENE SULFIDE

166. S.GESCHWIND AND R.GUNTHER-MOHR,PHYS.REV.81,882-883(1951) MICROWAVE STUDY OF GE,SI, AND S MASSES

167. R.H.HUGHES,W.E.GOOD, AND D.K.COLES,PHYS.REV.84,418-425(1951) MICROWAVE SPECTRUM OF METHYL ALCOHOL

168. F.K.HURD AND W.D.HERSCHBERGER,PHYS.REV.82,95-96(1951) MICROWAVE SPECTRUM OF METHYL MERCAPTAN

169. C.M.JOHNSON,R.TRAMBARULO,AND W.GORDY,PHYS.REV.84,1178-1180(1951) MICROWAVE SPECTROSCOPY IN THE REGION FROM TWO TO THREE MILLIMETERS. PART II.

170. P.KISLIUK AND C.H.TOWNES,PHYS.REV.83,210 (1951) NEW MICROWAVE DATA ON TRICHLORIDES OF ELEMENTS OF THE FIFTH COLUMN

171. D.R.LIDE,JR.,J.CHEM.PHYS.19,1605-1606(1951) THE MICROWAVE SPECTRUM OF METHYL STANNANE

172. C.C.LOOMIS AND M.W.P.STRANDBERG,PHYS.REV.81,798-807(1951) MICROWAVE SPECTRUM OF PHOSPHINE,ARSINE, AND STILBINE

173. R.G.LUCE AND J.W.TRISCHKA,PHYS.REV.83,851-852(1951) MOLECULAR CONSTANTS OF CS(133)CL(35)

174. N.W.LUFT,DIS. FARADAY SOC.10,117-118(1951) GENERAL DISCUSSION

175. H.LYONS,L.J.RUEGER,R.G.NUCKOLLS,AND M.KESSLER,PHYS.REV.81,630-631 (1951) MICROWAVE SPECTRA OF DEUTERO-AMMONIAS

176. K.B.MCAFEE,JR.,PHYS.REV.82,971(1951) MICROWAVE SPECTRUM OF NO2

177. S.L.MILLER,A.JAVAN, AND C.H.TOWNES,PHYS.REV.82,454-455(1951) THE SPIN OF O(18)

178. J.D.ROGERS,W.J.PIETENPOL,AND D.WILLIAMS,PHYS.REV.83,431-434(1951) THE MICROWAVE ABSORPTION SPECTRUM OF NITROSYL CHLORIDE NOCL

179. J.D.ROGERS AND D.WILLIAMS,PHYS.REV.82,131 (1951) MICROWAVE ABSORPTION SPECTRUM OF HYDROGEN AZIDE

180. J.D.ROGERS AND D.WILLIAMS,PHYS.REV.83,210 (1951) MICROWAVE ABSORPTION SPECTRUM OF FORMIC ACID VAPOR

181. T.F.ROGERS,PHYS.REV.83,881 (1951) FAR WING ABSORPTION OF ATMOSPHERIC SPECTRUM LINES

182. T.M.SHAW AND J.J.WINDLE,J.CHEM.PHYS.19,1063-1064(1951) MICROWAVE SPECTRUM AND DIPOLE MOMENT OF METHYL MERCAPTAN

183. J.SHERIDAN AND W.GORDY,J.CHEM.PHYS.19,965-970(1951) THE MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF TRIFLUOROSILANE DERIVATIVES

184. J.N.SHOOLERY,R.G.SHULMAN,AND D.M.YOST,J.CHEM.PHYS. 19,250-251(1951) DIPOLE MOMENT AND ELECTRIC QUADRUPOLE EFFECTS IN HNCO AND HNCS

185. M.H.SIRVETZ,J.CHEM.PHYS.19,938-941(1951) THE MICROWAVE SPECTRUM OF

SULFUR DIOXIDE

186. M.H.SIRVETZ,J.CHEM.PHYS.19,1609-1610(1951) THE MICROWAVE SPECTRUM OF FURAN

187. D.F.SMITH,M.TIDWELL,D.V.P.WILLIAMS, AND S.J.SENATORE,PHYS.REV.83, 485 (1951) THE MICROWAVE SPECTRUM OF CARBONYL FLUORIDE

188. R.M.TALLEY AND A.H.NIELSEN,J.CHEM.PHYS.19,805-806(1951) VIBRATION ROTATION TRANSITIONS OF C2D2 IN THE MICROWAVE REGION

189. E.AMBLE,S.L.MILLER,A.L.SCHAWLOW, AND C.H.TOWNES,J.CHEM.PHYS.20-192 (1952) MICROWAVE SPECTRUM AND STRUCTURE OF REO3CL

190. R.O.CARLSON,C.A.LEE,AND B.P.FABRICAND,PHYS.REV.85,784-787(1952) THE MOLECULAR BEAM ELECTRIC RESONANCE METHOD STUDY OF THALLIUM MONOCHLORIDE

191. V.W.COHEN,ANN.N.Y.ACAD.SCI.55,904-914(1952) SPECTROSCOPY OF RADIOACTIVE MOLECULES

192. R.M.FRISTROM,J.CHEM.PHYS.20,1-5(1952) THE MICROWAVE SPECTRUM OF A SLIGHTLY ASPHERICAL TOP-THE STRUCTURE AND DIPOLE MOMENT OF SULFURYL FLUORIDE

193. S.N.GHOSH,R.TRAMBARULO,AND W.GORDY,J.CHEM.PHYS.20,605-607(1952) MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF FLUOROFORM,CHLOROFORM, AND METHYL CHLOROFORM

194. N.J.HAWKINS,V.W.COHEN,AND W.S.KOSKI,J.CHEM.PHYS.20,528(1952) THE MICROWAVE SPECTRA OF POF3 AND PSF3

195. H.J.HROSTOWSKI,R.J.MYERS,AND G.C.PIMENTEL,J.CHEM.PHYS.20,518(1952) THE MICROWAVE SPECTRA AND DIPOLE MOMENT OF STABLE PENTABORANE

196. A.JAVAN AND A.V.GROSSE,PHYS.REV.87,227 (1952) MICROWAVE SPECTRUM OF MNO3F

197. H.R.JOHNSON AND M.W.P.STRANDBERG,J.CHEM.PHYS.20,687-695(1952) THE MICROWAVE SPECTRUM OF KETENE

198. P.KISLIUK AND G.A.SILVEY,J.CHEM.PHYS.20,517(1952) THE MICROWAVE SPECTRUM OF CF3SF3

199. S.KOJIMA,K.TSUKADA,S.HAGIWARA,M.MIZUSHIMA,AND T.ITO, J.CHEM.PHYS.20, 804-808(1952) MICROWAVE SPECTRA OF CHBR3 IN THE REGION FROM 11 TO 12.5 CENTIMETERS

200. D.R.LIDE,JR.,J.CHEM.PHYS.20,1812(1952) PRELIMINARY ANALYSIS OF THE PURE-ROTATIONAL SPECTRUM OF METHYL AMINE ERRATA-J.CHEM.PHYS.21, 571(1953)

201. D.R.LIDE,JR.,J.AM.CHEM.SOC.74,3548-3552(1952) THE MICROWAVE SPECTRUM AND STRUCTURE OF METHYLENE FLUORIDE

202. J.T.MASSEY AND D.R.BIANCO,PHYS.REV.85,717-718 (1952) MICROWAVE ABSORPTION SPECTRUM OF H2O2

203. J.M.MAYS,ANN.N.Y.ACAD.SCI.55,789-799(1952) SPECTROSCOPIC

MEASUREMENTS ON HIGH-BOILING,REACTIVE,AND UNSTABLE MOLECULES

204. J.M.MAYS AND B.P.DAILEY,J.CHEM.PHYS.20,1695-1703(1952) MICROWAVE SPECTRA AND STRUCTURES OF XYH3 MOLECULES

205. S.L.MILLER,L.C.AAMODT,G.DOUSMANIS,C.H.TOWNES,AND J.KRAITCHMAN, J.CHEM.PHYS.20,1112-1114(1952) STRUCTURE OF METHYL HALIDES

206. R.MOCKLER,J.H.BAILEY, AND W.GORDY,PHYS.REV.87,172 (1952) MICROWAVE INVESTIGATIONS OF HSICL3 AND CH3SICL3

207. H.W.MORGAN AND J.H.GOLDSTEIN,J.CHEM.PHYS.20,1981(1952) THE MICROWAVE SPECTRUM OF VINYLACETATE

208. A.H.NETHERCOT,J.A.KLEIN, AND C.H.TOWNES, PHYS.REV.86,798-799(1952) THE MICROWAVE SPECTRUM AND MOLECULAR CONSTANTS OF HYDROGEN CYANIDE

209. N.F.RAMSEY,PHYS.REV.87,1075-1079(1952) VIBRATIONAL AND CENTRIFUGAL EFFECTS ON NUCLEAR INTERACTIONS AND ROTATIONAL MOMENTS IN MOLECULES

210. A.L.SCHAWLOW,ANN.N.Y.ACAD.SCI.55,955-965(1952) SIGNIFICANCE OF THE RESULTS OF MICROWAVE SPECTROSCOPY FOR NUCLEAR THEORY

211. J.SHERIDAN AND W.GORDY,J.CHEM.PHYS.20,591-595(1952) THE MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF TRIFLUOROMETHYL BROMIDE, IODIDE, AND CYANIDE

212. J.SHERIDAN AND W.GORDY,J.CHEM.PHYS.20,735-738(1952) THE MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF METHYL BROMOACETYLENE AND METHYL IODOACETYLENE

213. G.SILVEY,W.A.HARDY, AND C.H.TOWNES,PHYS.REV.87,236 (1952) MASSES OF THE STABLE TELLURIUM ISOTOPES FROM THE MICROWAVE SPECTRUM OF TECS

214. J.W.SIMMONS AND J.H.GOLDSTEIN,J.CHEM.PHYS.20,122-124(1952) THE MICROWAVE SPECTRA OF THE DEUTERATED METHYL HALIDES

215. D.F.SMITH AND D.W.MAGNUSON,PHYS.REV.87,226-227 (1952) THE MICROWAVE SPECTRUM OF NITRYL FLUORIDE

216. S.J.TETENBAUM,PHYS.REV.86,440-446(1952) MICROWAVE SPECTRUM OF BRCN AT SIX MILLIMETERS

217. S.J.TETENBAUM,PHYS.REV.88,772-774(1952) SIX-MILLIMETER SPECTRA OF OCS AND N2O

218. T.L.WEATHERLY AND D.WILLIAMS,J.CHEM.PHYS.20,755(1952) THE MICROWAVE ABSORPTION SPECTRUM OF ACETONE VAPOR

219. W.S.WILCOX AND J.H.GOLDSTEIN,J.CHEM.PHYS.20,1656-1657(1952) EVIDENCE FOR A COMPLETELY PLANAR STRUCTURE OF PYRROLE FROM ITS MICROWAVE SPECTRUM

220. W.S.WILCOX,J.H.GOLDSTEIN,AND J.W.SIMMONS,PHYS.REV.87,172(1952) THE MICROWAVE SPECTRUM OF VINYL CYANIDE

221. Q.WILLIAMS,J.T.COX, AND W.GORDY,J.CHEM.PHYS.20,1524-1525(1952) MOLECULAR STRUCTURE OF BROMOFORM

222. Q.WILLIAMS,J.SHERIDAN, AND W.GORDY,J.CHEM.PHYS.20,164-167(1952) MICROWAVE SPECTRA AND MOLECULAR STRUCTURES OF POF3,PSF3,POCL3, AND PSCL3

223. F.ANDERSON,J.R.ANDERSEN,B.BAK,O.BASTIENSEN,E.RISBERG,AND L.SMEDVIK, J.CHEM.PHYS.21,373(1953) ELECTRON DIFFRACTION AND MICROWAVE INVESTIGATION OF TERTIARY BUTYL FLUORIDE

224. W.F.ARENDALE AND W.H.FLETCHER,J.CHEM.PHYS.21,1898(1953) THE GEOMETRY OF KETENE

225. B.BAK,J.BRUHN,AND J.RASTRUP-ANDERSEN,J.CHEM.PHYS.21,752-753(1953) MICROWAVE SPECTRUM AND STRUCTURE OF SID3F

226. B.BAK,J.BRUHN,AND J.RASTRUP-ANDERSEN,J.CHEM.PHYS.21,753-754(1953) MICROWAVE SPECTRUM AND STRUCTURE OF SID3CL

227. B.BAK AND J.RASTRUP-ANDERSEN,J.CHEM.PHYS.21,1305-1306(1953) MICROWAVE INVESTIGATION OF PYRIDINE

228. Y.BEERS AND S.WEISBAUM,PHYS.REV.91,1014(1953) AN ULTRA-HIGH FREQUENCY ROTATIONAL LINE OF HDO

229. R.BIRD AND R.C.MOCKLER,PHYS.REV.91,222 (1953) THE MICROWAVE SPECTRUM OF THE UNSTABLE MOLECULE CARBON MONOSULFIDE

230. G.BIRNBAUM AND A.A.MARYOTT,PHYS.REV.92,270-273(1953) CHANGE IN THE INVERSION SPECTRUM OF ND3 FROM RESONANT TO NONRESONANT ABSORPTION

231. C.A.BURRUS AND W.GORDY,PHYS.REV.92,1437-1439(1953) ONE-TO-TWO MILLIMETER WAVE SPECTROSCOPY. III. NO AND DI

232. C.A.BURRUS AND W.GORDY,PHYS.REV.92,274-277(1953) ONE-TO-TWO MILLIMETER WAVE SPECTROSCOPY. II. H2S

233. H.D.CRAWFORD,J.CHEM.PHYS.21,2099(1953) TWO NEW LINES IN THE MICROWAVE SPECTRUM OF HEAVY WATER

234. B.P.DAILEY,PHYS.REV.90,337-338 (1953) THE ROTATIONAL SPECTRUM AND MOLECULAR STRUCTURE OF CYCLOPROPYL CHLORIDE

235. G.C.DOUSMANIS,T.M.SANDERS,C.H.TOWNES, AND H.J.ZEIGER,J.CHEM.PHYS.21, 1416-1417(1953) STRUCTURE OF HNCS FROM MICROWAVE SPECTRA

236. G.ERLANDSSON,ARKIV.FYSIK 6,477-478(1953) MICROWAVE SPECTRUM OF FLUOROBENZENE

237. G.ERLANDSSON,ARKIV FYSIK 6,69-71(1953) MEASUREMENTS OF THE MICROWAVE SPECTRA OF METHYL ALCOHOL AND NITROMETHANE

238. G.ERLANDSSON,ARKIV FYSIK 6,491-495(1953) PRELIMINARY ANALYSIS OF THE MICROWAVE SPECTRUM OF FORMIC ACID

239. R.C.FERGUSON AND E.B.WILSON,JR.,PHYS.REV.90,338(1953) THE MICROWAVE SPECTRUM AND STRUCTURE OF THIONYL FLUORIDE

240. A.HONIG,M.L.STITCH, AND M.MANDEL,PHYS.REV.92,901-902(1953) MICROWAVE SPECTRA OF CSF,CSCL,AND CSBR

241. R.H.HUGHES,J.CHEM.PHYS.21,959-960(1953) THE MICROWAVE SPECTRUM AND STRUCTURE OF OZONE

242. E.V.IVASH AND D.M.DENNISON,J.CHEM.PHYS.21,1804-1816(1953) THE METHYL ALCOHOL MOLECULE AND ITS MICROWAVE SPECTRUM

243. C.K.JEN,D.R.BIANCO,AND J.T.MASSEY,J.CHEM.PHYS.21,520-525(1953) SOME HEAVY WATER ROTATIONAL ABSORPTION LINES

244. R.D.JOHNSON,R.J.MYERS,AND W.D.GWINN,J.CHEM.PHYS.21,1425(1953) MICROWAVE SPECTRUM AND DIPOLE MOMENT OF ETHYLENIMINE

245. W.C.KING AND W.GORDY,PHYS.REV.90,319-320(1953) ONE TO TWO MILLIMETER WAVE SPECTROSCOPY. I.

246. P.KISLIUK AND S.GESCHWIND,J.CHEM.PHYS.21,828-829(1953) THE MICROWAVE SPECTRUM OF ARSENIC TRIFLUORIDE

247. J.A.KLEIN AND A.H.NETHERCOT,PHYS.REV.91,1018(1953) MICROWAVE SPECTRUM OF DI AT 1.5 MM WAVELENGTH

248. J.H.N.LOUBSER,J.CHEM.PHYS.21,2231-2232(1953) PRELIMINARY WORK ON THE MICROWAVE SPECTRUM OF ACETIC ACID

249. K.E.MCCULLOH AND G.F.POLLNOW,J.CHEM.PHYS.21,2082(1953) MICROWAVE SPECTRUM OF PYRIDINE

250. M.MIZUSHIMA,J.CHEM.PHYS.21,1222-1224(1953) THEORY OF THE ROTATIONAL SPECTRA OF ALLENE-TYPE MOLECULES

251. M.MIZUSHIMA AND P.VENKATESWARLU,J.CHEM.PHYS.21,705-709(1953) THE POSSIBLE MICROWAVE ABSORPTION IN THE MOLECULES BELONGING TO THE POINT GROUPS D2D=VD AND TD

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253. R.C.MOCKLER AND W.GORDY,PHYS.REV.91,222 (1953) MICROWAVE SPECTRUM OF TRIMETHYL CHLOROSILICANE

254. N.MULLER,J.AM.CHEM.SOC.75,860-863(1953) THE MICROWAVE SPECTRUM AND STRUCTURE OF CHLOROFLUOROMETHANE

255. A.H.NETHERCOT AND A.JAVAN,J.CHEM.PHYS.21,363-364(1953) THE MICROWAVE SPECTRUM OF C8H13BR AND C8H13CL

256. H.H.NIELSEN,J.CHEM.PHYS.21,142-144(1953) THE INFRARED SPECTRA AND THE MOLECULAR STRUCTURE OF PYRAMIDAL MOLECULES

257. R.G.NUCKOLLS,L.J.RUEGER, AND H.LYONS,PHYS.REV.89,1101(1953) MICROWAVE ABSORPTION SPECTRUM OF ND3

258. D.W.POSENER AND M.W.P.STRANDBERG,J.CHEM.PHYS.21,1401-1402(1953) MICROWAVE SPECTRUM OF HDO

259. G.W.ROBINSON,J.CHEM.PHYS.21,1741-1745(1953) THE MICROWAVE SPECTRUM OF PHOSGENE

260. A.H.SHAUBAUGH,G.A.HEATH,L.P.THOMAS, AND J.SHERIDAN,NATURE 171,87(1953) MICROWAVE SPECTRUM AND STRUCTURE OF IODOSILANE

261. K.SHIMODA AND T.NISHIKAWA,J.PHYS.SOC.JAPAN 8,133-134(1953) MICROWAVE SPECTRUM OF METHYLAMINE

262. K.SHIMODA AND T.NISHIKAWA,J.PHYS.SOC.JAPAN 8,425-426(1953) MICROWAVE SPECTRUM OF METHYLAMINE

263. M.E.SIRVETZ AND R.E.WESTON,J.CHEM.PHYS.21,898-902(1953) THE STRUCTURE OF PHOSPHINE

264. D.F.SMITH,J.CHEM.PHYS.21,609-614(1953) THE MICROWAVE SPECTRUM AND STRUCTURE OF CHLORINE TRIFLUORIDE

265. N.SOLIMENE AND B.P.DAILEY,PHYS.REV.91,464 (1953) THE ROTATIONAL SPECTRUM AND MOLECULAR STRUCTURE OF METHYL MERCAPTAN

266. T.E.TURNER,V.C.FIORA,W.M.KENDRICK,AND B.L.HICKS,J.CHEM.PHYS.21, 564-565(1953) PRELIMINARY ANALYSIS OF THE MICROWAVE SPECTRUM OF ETHYLENIMINE

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269. W.S.WILCOX,K.C.BRANNOCK,W.DEMORE, AND J.H.GOLDSTEIN,J.CHEM.PHYS.21, 563-564(1953) THE MICROWAVE SPECTRUM AND GENERAL PROPERTIES OF ETHYLENE IMINE

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271. B.BAK,L.HANSEN,AND J.RASTRUP-ANDERSEN,J.CHEM.PHYS.22,2013-2017(1954) MICROWAVE DETERMINATION OF THE STRUCTURE OF PYRIDINE

272. C.A.BURRUS AND W.GORDY,PHYS.REV.93,897-898(1954) SUBMILLIMETER WAVE SPECTROSCOPY

273. C.A.BURRUS,A.JACHE,AND W.GORDY,PHYS.REV.95,706-708(1954) ONE-TO-TWO MILLIMETER WAVE SPECTROSCOPY. V. PH3 AND PD3

274. C.D.CORNWELL AND R.L.POYNTER,J.CHEM.PHYS.22,1257(1954) THE MICROWAVE SPECTRUM OF VINYL IODIDE

275. B.B.DEMORE,W.S.WILCOX,AND J.H.GOLDSTEIN,J.CHEM.PHYS.22,876-880(1954) MICROWAVE SPECTRUM AND DIPOLE MOMENT OF PYRIDINE

276. G.ERLANDSSON,ARKIV FYSIK 7,189-192(1954) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF FLUOROBENZENE

277. G.ERLANDSSON,J.CHEM.PHYS.22,563-564(1954) MICROWAVE SPECTRUM OF CYCLOPENTANONE

278. G.ERLANDSSON,ARKIV FYSIK 8,341-342(1954) MICROWAVE SPECTRUM OF CHLOROBENZENE

279. G.ERLANDSSON,J.CHEM.PHYS.22,1152(1954) MICROWAVE SPECTRUM OF BENZONITRILE

280. R.C.FERGUSON,J.AM.CHEM.SOC.76,850-853(1954) THE MICROWAVE SPECTRUM ,STRUCTURE,AND DIPOLE MOMENT OF THIONYL FLUORIDE

281. W.GORDY,J.PHYS.RADIUM 15,521-523(1954) SPECTROSCOPY FROM 1 TO 5 MM WAVELENGTH

282. W.GORDY AND C.A.BURRUS,PHYS.REV.93,419-420(1954) SPECTRUM OF DBR IN THE ONE-MILLIMETER WAVE REGION

283. W.GORDY AND J.SHERIDAN,J.CHEM.PHYS.22,92-95(1954) MICROWAVE SPECTRA AND STRUCTURES OF METHYL MERCURY CHLORIDE AND BROMIDE

284. G.R.GUNTHER-MOHR,R.L.WHITE,A.L.SCHAWLOW,W.E.GOOD,AND D.K.COLES, PHYS.REV.94,1184-1191(1954) HYPERFINE STRUCTURE IN THE SPECTRUM OF N(14)H3. I. EXPERIMENTAL RESULTS

285. R.C.GUNTON,J.F.OLLOM,AND H.N.REXROAD,J.CHEM.PHYS.22,1942(1954) THE MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF (CH3)3SIF

286. W.A.HARDY AND G.SILVEY,PHYS.REV.95,385-388(1954) MICROWAVE SPECTRUM OF TECS AND MASSES OF THE STABLE TELLURIUM ISOTOPES

287. G.A.HEATH,L.F.THOMAS,AND J.SHERIDAN,TRANS.FARADAY SOC.50,779-783 (1954) THE STRUCTURE OF TRIFLUOROSILANE FROM MICROWAVE SPECTRA

288. A.HONIG,M.MANDEL,M.L.STITCH,AND C.H.TOWNES,PHYS.REV.96,629-642(1954) MICROWAVE SPECTRA OF THE ALKALI HALIDES

289. H.J.HROSTOWSKI AND R.J.MYERS,J.CHEM.PHYS.22,262-265(1954) THE MICROWAVE SPECTRA,STRUCTURE,AND DIPOLE MOMENT OF STABLE PENTABORANE

290. A.JACHE,G.BLEVINS,AND W.GORDY,PHYS.REV.95,299 (1954) MILLIMETER WAVE SPECTRUM OF ARSINE

291. A.JAVAN AND A.ENGELBRECHT,PHYS.REV.96,649-658(1954) MICROWAVE ABSORPTION SPECTRA OF MNO3F AND REO3CL

292. P.KISLIUK,J.CHEM.PHYS.22,86-92(1954) DIPOLE MOMENTS,NUCLEAR QUADRUPOLE COUPLINGS, AND THE BONDING ORBITALS IN GROUP V-TRIHALIDES

293. S.KOJIMA AND K.TSUKADA,J.CHEM.PHYS.22,2093-2094(1954) ON THE INTERPRETATION OF THE SPECTRUM OF BROMOFORM

294. J.A.KRAITCHMAN AND B.P.DAILEY,PHYS.REV.94,788 (1954) THE MICROWAVE SPECTRUM OF ETHYL FLUORIDE

295. D.R.LIDE,JR.,J.CHEM.PHYS.22,1577-1578(1954) MICROWAVE SPECTRUM AND STRUCTURE OF BENZONITRILE

296. R.J.LOVELL AND E.A.JONES,PHYS.REV.95,300 (1954) POTENTIAL CONSTANTS FOR CARBONYL FLUORIDE

297. J.F.LOTSPEICH,A.JAVAN,AND A.ENGELBRECHT,PHYS.REV.94,789 (1954)

THE MICROWAVE SPECTRUM OF REO3F

298. J.T.MASSEY,C.I.BEARD,AND C.K.JEN,PHYS.REV.95,622 (1954) A MICROWAVE SPECTRAL SERIES OF DEUTERATED HYDROGEN PEROXIDE

299. J.T.MASSEY AND D.R.BIANCO,J.CHEM.PHYS.22,442-448(1954) THE MICROWAVE SPECTRUM OF HYDROGEN PEROXIDE

300. M.MATRICON AND BONNET,J.PHYS.RADIUM 15,647-648(1954) SPECTRUM OF ETHYLAMINE

301. K.E.MCCULLOH AND G.F.POLLNOW,J.CHEM.PHYS.22,681-682(1954) AN INVESTIGATION OF THE MICROWAVE SPECTRUM OF PYRIDINE

302. M.PETER AND M.W.P.STRANDBERG,PHYS.REV.95,622 (1954) MICROWAVE SPECTRUM OF OCS

303. J.SHERIDAN AND L.F.THOMAS,NATURE 174,798(1954) MICROWAVE SPECTRUM OF METHYLCYANOACETYLENE

304. K.SHIMODA,T.NISHIKAWA,AND T.ITOH,J.PHYS.SOC.JAPAN 9,974-991(1954) MICROWAVE SPECTRUM OF METHYLAMINE

305. G.R.SLAYTON,J.W.SIMMONS,AND J.H.GOLDSTEIN,J.CHEM.PHYS.22,1678-1679 (1954) MICROWAVE SPECTRUM AND PROPERTIES OF VINYLENE CARBONATE

306. N.SOLIMENE AND B.P.DAILEY,J.CHEM.PHYS.22,2042-2044(1954) MICROWAVE SPECTRUM OF 1,1 DIFLUOROETHANE

307. F.STERZER,J.CHEM.PHYS.22,2094(1954) J=0→1 ROTATIONAL TRANSITION OF TRIFLUOROIODOMETHANE
ERRATUM- J.CHEM.PHYS.23,762(1955)

308. R.TRAMBARULO AND P.M.MOSER,J.CHEM.PHYS.22,1622-1623(1954) MICROWAVE SPECTRUM OF FORMIC ACID

309. R.S.WAGNER AND B.P.DAILEY,J.CHEM.PHYS.22,1459(1954) MICROWAVE SPECTRUM OF ETHYL CHLORIDE

310. W.S.WILCOX,J.H.GOLDSTEIN, AND J.W.SIMMONS,J.CHEM.PHYS.22,516-518 (1954) THE MICROWAVE SPECTRUM OF VINYL CYANIDE

311. B.BAK,L.HANSEN,AND J.RASTRUP-ANDERSEN,DIS.FARADAY SOC.19,30-38 (1955) MICROWAVE SPECTRA OF DEUTERATED FURANS-STRUCTURE OF THE FURAN MOLECULE

312. A.I.BARCHUKOV,T.M.MINAEVA,AND A.M.PRODHOROV,ZHUR.EKSPTL.I TEORET. FIZ.29,892(1955) MICROWAVE ROTATION SPECTRUM OF THE ETHYL CHLORIDF,C2H5CL,MOLECULE

313. A.H.BARRETT AND M.MANDEL,PHYS.REV.99,666 (1955) MICROWAVE SPECTRA OF INDIUM CHLORIDE AND BROMIDE

314. N.G.BASOV AND A.M.PROKHOROV,ZHUR.EKSPTL.I TEORET.FIZ.28,249-250 (1955) POSSIBLE METHOD FOR OBTAINING ACTIVE MOLECULES FOR A MOLECULAR GENERATOR

315. G.S.BLEVINS,A.W.JACHE,AND W.GORDY,PHYS.REV.97,684-686(1955) MILLIMETER WAVE SPECTRA OF ASH3 AND ASD3

316. J.H.BURKHALTER,J.CHEM.PHYS.23,1172(1955) MICROWAVE SPECTRUM OF CYCLOPENTANONE

317. C.A.BURRUS,JR. AND W.GORDY,PHYS.REV.97,1661-1664(1955) ONE-TO-TWO MILLIMETER WAVE SPECTRA OF TCL AND TBR

318. C.C.COSTAIN,J.CHEM.PHYS.23,2037-2041(1955) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF METHYL-CHLOROACETYLENE

319. J.T.COX,T.GAUMANN, AND W.J.O.THOMAS,DIS.FARADAY SOC.19,52-55(1955) MILLIMETER WAVE SPECTRUM OF METHYL MERCURY CHLORIDE

320. G.ERLANDSSON,ARKIV FYSIK 9,341-343(1955) MICROWAVE SPECTRUM OF CYCLOPENTENE OXIDE

321. J.FINE,J.H.GOLDSTEIN,AND J.W.SIMMONS,J.CHEM.PHYS.23,601(1955) MICROWAVE SPECTRUM OF S-TRANS-ACROLEIN

322. J.P.FRIEND,R.F.SCHNEIDER,AND B.P.DAILEY,J.CHEM.PHYS.23,1557(1955) MICROWAVE SPECTRUM OF CYCLOPROPYL CHLORIDE

323. J.J.GALLAGHER,W.C.KING,AND AND C.M.JOHNSON,PHYS.REV.98,1551(1955) THE MICROWAVE SPECTRUM OF N(15)O(16)

324. E.K.GORA,PHYS.REV.99,666(1955) MICROWAVE SPECTRUM OF THE OZONE MOLECULE

325. G.A.HEATH,L.F.THOMAS,E.I.SHERRARD,AND J.SHERIDAN,DIS.FARADAY SOC.19, 38-43(1955) THE MICROWAVE SPECTRUM AND STRUCTURE OF METHYL DIACETYLENE

326. J.A.HOWE AND J.H.GOLDSTEIN,J.CHEM.PHYS.23,1223-1225(1955) MICROWAVE SPECTRUM OF PROPIOLIC ALDEHYDE

327. T.ITO,J.PHYS.SOC.JAPAN 10,56-59(1955) MICROWAVE SPECTRUM OF SPCL3,THEORETICAL

328. A.W.JACHE,G.S.BLEVINS,AND W.GORDY,PHYS.REV.97,680-683(1955) MILLIMETER WAVE SPECTRA OF SBH3 AND SBD3

329. T.KOJIMA AND T.NISHIKAWA,J.PHYS.SOC.JAPAN 10,240-241(1955) MICROWAVE SPECTRUM OF METHYL MERCAPTAN I.

330. J.KRAITCHMAN AND B.P.DAILEY,J.CHEM.PHYS.23,184-190(1955) THE MICROWAVE SPECTRUM OF ETHYL FLUORIDE

331. R.J.KURLAND,J.CHEM.PHYS.23,2202-2203(1955) MICROWAVE SPECTRUM AND PLANARITY OF FORMAMIDE

332. N.KWAK,J.W.SIMMONS,AND J.H.GOLDSTEIN,J.CHEM.PHYS.23,2450(1955) MICROWAVE SPECTRUM OF PROPIOLACTONE

333. R.G.LERNER,J.P.FRIEND,AND B.P.DAILEY,J.CHEM.PHYS.23,210(1955) STRUCTURE AND BARRIER TO INTERNAL ROTATION OF FORMIC ACID FROM MICROWAVE DATA

334. M.MANDEL AND A.H.BARRETT,PHYS.REV.98,1159(1955) PURE ROTATION SPECTRA OF THE THALLIUM HALIDES

335. A.A.MARYOTT AND G.BIRNBAUM,PHYS.REV.99,1886(1955) MICROWAVE ABSORPTION IN COMPRESSED OXYGEN

336. D.J.MILLEN AND K.M.SINNOTT,CHEMISTRY AND INDUSTRY 1955,538(1955) THE MICROWAVE SPECTRUM AND STRUCTURE OF NITRYL CHLORIDE

337. R.C.MOCKLER AND G.R.BIRD,PHYS.REV.98,1837-1839(1955) MICROWAVE SPECTRUM OF CARBON MONOSULFIDE

338. Y.MORINO AND E.HIROTA,J.CHEM.PHYS.23,737-747(1955) MEAN AMPLITUDES OF THERMAL VIBRATIONS IN POLYATOMIC MOLECULES. III. THE GENERALIZED MEAN AMPLITUDES

339. T.NISHIKAWA ,T.ITOH,AND K.SHIMODA,J.CHEM.PHYS.23,1735-1736(1955) MOLECULAR STRUCTURE OF METHYLAMINE FROM ITS MICROWAVE SPECTRUM

340. D.W.POSENER,J.CHEM.PHYS.23,1728-1729(1955) NOTE ON THE X-BAND MICROWAVE SPECTRUM OF HEAVY WATER

341. B.ROSENBLUM AND A.H.NETHERCOT,JR.,PHYS.REV.97,84-85(1955) MICROWAVE SPECTRA OF TRITIUM IODIDE AND TRITIUM BROMIDE

342. N.SOLIMENE AND B.P.DAILEY,J.CHEM.PHYS.23,124-129(1955) STRUCTURE AND BARRIER HEIGHT OF METHYL MERCAPTAN FROM MICROWAVE DATA

343. L.F.THOMAS,E.I.SHERRARD,AND J.SHERIDAN,TRANS.FARADAY SOC.51,619-625 (1955) MICROWAVE SPECTRA OF SOME PARTIALLY DEUTERIATED METHYL DERIVATIVES. I. METHYL CYANIDE AND METHYL ACETYLENE

344. K.TSUKADA,J.PHYS.SOC.JAPAN 10,60-64(1955) MICROWAVE SPECTRA OF SPCL3,EXPERIMENTAL

345. T.E.TURNER,V.C.FIORA,AND W.M.KENDRICK,J.CHEM.PHYS.23,1966(1955) MICROWAVE SPECTRUM OF IMINE-DEUTERIATED ETHYLENIMINE

346. P.VENKATESWARLU,H.D.EDWARDS,AND W.GORDY,J.CHEM.PHYS.23,1195-1199 (1955) METHYL ALCOHOL I.MICROWAVE SPECTRUM

347. P.VENKATESWARLU,H.D.EDWARDS,AND W.GORDY,J.CHEM.PHYS.23,1200-1202 (1955) METHYL ALCOHOL. II. MOLECULAR STRUCTURE

348. R.S.WAGNER,N.SOLIMENE,AND B.P.DAILEY,J.CHEM.PHYS.23,599(1955) MICROWAVE SPECTRUM OF ETHYL BROMIDE

349. S.WEISBAUM,Y.BEERS,AND G.HERRMANN,J.CHEM.PHYS.23,1601-1605(1955) LOW FREQUENCY ROTATIONAL SPECTRUM OF HDO

350. Q.WILLIAMS AND T.L.WEATHERLY,PHYS.REV.98,1159(1955) THE MICROWAVE SPECTRUM OF NITROSYL BROMIDE

351. F.A.ANDERSEN,B.BAK,AND S.BRODERSEN,J.CHEM.PHYS.24,989-992(1956) NORMAL VIBRATION FREQUENCIES OF CD3F. STRUCTURE OF CH3F AND CD3F FROM INFRARED AND MICROWAVE SPECTRA

352. B.BAK,D.CHRISTENSEN,L.HANSEN,AND J.RASTRUP-ANDERSEN,J.CHEM.PHYS.24, 720-725(1956) MICROWAVE DETERMINATION OF THE STRUCTURE OF PYRROLE

353. B.BAK,D.CHRISTENSEN,J.RASTRUP-ANDERSEN,AND E.TANNENBAUM,J.CHEM.

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354. A.I.BARCHUKOV,T.M.MIKAEVA,AND A.M.PROKHOROV,SOVIET PHYS.JETP 2, 760(1956) MICROWAVE ROTATION SPECTRUM OF THE ETHYL CHLORIDE MOLECULE

355. G.R.BIRD,J.CHEM.PHYS.25,1040-1043(1956) MICROWAVE SPECTRUM OF NO2- A RIGID ROTOR ANALYSIS

356. G.ERLANDSSON,J.CHEM.PHYS.25,379(1956) MILLIMETER WAVE SPECTRUM OF FORMIC ACID

357. G.ERLANDSSON,J.CHEM.PHYS.25,579-580(1956) MILLIMETER WAVE SPECTRUM OF FORMALDEHYDE

358. G.ERLANDSSON AND J.COX,J.CHEM.PHYS.25,778-779(1956) MILLIMETER WAVE LINES OF HEAVY WATER

359. H.G.FITZKY AND H.HAPP,Z.NATURFORSCH 11A,957-958(1956) THE MICROWAVE SPECTRUM OF METHYL ALCOHOL

360. H.HIRAKAWA,A.MIYAHARA,AND K.SHIMODA,J.PHYS.SOC.JAPAN 11,334-335(1956) MICROWAVE SPECTRA OF FORMALDEHYDE AND METHYL AMINE IN THE SUPERHIGH-FREQUENCY REGION

361. H.HIRAKAWA,T.OKA,AND K.SHIMODA,J.PHYS.SOC.JAPAN 11,1207(1956) MICROWAVE SPECTRA OF HCHO-D1,D2

362. R.H.HUGHES,J.CHEM.PHYS.24,131-138(1956) STRUCTURE OF OZONE FROM THE MICROWAVE SPECTRUM BETWEEN 9000 AND 45000 MC/SEC

363. A.W.JACHE,P.W.MOSER,AND W.GORDY,J.CHEM.PHYS.25,209-210(1956) MILLIMETER WAVE SPECTRUM ,MOLECULAR STRUCTURE,AND DIPOLE MOMENT OF HYDROGEN SELENIDE

364. N.KWAK,J.H.GOLDSTEIN,AND J.W.SIMMONS,J.CHEM.PHYS.25,1203-1205(1956) MICROWAVE SPECTRUM OF BETA-PROPIOLACTONE

365. V.W.LAURIE,J.CHEM.PHYS.24,635-636(1956) MICROWAVE SPECTRUM AND AND DIPOLE MOMENT OF CYCLOPENTADIENE

366. A.A.MARYOTT AND G.BIRNBAUM,J.CHEM.PHYS.24,1022-1026(1956) MICROWAVE ABSORPTION IN COMPRESSED GASES-SATURATED HYDROCARBONS

367. D.J.MILLEN AND J.R.MORTON,CHEMISTRY AND INDUSTRY 1956,954(1956) MICROWAVE SPECTRUM,STRUCTURE,AND DIPOLE MOMENT OF NITRIC ACID

368. A.OKAYA,J.PHYS.SOC.JAPAN 11,258-263(1956) MICROWAVE HYPERFINE SPECTRUM OF FORMALDEHYDE

369. J.F.OLLOM,A.A.SINISGALLI,H.N.REXROAD,AND R.C.GUNTON,J.CHEM.PHYS.24, 487-488(1956) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF (CH3)3SIBR

370. H.N.REXROAD,D.W.HOWGATE,R.C.GUNTON,AND J.F.OLLOM,J.CHEM.PHYS.24, 625(1956) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF (CH3)3SII

371. P.SWARUP,Z.PHYSIK 144,632-636(1956) ABSORPTION AND DISPERSION OF MICROWAVES IN METHYL BROMIDE

372. P.SWARUP,PHYS.REV.104,89-90(1956) DISPERSION OF MICROWAVES IN ND3

373. V.G.VESELAGO AND A.M.PROKHOROV,ZHUR.EKSPTL.I.TEORET,FIZ.31,731(1956) THE HDSE MICROWAVE SPECTRUM

374. T.L.WEATHERLY AND Q.WILLIAMS,J.CHEM.PHYS.25.717-721(1956) MICROWAVE SPECTRUM AND MOLECULAR CONSTANTS OF NITROSYL BROMIDE

375. R.WERTHEIMER,COMPT.REND.242,243-244(1956) ABSORPTION SPECTRUM OF FORMIC ACID VAPOR IN THE VICINITY OF 3 MM.

376. R.WERTHEIMER,ARCH.SCI.(GENEVA)9,47-48(1956) ABSORPTION SPECTRUM OF FORMIC ACID VAPOR BETWEEN THE WAVELENGTHS OF 4.5 AND 2.5 MM

377. R.WERTHEIMER,COMPT.REND.242,1591-1593(1956) THE ROTATIONAL SPECTRUM AND INERTIAL CONSTANTS OF THE FORMIC ACID MOLECULE

378. P.N.WOLFE,J.CHEM.PHYS.25,976-981(1956) MICROWAVE SPECTRUM OF CHLOROFORM

379. L.YARMUS,PHYS.REV.104,365-367(1956) HYPERFINE STRUCTURE IN THE L-TYPE DOUBLING SPECTRUM OF HYDROGEN CYANIDE

380. W.ZEIL,Z.ELEKTROCHEM.60,752-755(1956) THE MICROWAVE SPECTRUM OF TRICHLOROACETONITRILE AND OF 1,1,1-TRICHLOROETHANE FROM 23,500 TO 25,500 MC
ERRATA-Z.ELEKTROCHEM.60,1204(1956)

381. W.ZEIL,Z.NATURFORSCH 11A,677-678(1956) THE MICROWAVE SPECTRUM OF 1,1,1 TRICHLOROETHANE

382. B.BAK,D.CHRISTENSEN,L.HANSEN-NYGAARD,AND E.TANNENBAUM,J.CHEM.PHYS. 26,134-137(1957) MICROWAVE DETERMINATION OF THE STRUCTURE OF FLUOROBENZENE

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385. H.H.BLAU,JR.AND H.H.NIELSEN,J.MOL.SPECTRY.1,124-132(1957) INFRARED ABSORPTION SPECTRUM OF FORMALDEHYDE VAPOR

386. C.A.BURRUS AND W.GORDY,J.CHEM.PHYS.26,391-394(1957) SPECTRA OF SOME SYMMETRIC TOP MOLECULES IN THE ONE-TO -FOUR MILLIMETER WAVE REGION

387. W.F.EDGELL,P.A.KINSEY,AND J.W.AMY,J.AM.CHEM.SOC.79,2691-2693(1957) THE MICROWAVE SPECTRA AND STRUCTURE OF CF2=CH2,CF2=CHD,AND CF2=CD2

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389. P.GOEDERTIER AND K.L.LEE,ANN.SOC.SCI.BRUXELLES 71,128-133(1957) PURE ROTATION SPECTRA OF LIGHT AND HEAVY VINYL BROMIDE BY MICROWAVE METHOD

390. P.GOEDERTIER AND K.L.LEE,ANN.SOC.SCI.BRUXELLES 71,184-188(1957) PURE ROTATION SPECTRA OF VINYL BROMIDE

391. H.HAPP,Z.PHYSIK 147,567-572(1957) MICROWAVE SPECTRUM OF THALLIUM(I) IODIDE AND BISMUTH CHLORIDE IN THE 3 CM AND 1.5 CM BAND

392. T.KOJIMA AND T.NISHIKAWA,J.PHYS.SOC.JAPAN 12,680-686(1957) POTENTIAL BARRIER AND MOLECULAR STRUCTURE OF METHYL MERCAPTAN FROM ITS MICROWAVE SPECTRA

393. KRISHNAJI AND G.P.SRIVASTAVA,PHYS.REV.106,1186-1189(1957) MICROWAVE ABSORPTION IN ETHYL CHLORIDE

394. R.J.KURLAND AND E.B.WILSON,JR.,J.CHEM.PHYS.27,585-590(1957) MICROWAVE SPECTRUM ,STRUCTURE,DIPOLE MOMENT,AND QUADRUPOLE COUPLING CONSTANTS OF FORMAMIDE

395. V.W.LAURIE,J.CHEM.PHYS.26,1359-1362(1957) MICROWAVE SPECTRUM, DIPOLE MOMENT,AND STRUCTURE OF DIFLUOROSILANE

396. R.G.LERNER AND B.P.DAILEY,J.CHEM.PHYS.26,678-680(1957) MICROWAVE SPECTRUM AND STRUCTURE OF PROPIONITRILE

397. R.G.LERNER ,B.P.DAILEY,AND J.P.FRIEND,J.CHEM.PHYS.26,680-683(1957) MICROWAVE SPECTRUM AND STRUCTURE OF FORMIC ACID

398. D.R.LIDE,JR.,D.E.MANN, AND R.M.FRISTROM,J.CHEM.PHYS.26,734-739(1957) MICROWAVE SPECTRUM AND STRUCTURE OF SULFURYL FLUORIDE

399. D.W.MAGNUSON,J.CHEM.PHYS.27,223-226(1957) MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF BROMINE TRIFLUORIDE

400. K.MATSUURA,Y.SUGIURA,AND G.M.HATOYAMA,PHYS.REV.106,607(1957) FREQUENCY OF THE AMMONIA (3,3) LINE

401. I.A.MUKHTAROV,SOVIET PHYSICS-DOKLADY-2,357-358(1957) MICROWAVE SPECTRA OF 1,2-FLUOROCHLOROETHANE

402. B.D.OSIPOV,OPTIKA I SPEKTROSKOPIYA 3,94-95(1957) HYPERFINE STRUCTURE OF ROTATIONAL TRANSITION J=3→4 OF THE MEI(127) MOLECULE

403. E.D.PALIK AND E.E.BELL,J.CHEM.PHYS.26,1093-1101(1957) PURE ROTATIONAL SPECTRA OF THE PARTIALLY DEUTERATED AMMONIAS IN THE FAR INFRARED SPECTRAL REGION

404. S.SEKINO AND T.NISHIKAWA,J.PHYS.SOC.JAPAN 12,43-48(1957) MICROWAVE SPECTRUM OF VINYLIDENE CHLORIDE

405. H.SELEN,ARKIV. FYSIK 13,81-83(1957) MICROWAVE SPECTRUM OF CHLOROBENZENE

406. K.SHIMODA,J.PHYS.SOC.JAPAN 12,558(1957) PRECISE FREQUENCY OF THE 3,3 INVERSION LINE OF NH3

407. T.SPARSTAD AND E.AMBLE,J.CHEM.PHYS.27,317(1957) MICROWAVE SPECTRUM AND STRUCTURE OF (CH3)3CCN

408. L.F.THOMAS,J.S.HEEKS,AND J.SHERIDAN,Z.ELEKTROCHEM.61,935-937(1957) MICROWAVE SPECTRA OF SOME MOLECULES CONTAINING -CF3 AND SIF3 GROUPS

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410. R.S.WAGNER AND B.P.DAILEY,J.CHEM.PHYS.26,1588-1593(1957) MICROWAVE SPECTRUM OF ETHYL CHLORIDE

411. R.S.WAGNER,B.P.DAILEY,AND N.SOLIMENE,J.CHEM.PHYS.26,1593-1596(1957) MICROWAVE SPECTRUM OF ETHYL BROMIDE

412. R.WAGNER,J.FINE,J.W.SIMMONS,AND J.H.GOLDSTEIN,J.CHEM.PHYS.26, 634-637(1957) MICROWAVE SPECTRUM,STRUCTURE,AND DIPOLE MOMENT OF S-TRANS-ACROLEIN

413. R.WERTHEIMER,ARCH.SCI.(GENEVA)10,184-186(1957) MOLECULAR CONSTANTS OF FORMIC ACID FROM THE ROTATIONAL SPECTRUM

414. R.WERTHEIMER AND M.CLOUARD,COMPT.REND.245,1793-1794(1957) ABSORPTION OF SULFUROUS ANHYDRIDE(SO2) IN THE MILLIMETER WAVE REGION

415. B.BAK,D.CHRISTENSEN,L.HANSEN-NYGAARD,AND J.RASTRUP-ANDERSEN, SPECTROCHIM.ACTA 13,120-124(1958) THE STRUCTURE OF VINYL FLUORIDE

416. B.BAK,L.HANSEN-NYGAARD,AND J.RASTRUP-ANDERSEN,J.MOL.SPECTRY.2,54-57 (1958) THE STRUCTURE OF TERTIARY BUTYL ISOCYANIDE

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418. A.I.BARCHUKOV AND N.G.BASOV,OPTIKA I SPEKTROSKOPIYA 4,532(1958) FREQUENCIES AND INTENSITIES OF HYPERFINE STRUCTURE LINES OF CH3I (THE TRANSITION I=0-1)

419. A.I.BARCHUKOV,T.M.MURINE,AND A.M.PROKHOROV,OPTIKA I SPEKTROSKOPIYA 4,521-523(1958) MICROWAVE SPECTRUM AND ROTATION CONSTANTS OF ETHYL CHLORIDE MOLECULE

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421. A.I.BARCHUKOV AND A.M.PROKHOROV,OPTIKA I SPEKTROSKOPIYA 4,799(1958) MICROWAVE SPECTRUM OF CH3GEH3

422. A.H.BARRETT AND M.MANDEL,PHYS.REV.109,1572-1589(1958) MICROWAVE SPECTRA OF THALLIUM,INDIUM,AND GALLIUM MONOHALIDES

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425. A.P.COX,L.F.THOMAS,AND J.SHERIDAN,NATURE 181,1157-1158(1958) MICROWAVE SPECTRUM OF NICKEL CYCLOPENTADIENYL NITROSYL AND THE CONFIGURATION OF THE MOLECULE

426. C.W.N.CUMPER,TRANS.FARADAY SOC.54,1266-1270(1958) STRUCTURE OF SOME HETEROCYCLIC MOLECULES

427. G.ERLANDSSON,J.CHEM.PHYS.28,71-75(1958) MILLIMETER WAVE SPECTRUM OF FORMIC ACID

428. G.ERLANDSSON AND H.SELEN,ARKIV FYSIK 14,61-64(1958) DIPOLE MOMENT OF FORMIC ACID

429. J.P.FRIEND AND B.P.DAILEY,J.CHEM.PHYS.29,577-582(1958) MICROWAVE STUDIES OF THE STRUCTURE OF CYCLOPROPYL DERIVATIVES

430. H.G.FRITZKY,Z.PHYSIK 151,351-364(1958) THE MICROWAVE ROTATION SPECTRUM OF THALLIUM(I) HALIDES

431. E.HIROTA,J.CHEM.PHYS.28,839-846(1958) ROTATIONAL STRUCTURE OF THE INFRARED ABSORPTION SPECTRUM OF HYDROGEN PEROXIDE VAPOR

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435. KRISHNAJI AND G.P.SRIVASTAVA,PHYS.REV.109,1560-1563(1958) MICROWAVE ABSORPTION IN METHYL HALIDES

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439. L.PIERCE,J.CHEM.PHYS.29,383-388(1958) MICROWAVE SPECTRUM, INTERNAL BARRIER,STRUCTURE,EQUILIBRIUM CONFORMATION,AND DIPOLE MOMENT OF METHYL MONOFLUOROSILANE

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442. J.D.SWALEN AND B.P.STOICHEFF,J.CHEM.PHYS.28,671-674(1958) MICROWAVE SPECTRUM OF METHYL DIFLUOROSILANE

443. R.TRAMBARULO,A.CLARK,AND C.HEARNS,J.CHEM.PHYS.28,736-737(1958) PLANARITY OF THE FORMIC ACID MONOMER

444. V.G.VESELAGO,IZVEST.AKAD.NAUK SSSR SER.FIZ.22,1150-1153(1958) DETERMINATION OF THE STRUCTURE OF THE HDSE MOLECULE FROM THE ROTATIONAL MICROWAVE SPECTRUM

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455. K.E.GORA,J.MOL.SPECTRY 3,78-99(1959) THE ROTATIONAL SPECTRUM OF OZONE

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459. P.G.KOKERITZ AND H.SELEN,ARKIV FYSIK 16,197-198(1959) MICROWAVE SPECTRUM AND ELECTRIC DIPOLE MOMENT OF CYCLOPENTANONE

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463. D.R.LIDE,JR.,SPECTROCHIM.ACTA 15,473-476(1959) MICROWAVE SPECTRUM OF TRIMETHYLARSINE

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616. D.R.LIDE,JR.,J.CHEM.PHYS.38,2027(1963) MICROWAVE SPECTRUM OF ALUMINUM MONOFLUORIDE

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619. I.A.MUKHTAROV,OPTIKA I SPEKTROSKOPIYA 15,563-564(1963) MICROWAVE SPECTRUM OF CF2=CHF

620. I.A.MUKHTAROV,DOKL.AKAD.NAUK SSSR 151,1076-1078(1963) MICROWAVE SPECTRUM OF THE F2HC-CH2F MOLECULE

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13-GO(TRINADTSATOGO)SOVESHCH.,LENINGRAD,1960 2,85-87(1963)
THE MICROWAVE SPECTRUM OF TRIFLUOROETHANE

622. R.NELSON,J.CHEM.PHYS.39,2382-2383(1963) MICROWAVE SPECTRUM, MOLECULAR STRUCTURE,AND DIPOLE MOMENT OF DIMETHYLPHOSPHINE

623. E.W.NEUVAR AND A.W.JACHE,J.CHEM.PHYS.39,596-599(1963) MICROWAVE SPECTRUM AND STRUCTURE OF PENTAFLUOROSULFUR BROMIDE

624. R.L.POYNTER,J.CHEM.PHYS.39,1962-1966(1963) MICROWAVE SPECTRUM, QUADRUPOLE COUPLING CONSTANTS,AND DIPOLE MOMENT OF CHLOROBENZENE

625. T.N.SARACHMAN,J.CHEM.PHYS.39,469-473(1963) MICROWAVE SPECTRUM OF NORMAL PROPYL CHLORIDE

626. L.H.SCHARPEN AND V.W.LAURIE,J.CHEM.PHYS.39,1732-1733(1963) STRUCTURE OF ISOBUTYLENE

627. T.SHIGENARI,S.KOBAYASHI,AND H.TAKUMA,J.PHYS.SOC.JAPAN 18,312-313 (1963) (6.3)ROTATIONAL SPECTRUM OF FORMALDEHYDE BY A RADIO-FREQUENCY BEAM-TYPE MASER

628. K.K.SVIDZINSKII,FIZ.PROBL.SPEKTROSKOPII,AKAD.NAUK SSSR,MATERIALY 13-GO(TRINADTSATOGO)SOVESHCH.,LENINGRAD,1960 2,83-85(1963) CALCULATION OF THE HYPERFINE STRUCTURE OF THE INVERSION SPECTRA OF THE ND3 MOLECULE

629. K.TAKAGI AND T.OKA,J.PHYS.SOC.JAPAN 18,1174-1180(1963) MILLIMETER WAVE SPECTRUM OF FORMALDEHYDE

630. K.TAKAGI AND S.SAITO,J.PHYS.SOC.JAPAN 18,1840(1963) MILLIMETER WAVE SPECTRUM OF SO2

631. J.K.TYLER,J.MOL.SPECTRY.11,39-46(1963) MICROWAVE SPECTRUM OF NITRAMIDE

632. J.K.TYLER AND J.SHERIDAN,TRANS.FARADAY SOC.59,2661-2670(1963) STRUCTURAL STUDIES OF LINEAR MOLECULES BY MICROWAVE SPECTROSCOPY

633. R.VAN RIET,ANN.SOC.SCI.BRUXELLES 77,18-29(1963) ROTATIONAL SPECTRUM OF THE S(34)O2 MOLECULE IN THE FIRST VIBRATIONAL EXCITED STATE (12,800-30,000 MC.) AND COMPLIMENTARY STUDY OF THE S(32)O2 AND S(33)O2 MOLECULES IN THE RANGE 25,000-27,500 MC.

634. L.WHARTON AND W.KLEMPERER,J.CHEM.PHYS.38,2705-2708(1963) MICROWAVE SPECTRUM OF BAO

635. L.WHARTON,W.KLEMPERER,L.P.GOLD,R.STRAUCH,J.J.GALLAGHER,AND V.E.DERR, J.CHEM.PHYS.38,1203-1210(1963) MICROWAVE SPECTRUM,SPECTROSCOPIC CONSTANTS,AND ELECTRIC DIPOLE MOMENT OF LI(6)F(19)

636. A.YARIV AND J.P.GORDON,PROC.IEEE 51,4-29(1963) THE LASER

637. A.BAUER AND J.BELLET,J.PHYS.(PARIS)25,805-808(1964) ROTATION SPECTRA OF SO2 IN THE MILLIMETER REGION

638. A.BAUER AND J.BELLET,COMPT.REND.258,873-876(1964) ROTATION SPECTRUM OF SO2 IN MILLIMETER WAVELENGTHS(6 MM. AND 2.2 MM.)

639. R.A.BEAUDET,J.CHEM.PHYS.40,2705-2715(1964) MICROWAVE SPECTRUM, BARRIER TO INTERNAL ROTATION,AND QUADRUPOLE COUPLING CONSTANTS OF CIS-1-CHLOROPROPYLENE

640. S.S.BUTCHER AND E.B.WILSON,JR.,J.CHEM.PHYS.40,1671-1677(1964) MICROWAVE SPECTRUM OF PROPIONALDEHYDE

641. C.C.COSTAIN AND G.P.SRIVASTAVA,J.CHEM.PHYS.41,1620-1627(1964) MICROWAVE ROTATION SPECTRA OF HYDROGEN-BONDED MOLECULES

642. P.A.CURNUCK AND J.SHERIDAN,NATURE 202,591-592(1964) MICROWAVE SPECTRUM OF FLUOROBROMOETHANE

643. L.ESTEROWITZ AND J.ROSENTHAL,J.CHEM.PHYS.40,1986-1987(1964) DIPOLE MOMENT OF N(15)O(16)2

644. A.J.HEBERT,F.W.BREIVOGEL,JR.,AND K.STREET,JR.,J.CHEM.PHYS.41, 2368-2376(1964) RADIO-FREQUENCY AND MICROWAVE SPECTRA OF LIBR BY THE MOLECULAR-BEAM ELECTRIC-RESONANCE METHOD

645. C.D.HOLLOWELL,A.J.HEBERT,AND K.STREET,JR.,J.CHEM.PHYS.41,3540-3545 (1964) RADIO-FREQUENCY AND MICROWAVE SPECTRA OF NAF BY THE MOLECULAR BEAM ELECTRIC-RESONANCE METHOD

646. L.M.IMANOV,A.A.ABDURAKHMANOV,AND R.A.RAGIMOVA,OPTIKA I SPEKTROSKOPIYA 17,306-307(1964) MICROWAVE SPECTRUM AND EFFECTIVE ROTATIONAL CONSTANTS OF THE CD3CH2OH MOLECULE

647. G.JONES AND W.GORDY,PHYS.REV.135,295-296(1964) EXTENSION OF SUBMILLIMETER WAVE SPECTROSCOPY BELOW A HALF MILLIMETER WAVELENGTH

648. G.JONES AND W.GORDY,PHYS.REV.136,1229-1232(1964) SUBMILLIMETER-WAVE SPECTRA OF HCL AND HBR

649. R.KEWLEY,K.V.L.N.SASTRY,AND M.WINNEWISSER,J.MOL.SPECTRY.12,387-401 (1964) MICROWAVE AND MILLIMETER WAVE SPECTRA OF HYDRAZOIC ACID

650. W.J.LAFFERTY AND D.R.LIDE,JR.,J.MOL.SPECTRY 14,407-408(1964) ROTATIONAL CONSTANTS OF EXCITED VIBRATIONAL STATES OF N(14)2O(16)

651. D.R.LIDE,JR.,PROC.MEETING INTERAGENCY CHEM.ROCKET PROPULSION GROUP THERMOCHEM.,1ST,NEW YORK,1963 1,1-2(1964) RECENT MICROWAVE SPECTRAL STUDIES OF HIGH-TEMPERATURE SPECIES

652. D.R.LIDE,JR.,P.CAHILL,AND L.P.GOLD,J.CHEM.PHYS.40,156-159(1964) MICROWAVE SPECTRUM OF LITHIUM CHLORIDE

653. D.R.LIDE,JR. AND M.JEN,J.CHEM.PHYS.40,252-253(1964) MICROWAVE STUDIES OF BUTADIENE DERIVATIVES II. ISOPRENE

654. J.MARTINS AND E.B.WILSON,JR.,J.CHEM.PHYS.41,570-571(1964) MICROWAVE SPECTRUM OF XENON OXYTETRAFLUORIDE

655. D.B.MCLAY,CAN.J.PHYS.42,720-730(1964) MICROWAVE SPECTRUM OF DICHLOROFLUOROETHANE

656. Y.MORINO,Y.KIKUCHI,S.SAITO,AND E.HIROTA,J.MOL.SPECTRY.13,95-118 (1964) EQUILIBRIUM STRUCTURE AND POTENTIAL FUNCTION OF SULFUR DIOXIDE FROM THE MICROWAVE SPECTRUM IN THE EXCITED

VIBRATIONAL STATE

657. I.A.MUKHTAROV,OPTIKA I SPEKTROSKOPIYA 16,360(1964) MICROWAVE SPECTRUM OF THE MOLECULE F2DCCD2F

658. T.OKA,K.TAKAGI,AND Y.MORINO,J.MOL.SPECTRY.14,27-52(1964) MICROWAVE SPECTRUM OF FORMALDEHYDE IN VIBRATIONALLY EXCITED STATES

659. T.OKA,K.TSUCHIYA,S.IWATA,AND Y.MORINO,BULL.CHEM.SOC.JAPAN 37,4-7 (1964) MICROWAVE SPECTRUM OF S-TRIOXANE

660. H.E.RADFORD,J.CHEM.PHYS.40,2732-2733(1964) SYNTHESIS OF DIATOMIC MOLECULES

661. V.M.RAO AND R.F.CURL,JR.,J.CHEM.PHYS.40,3688-3690(1964) MICROWAVE SPECTRUM OF VINYL FORMATE

662. J.S.RIGDEN AND S.S.BUTCHER,J.CHEM.PHYS.40,2109-2114(1964) MICROWAVE SPECTRUM OF METHYL HYPOCHLORITE

663. K.V.L.N.SASTRY AND R.F.CURL,JR.,J.CHEM.PHYS.41,77-80(1964) MICROWAVE SPECTRUM OF N-METHYL METHYLENIMINE

664. R.H.SCHWENDEMAN,G.D.JACOBS,AND T.M.KRIGAS,J.CHEM.PHYS.40,1022-1028 (1964) MOLECULAR STRUCTURE OF CYCLOPROPYLCHLORIDE

665. G.P.SRIVASTAVA,PHYSICA 30,1913-1916(1964) MICROWAVE SPECTRUM OF MONOFLUORO ACETIC ACID

666. F.L.TOBIASON AND R.H.SCHWENDEMAN,J.CHEM.PHYS.40,1014-1021(1964) MICROWAVE SPECTRUM,MOLECULAR STRUCTURE,AND QUADRUPOLE COUPLING CONSTANTS OF 2-CHLOROPROPANE

667. J.K.TYLER,J.CHEM.PHYS.40,1170-1171(1964) MICROWAVE SPECTRUM OF METHINOPHOSPHIDE,HCP

668. M.WINNEWISSER,K.V.L.N.SASTRY,R.L.COOK ,AND W.GORDY,J.CHEM.PHYS.41, 1687-1691(1964) MILLIMETER WAVE SPECTROSCOPY OF UNSTABLE MOLECULAR SPECIES. II. SULFUR MONOXIDE

669. D.R.LIDE,JR.,D.E.MANN AND J.J.COMEFORD,SPECTROCHIM.ACTA 21,497-501 (1965) THE VIBRATIONAL ASSIGNMENT OF SULFURYL FLUORIDE

670. V.M.RAO,J.T.YARDLEY,AND R.F.CURL,JR.,J.CHEM.PHYS.42,284-288(1965) MICROWAVE SPECTRUM OF METHYL THIONYLAMINE