RECLASSIFICATION OF MATERIALS
LISTED AS TRANSPORTATION HEALTH HAZARDS

K.C. Back
A.A. Thomas
J.D. MacEwen

6570th Aerospace Medical Research Laboratory (AFSC)
Wright-Patterson Air Force Base, Ohio

AUGUST 1972
FINAL REPORT

Prepared for
DEPARTMENT OF TRANSPORTATION
OFFICE OF THE ASSISTANT SECRETARY
FOR SAFETY AND CONSUMER AFFAIRS
Office of Hazardous Materials
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16. Abstract
This study was performed to provide technical background and recommendations for assisting the Department of Transportation in considering a revised health hazards classification system. The study consisted of three phases. Phase I—An extensive literature search was conducted for pertinent human and acute animal toxicity data for about 200 materials, classed as Poison A, B or C in the Commodity List, Section 172.5, Title 49 CFR, and/or as Toxic (Class 6.1) in the Subsidiary Risk Category in the United Nations publication, Volume I, Transportation of Dangerous Goods, 1966. Materials were classified according to the proposed classification criteria, if valid data were adequate for evaluation. Tests were recommended for the materials for which data were missing or inadequate. Phase II—Inhalation (LC$_{50}$) toxicity tests were run on mice and rats for five materials and oral toxicity (LD$_{50}$) tests were run on mice and rats for 40 other materials. The phosphine evolution rate for aluminum phosphide in air (55% relative humidity) and in water were determined. The results have been summarized and the materials classified. Phase III—Verification inhalation toxicity (LC$_{50}$) tests were run on mice and rats exposed to chlorine, anhydrous ammonia and hydrogen sulfide. Results have been included and reflected in the classification of these materials. One other material was classified from literature data.  

17. Key Words
Toxicity, hazard, classification, inhalation toxicity, LC$_{50}$, LD$_{50}$, transportation, poison, PPM, mg/M$^3$, oral toxicity  

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INTRODUCTION

Comments on Consolidation of Literature and Testing Data

This final report, as initially prepared by the Air Force, was just for Phase I, which consisted of searching and evaluating literature data. Also, tests were recommended for specific materials for which data were considered insufficient. The draft Phase I final report generally listed inhalation data in parts per million (ppm), although for some liquids values were reported in milligrams per liter (mg/L). The Phase I finished report presented all inhalation data in milligrams per cubic meter (mg/M³).

Conversion to ppm was necessary to have units consistent with CFR, Title 49 - Transportation, and CFR, Title 21 - Food and Drug classification criteria. Conversion values were provided by the Air Force for data sheets through 198. Subsequent ones were calculated by the sponsor using the formula:

\[ \text{PPM (by volume)} = \frac{24.50 \times \text{mg/M}^3}{\text{Molecular Wt.}} \]

The advantage of including the Air Force toxicity testing data from Phases II and III, to have all the information in one document, seemed obvious. This consolidation was accomplished by the Technology Division, Office of Hazardous Materials (OHM). OHM confined its editing to consolidating the information provided on Phases I, II and III work.

Phase I--Literature Search and Evaluation

An extensive literature search was conducted to obtain human and animal acute toxicity data pertinent for the evaluation of the toxic hazard classification of 200 chemical materials. These were materials classed as poisons A, B or C in the "Commodity List, Section 172.5, Title 49 CFR," and those listed as toxic (Class 6.1) in the subsidiary risk (column 3) in the United Nations Publication "Volume I, Transportation of Dangerous Goods, 1966." These materials were reclassified as requested by the Department of Transportation according to the "Extremely Toxic" and "Highly Toxic" criteria shown in the Second Advance Notice of Proposed Rule Making, Docket No. HM-51 (36 F.R. 2934), published February 12, 1971.

The classifications assigned are not official regulatory classifications and are presented for technical information only. Whenever available, valid human toxicity data were given precedence over all animal data for determination of the toxicity classification.
A third classification of "Toxic" was used for some of those materials that did not fall in the above "Extremely Toxic" or "Highly Toxic" catagories, but for which adequate data was available for categorization. During the course of the evaluation of toxicity data and assignment of classifications, we became aware that a number of very hazardous materials were based strictly upon the numerical criteria in Docket No. HM-51. We were concerned that users of the proposed revised commodity list would misinterpret the lack of classification as meaning nontoxic.

Most of these materials are toxic and, therefore, we have classified them for consideration by the Department of Transportation.

The "Toxic" category is a direct downward extension of the acute LC50 and LD50 levels used in the "Extremely Toxic" and "Highly Toxic" levels, mentioned previously. It corresponds to the "Toxic Substances" category found in Section 191.1, Title 21 Food and Drug, CFR, Revised as of January 1, 1970.

Among the materials which fell into the "Toxic" category are carbon monoxide, carbon disulphide and anhydrous ammonia. These materials are extremely hazardous in acute exposures because of lack of warning powers or because they produce an impaired ability for self-rescue in man. The high hazard of these materials requires some classification which does not permit careless treatment of accidental spills. The classification system used is shown below:

<table>
<thead>
<tr>
<th>Extremely Toxic</th>
<th>Highly Toxic</th>
<th>Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation 1 Hour LC50</td>
<td>50 ppm or less (0.5 mg/L or less)</td>
<td>50-200 ppm (0.5-2 mg/L)</td>
</tr>
<tr>
<td>Oral 14-Day Single Dose LD50</td>
<td>5 mg/Kg or less</td>
<td>5-50 mg/Kg</td>
</tr>
<tr>
<td>Skin Absorption (Dermal) LD50</td>
<td>20 mg/Kg or less</td>
<td>20-200 mg/Kg</td>
</tr>
</tbody>
</table>

I/ Applies to dusts and mists. Mg/M^3 = 1000 x mg/L.
Since the new classifications were based solely on acute toxicity, all forms of a material (concentrates, solutions, mixtures, etc.) have been assigned to the same toxicity categories regardless of concentration of the active ingredients. No consideration was given to hazard potential of the materials reclassified.

Tables I and II list the materials from the two sources with their new classifications or the information needed to allow reclassification. The classification based upon inhalation toxicity, assigned several commodities, is higher than strict adherence to the PPM criteria on page 2 would indicate. This represents a professional judgment by the authors. The code numbers assigned to the chemicals reviewed were for our convenience only and were usually given to only the first form of a compound listed. For many materials we were unable to find suitable information for classification either because toxicity studies had not been performed, or existing data were not adequate to estimate the $LD_{50}$ or $LC_{50}$. The last column in Tables I and II identifies the information needed to classify these materials.

We do not recommend research on every material that could not be reclassified. Acute toxicity studies should be conducted on representative arsenical and mercurial compounds and, if similar toxicity is found, the list should be modified to combine them as one class for toxicity rating rather than listing individual compounds. (A number of materials were subsequently tested as shown in Tables III and IV.)

All materials that were classified, toxicity data, references used, and justification for classification are presented on individual sheets, found in Appendix A and are identified by name and code number. On the individual data sheets various systems for expression of toxicity are used. These system abbreviations are defined by the original authors of the research data as follows:
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALC</td>
<td>Approximate lethal concentration</td>
</tr>
<tr>
<td>ALC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Approximate lethal concentration for 50% or 100% of animals exposed</td>
</tr>
<tr>
<td>ALC&lt;sub&gt;100&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>ALD</td>
<td>Approximate lethal dose</td>
</tr>
<tr>
<td>ALD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Approximate lethal dose for 50, 85 or 100% of animals used</td>
</tr>
<tr>
<td>ALD&lt;sub&gt;85&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>ALD&lt;sub&gt;100&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Statistically derived lethal concentration for 50, 80 or 100% of animals exposed</td>
</tr>
<tr>
<td>LC&lt;sub&gt;80&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>LC&lt;sub&gt;100&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>LD</td>
<td>Lethal dose</td>
</tr>
<tr>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Statistically derived lethal dose for 50 or 100% of animals tested</td>
</tr>
<tr>
<td>LD&lt;sub&gt;100&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>MFD</td>
<td>Minimum fatal dose</td>
</tr>
<tr>
<td>MLC</td>
<td>Minimum lethal concentration</td>
</tr>
<tr>
<td>MLD</td>
<td>Minimum lethal dose</td>
</tr>
<tr>
<td>MLD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Median lethal dose</td>
</tr>
<tr>
<td>Intolerable</td>
<td>Extremely unpleasant or painful concentration</td>
</tr>
<tr>
<td>Lethal</td>
<td>Lethal to all animals tested</td>
</tr>
</tbody>
</table>
A modified system for classification was suggested, namely, using milligrams per cubic meter (mg/M³) for expressing all inhalation toxicity values and setting the benchmarks for the three toxicity levels, while retaining the same oral and skin absorption units as were shown previously on page 2. These alternative criteria have been listed in Appendix B. Individual materials, whose classification would differ when evaluated by the two sets of criteria, are listed in Table B-1.

**Phase II--Acute Oral and Inhalation Testing of Rats and Mice: Phosphine Evolution from Aluminum Phosphide; and Additional Literature Evaluation**

Phase II consisted primarily of animal testing. Forty chemical materials were tested for oral toxicity and five others for inhalation toxicity in accordance with procedures indicated in Docket HM-51, mentioned earlier. Two animal species, rats and mice, were used in all tests. Oral toxicity test results (LD₅₀ values) and corresponding classifications have been reported in Table III. Similarly, inhalation LC₅₀ values and corresponding classifications have been listed in Table IV. Additional results from inhalation toxicity tests have been included in Table V. It was not possible to run tests at concentrations as high as desired because the silane-air mixtures ignited above a certain concentration. Data sheets, except for silane, have been included in Appendix A in numerical code sequence for materials tested and evaluated in Phase II.

Seven additional materials (Aluminum phosphide--201; Dimethyl sulfate--209; Epichlorohydrin--222; Ethylene chlorohydrin--224, Ethylenediamine--226; Pentachloroethane--236; and Toluene Diisocyanate--249) were classified based upon literature data.

There were a number of metallic phosphides on the DOT list of materials for toxicity evaluation. It was well known that these compounds are hazardous primarily because they generate phosphine (PH₃) on exposure to water or moist air. Aluminum phosphide (AlP) was chosen as representative of these compounds, and experiments were run to determine the rate of generation of PH₃ from AlP in water and in air of 55% relative humidity (RH). Bubbles were observed when AlP was placed in water. It was necessary to make the solution acid (below pH 3.0) before noticeable generation of PH₃ took place. However, placing solid AlP in an air atmosphere of 55% RH resulted in a fairly linear rate of generation of PH₃ as measured by gas chromatography. Under these conditions, PH₃ was formed at a rate of 2.5 mg/min/g of AlP. If excess AlP were present in confined space, so that all the moisture in the 55% RH air was consumed, the final concentration of PH₃ could reach 4800 ppm. A data sheet (Code 201) appears in Appendix A.
Phase III--Acute Inhalation Testing of Rats and Mice with Ammonia, Chlorine and Hydrogen Sulfide

Rat and mouse acute inhalation tests were run on anhydrous ammonia, chlorine and hydrogen sulfide. LC50 values and corresponding classifications have been listed in Table IV along with the Phase II results. Data sheets have been included in Appendix A in numerical code sequence.
### TABLE I

CLASSIFICATION OF DOT CLASS A, B AND C POISONS
FROM LITERATURE DATA
(Based on Criteria from Page 2)

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Name</th>
<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Acetone cyanohydrin</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>002</td>
<td>Alcohol, allyl</td>
<td>TOXIC *</td>
<td></td>
</tr>
<tr>
<td>003</td>
<td>Aldrin</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>Aldrin mixtures, liquid, with more than 60 percent aldrin</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>Aldrin mixtures, dry, with more than 65 percent aldrin</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>004</td>
<td>Ammonium arsenate, solid</td>
<td></td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>005</td>
<td>Aniline oil, liquid</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>006</td>
<td>Arsenic acid, solid</td>
<td>HIGHLY TOXIC</td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>---</td>
<td>Arsenic acid, liquid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>007</td>
<td>Arsenic bromide, solid</td>
<td></td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>008</td>
<td>Arsenic chloride (arsenous), liquid</td>
<td>EXTREMELY TOXIC</td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>009</td>
<td>Arsenic iodide, solid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>010</td>
<td>Arsenic pentoxide, solid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
</tbody>
</table>

*Professional judgment concerning dermal test.
<table>
<thead>
<tr>
<th>Code Number</th>
<th>Name</th>
<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>011</td>
<td>Arsenic solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>012</td>
<td>Arsenic sulfide (powder), solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>013</td>
<td>Arsenic trichloride, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>014</td>
<td>Arsenic trioxide, solid (arsenic, white, solid arsenous acid, solid)</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>015</td>
<td>Arsenic, white, solid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>016</td>
<td>Arsenous acid, solid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>017</td>
<td>Arsenous and mercuric iodide solution, liquid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>018</td>
<td>Barium cyanide, solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>019</td>
<td>Bordeaux arsenites, liquid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td></td>
<td>Bordeaux arsenites, solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>020</td>
<td>Bromacetone, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>021</td>
<td>Brombenzyl cyanide, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>022</td>
<td>Brucine, solid (dimethoxy strychnine)</td>
<td>TOXIC</td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>023</td>
<td>Cacodylic acid, solid (dimethylarsenic)</td>
<td>TOXIC</td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>024</td>
<td>Calcium arsenate, solid</td>
<td>TOXIC</td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>025</td>
<td>Calcium arsenite, solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>026</td>
<td>Carbolic acid (phenol), liquid, (liquid tar acid containing over 50 percent benzo-phenol)</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>027</td>
<td>Carbolic acid (phenol), solid</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>028</td>
<td>Chloracetophenone, gas, liquid or solid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>029</td>
<td>Chloropicrin and nonflammable, nonliquefied compressed gas mixtures</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chloropicrin, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chloropicrin, absorbed</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chloropicrin mixtures (containing no compressed gas or poisonous liquid, class A)</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>030</td>
<td>Chloropicrin and methyl chloride mixtures</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>031</td>
<td>Cocculus, solid (fish berry)</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>032</td>
<td>Copper acetarsenate, solid (emerald green, imperial green, Kings green, moss green, meadow green, mitis green, parrot green, Vienna green, paris green)</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>033</td>
<td>Copper arsenite, solid (Scheele's green, cupric green, copper ortharsenate, Swedish green)</td>
<td>OR, LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>034</td>
<td>Cyanide of calcium or cyanide of calcium mixtures, solid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>035</td>
<td>Cyanide of potassium, liquid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>036</td>
<td>Cyanide of sodium, liquid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>037</td>
<td>Cyanogen bromide</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>038</td>
<td>Cyanogen chloride containing less than 0.9 percent water</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>039</td>
<td>Cyanogen gas (CN)$_2$</td>
<td>HIGHLY TOXIC *</td>
<td></td>
</tr>
<tr>
<td>040</td>
<td>Dinitrobenzol, solid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>041</td>
<td>Dinitrochlorobenzol, solid (dinitrochlorobenzene, chlorodinitrobenzol)</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>042</td>
<td>Dinitrophenol solutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>043</td>
<td>Diphenylaminechlorarsine, gas, liquid, or solid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>044</td>
<td>Diphenylchlorarsine, solid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>045</td>
<td>Ethyldichloroarsine</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>046</td>
<td>Ferric arsenate, solid</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
</tbody>
</table>

*Professional judgment.*
<table>
<thead>
<tr>
<th>Code Number</th>
<th>Name</th>
<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>047</td>
<td>Ferric arsenite, solid</td>
<td></td>
<td>ORAL LD₅₀</td>
</tr>
<tr>
<td>048</td>
<td>Ferrous arsenate (iron arsenate), solid</td>
<td></td>
<td>ORAL LD₅₀</td>
</tr>
<tr>
<td>049</td>
<td>Hexaethyl tetraphosphate and compressed gas mixture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hexaethyl tetraphosphate, liquid</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hexaethyl tetraphosphate mixture, dry</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hexaethyl tetraphosphate mixture, liquid</td>
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<td>Hydrocyanic acid, liquefied</td>
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<td>Hydrocyanic acid (prussic), liquid</td>
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<td>Hydrocyanic acid solutions</td>
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<td>Lewisite</td>
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<td>London purple, solid</td>
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<td>Magnesium arsenate, solid</td>
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<td>Mercuric acetate</td>
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<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
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<td>Mercuric-ammonium chloride, solid</td>
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<td>058</td>
<td>Mercuric benzoate, solid</td>
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<td>Mercuric bromide, solid</td>
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<td>Mercuric cyanide, solid</td>
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<td>Mercuric oleate, solid</td>
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<td>Mercuric oxide (yellow), solid</td>
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<td>Mercuric oxycyanide, solid</td>
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<td>066</td>
<td>Mercuric-potassium cyanide, solid</td>
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<td>Mercuric-potassium iodide, solid</td>
<td></td>
<td>ORAL LD₅₀</td>
</tr>
<tr>
<td>068</td>
<td>Mercuric salicylate, solid</td>
<td></td>
<td>ORAL LD₅₀</td>
</tr>
<tr>
<td>069</td>
<td>Mercuric subsulfate, solid</td>
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<td>ORAL LD₅₀</td>
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<td>Mercuric sulfate, solid</td>
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</tr>
<tr>
<td>071</td>
<td>Mercuric sulfo cyanate, solid (mercuric thiocyanate)</td>
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<td>ORAL LD₅₀</td>
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TABLE I continued

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<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
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<td>Mercurol (mercury nuclease), solid</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<td>073</td>
<td>Mercurous bromide, solid</td>
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<td>Mercurous gluconate, solid</td>
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<td>Mercurous iodide, solid</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<tr>
<td>076</td>
<td>Mercurous nitrate, solid</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<td>077</td>
<td>Mercurous oxide, black, solid</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<td>Mercurous sulfate, solid</td>
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<td>Mercury acetate, solid</td>
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<td>080</td>
<td>Mercury bichloride, solid (mercuric chloride)</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<tr>
<td>081</td>
<td>Mercury bisulfate, solid</td>
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<tr>
<td>083</td>
<td>Methyl bromide and chloropicrin mixture, liquid</td>
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<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
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<tr>
<td>084</td>
<td>Methyl bromide and ethylene dibromide mixture, liquid</td>
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<tr>
<td>085</td>
<td>Methyl bromide and nonflammable, nonliquefied compressed gas mixtures, liquid</td>
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<tr>
<td>085</td>
<td>Methyl bromide, liquid (bromomethane)</td>
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<tr>
<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
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<td>086</td>
<td>Methyl parathion, liquid</td>
<td>HIGHLY TOXIC</td>
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<tr>
<td>087</td>
<td>Monochloracetone, stabilized</td>
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<td>088</td>
<td>Mustard gas</td>
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<tr>
<td>089</td>
<td>Nickel cyanide, solid</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>090</td>
<td>Nicotine hydrochloride</td>
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<tr>
<td>091</td>
<td>Nicotine, liquid</td>
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<tr>
<td>092</td>
<td>Nicotine salicylate</td>
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<tr>
<td>093</td>
<td>Nicotine sulfate, liquid</td>
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<tr>
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<td>Nicotine tartrate</td>
<td>EXTREMELY TOXIC</td>
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<tr>
<td>095</td>
<td>Nitric oxide</td>
<td>EXTREMELY TOXIC*</td>
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<tr>
<td>096</td>
<td>Nitrobenzol, liquid (oil of mirbane)</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>097</td>
<td>Nitrochlorbenzene, ortho, liquid</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>098</td>
<td>Nitrochlorbenzene, meta or para, solid</td>
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<td>ORAL LD₅₀</td>
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*Professional judgment.
## TABLE 1 continued

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<th>Information Needed for Classification</th>
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<tbody>
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<td>Nitrogen dioxide, liquid</td>
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<td>100</td>
<td>Nitrogen peroxide, liquid</td>
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<td>101</td>
<td>Nitrogen tetroxide, liquid</td>
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<tr>
<td>102</td>
<td>Nitrogen tetroxide-nitric oxide mixtures containing up to 33.2 percent weight nitric oxide</td>
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<td>Nitroxylol</td>
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<td>103</td>
<td>Ortho-nitroaniline</td>
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<td>104</td>
<td>Paranitranilne (paranitroaniline), solid</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>105</td>
<td>Parathion and compressed gas mixture</td>
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</tr>
<tr>
<td>---</td>
<td>Parathion, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>Parathion, mixture, dry</td>
<td>EXTREMELY TOXIC</td>
<td></td>
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<tr>
<td>---</td>
<td>Parathion mixture, liquid</td>
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<td>106</td>
<td>Paris green, solid (copper acetoarsenite)</td>
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<td>107</td>
<td>Perchloromethyl mercaptan</td>
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<td>Phenylcarbylamine chloride</td>
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<td>Phenylidichlorarsine, liquid</td>
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### TABLE I continued

<table>
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<th>Code Number</th>
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<tr>
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<td>Phosphoric anhydride</td>
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<td>Potassium arsenate, solid</td>
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<tr>
<td>113</td>
<td>Potassium arsenite, solid</td>
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<td>114</td>
<td>Sodium arsenate, solid</td>
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<tr>
<td>115</td>
<td>Sodium arsenate (solution), liquid</td>
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<tr>
<td>116</td>
<td>Sodium azide</td>
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<td>117</td>
<td>Sodium cacodylate, solid (sodium dimethyl arsenate)</td>
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<td>118</td>
<td>Strontium arsenite, solid</td>
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<td></td>
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<tr>
<td>119</td>
<td>Strychnine and salts thereof, solid</td>
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<td>120</td>
<td>Tetraethyl diothio phosphophosphate, liquid</td>
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<td>Tetraethyl dithio phosphate and compressed gas mixture</td>
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<tr>
<td>121</td>
<td>Tetraethyl dithio phosphate mixture, liquid</td>
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<td></td>
<td>Tetraethyl dithio phosphate mixture, dry</td>
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<tr>
<td>122</td>
<td>Tetraethyl lead</td>
<td>HIGHLY TOXIC</td>
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<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
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<td>-----------------------------------------------------------</td>
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<td>123</td>
<td>Tetraethyl pyrophosphate and compressed gas mixture</td>
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<td>Tetraethyl pyrophosphate, liquid</td>
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<td>124</td>
<td>Tetraethyl pyrophosphate mixture, dry</td>
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<tr>
<td>---</td>
<td>Tetraethyl pyrophosphate mixture, liquid</td>
<td>EXTREMELY TOXIC</td>
<td></td>
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<tr>
<td>125</td>
<td>Thallium sulfate, solid</td>
<td>HIGHLY TOXIC</td>
<td>1 HOUR- LC₅₀</td>
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<tr>
<td>126</td>
<td>Thiophosgene (Thiocarbonyl chloride)</td>
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<tr>
<td>127</td>
<td>Xylyl bromide</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>128</td>
<td>Zinc arsenate</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>129</td>
<td>Zinc arsenite, solid</td>
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### TABLE II

CLASSIFICATION FROM LITERATURE DATA OF TOXIC MATERIALS LISTED UNDER UNITED NATIONS SUBSIDIARY HEALTH HAZARD CATEGORY

(Based on Criteria from Page 2)

<table>
<thead>
<tr>
<th>Code Number</th>
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<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
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<tbody>
<tr>
<td>130</td>
<td>Acid mixtures, hydrofluoric and sulphuric</td>
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<tr>
<td>131</td>
<td>Acrolein (Acraldehyde), inhibited</td>
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<tr>
<td>132</td>
<td>Acrylonitrile, inhibited</td>
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<tr>
<td>002</td>
<td>Allyl alcohol</td>
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<tr>
<td>133</td>
<td>Allyl chloride</td>
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</tr>
<tr>
<td>134</td>
<td>Aluminium ferrosilicon powder</td>
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</tr>
<tr>
<td>135</td>
<td>Ammonia, anhydrous, liquefied and ammonia solutions having a density (specific gravity) of less than 0.880 at 15°C</td>
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<td></td>
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<tr>
<td>136</td>
<td>Antimony pentafluoride</td>
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<td>ORAL LD₅₀</td>
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<tr>
<td>137</td>
<td>Barium azide, dry or containing, by weight, less than 50% water or alcohol</td>
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<tr>
<td>138</td>
<td>Barium chloride</td>
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<td>ORAL LD₅₀</td>
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<td>139</td>
<td>Barium nitrate</td>
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<td>Barium perchlorate</td>
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<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
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<td>Barium permanganate</td>
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<td>142</td>
<td>Barium peroxide (Barium binoxide, Barium dioxide, Barium superoxide)</td>
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<td>ORAL LD\textsubscript{50}</td>
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<td>143</td>
<td>Boron trichloride</td>
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<td>1 HOUR-LC\textsubscript{50}</td>
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<td>144</td>
<td>Boron trifluoride</td>
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<td>1 HOUR-LC\textsubscript{50}</td>
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<td>145</td>
<td>Bromine pentafluoride</td>
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<td>1 HOUR-LC\textsubscript{50}</td>
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<td>146</td>
<td>Bromine and solutions of bromine</td>
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<td>1 HOUR-LC\textsubscript{50}</td>
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<tr>
<td>147</td>
<td>Bromine trifluoride</td>
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<td>1 HOUR-LC\textsubscript{50}</td>
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<td>148</td>
<td>Carbon dioxide and ethylene oxide mixtures, containing not more than 10% carbon dioxide</td>
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<td>149</td>
<td>Carbon disulphide (Carbon bisulphide)</td>
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<td>Carbon monoxide</td>
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<td>Carbon tetrachloride</td>
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<td>Chlorine</td>
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<td>153</td>
<td>Chlorine trifluoride</td>
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<td>083</td>
<td>Chloropicrin and methyl bromide mixtures</td>
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<td>154</td>
<td>Chloropicrin and methyl chloride mixtures</td>
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<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
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<td>Chloroprene, inhibited</td>
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<td>Coal gas</td>
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<td>157</td>
<td>Cupriethylene diamine, solution</td>
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<tr>
<td>158</td>
<td>Cyanogen, liquefied</td>
<td>TOXIC</td>
<td>ORAL LD$_{50}$</td>
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<tr>
<td>159</td>
<td>Cyclonite (Cyclotrimethylene trinitramine, or Hexogene, or R.D.X.)</td>
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<td>Decaborane</td>
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<tr>
<td>161</td>
<td>Diborane</td>
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<tr>
<td>162</td>
<td>1-1 Difluoroethylene</td>
<td>Below TOXIC</td>
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<tr>
<td>163</td>
<td>Dinitrophenol, dry or containing, by weight, less than 15% water</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>164</td>
<td>Dinitrophenol, containing, by weight, at least 15% water</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>Dipicrylamine (Hexanitrodiphenylamine or Hexyl)</td>
<td></td>
<td>ORAL LD$_{50}$</td>
</tr>
<tr>
<td>166</td>
<td>Ethyl chloroformate (Ethyl chlorocarbonate)</td>
<td></td>
<td>1 HOUR-LC$_{50}$</td>
</tr>
<tr>
<td>167</td>
<td>Ethylene oxide (Oxirane, Epoxyethylene) containing not more than 0.2% nitrogen</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethyleneimine, inhibited</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
</tbody>
</table>

*Professional judgment.
<table>
<thead>
<tr>
<th>Code Number</th>
<th>Name</th>
<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>168</td>
<td>Ferrosilicon, containing more than 30% and less than 90% of this substance</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>169</td>
<td>Fluorine</td>
<td>EXTREMELY TOXIC*</td>
<td></td>
</tr>
<tr>
<td>170</td>
<td>Hexamethylenediamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171</td>
<td>Hydrazine, anhydrous, and aqueous solutions of hydrazine containing not more than 36%, by weight, water</td>
<td>HIGHLY TOXIC*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrazine hydrate and aqueous solutions of hydrazine containing more than 36%, by weight, water</td>
<td>HIGHLY TOXIC*</td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>Hydrofluoric acid solution (Fluoric acid, Hydrogen fluoride solution)</td>
<td>HIGHLY TOXIC*</td>
<td></td>
</tr>
<tr>
<td>173</td>
<td>Hydrogen bromide, anhydrous</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrogen cyanide (Hydrocyanic acid), anhydrous, stabilized</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>Hydrogen fluoride, anhydrous</td>
<td>HIGHLY TOXIC*</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>Hydrogen sulphide, (sulphuretted hydrogen) liquefied</td>
<td>HIGHLY TOXIC*</td>
<td></td>
</tr>
<tr>
<td>176</td>
<td>Iron pentacarbonyl</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>177</td>
<td>Lead nitrate</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>Code Number</td>
<td>Name</td>
<td>Toxicity Classification</td>
<td>Information Needed for Classification</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>178</td>
<td>Lead perchlorate</td>
<td></td>
<td>ORAL (LD_{50})</td>
</tr>
<tr>
<td>200</td>
<td>Magnesium phosphide</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>179</td>
<td>Methanol (Methyl alcohol, Wood alcohol, Columbian spirits)</td>
<td>Below TOXIC</td>
<td></td>
</tr>
<tr>
<td>085</td>
<td>Methyl bromide (Bromomethane)</td>
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<tr>
<td>180</td>
<td>Methyl chloroformate (Methyl chlorocarbonate)</td>
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<td>1 HOUR-(LC_{50})</td>
</tr>
<tr>
<td>181</td>
<td>Methylmercaptan</td>
<td></td>
<td>1 HOUR-(LC_{50})</td>
</tr>
<tr>
<td>182</td>
<td>Nickel carbonyl</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>183</td>
<td>Nitric acid, red fuming</td>
<td>EXTREMELY TOXIC *</td>
<td></td>
</tr>
<tr>
<td>095</td>
<td>Nitric oxide</td>
<td>EXTREMELY TOXIC *</td>
<td></td>
</tr>
<tr>
<td>184</td>
<td>Nitric oxide and nitrogen tetroxide mixtures</td>
<td>EXTREMELY TOXIC *</td>
<td></td>
</tr>
<tr>
<td>099</td>
<td>Nitrogen dioxide (Nitrogen tetroxide), liquefied</td>
<td>EXTREMELY TOXIC *</td>
<td></td>
</tr>
<tr>
<td>185</td>
<td>Nitroglycerin, desensitized with at least 40% by weight, non-volatile phlegmatiser</td>
<td>TOXIC</td>
<td></td>
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<tr>
<td>110</td>
<td>Phosgene (Carbonyl chloride)</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>187</td>
<td>Phosphorus, white or yellow, dry or under water or in solution</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
</tbody>
</table>

*Professional judgment.
<table>
<thead>
<tr>
<th>Code Number</th>
<th>Name</th>
<th>Toxicity Classification</th>
<th>Information Needed for Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>188</td>
<td>Potassium bifluoride</td>
<td>TOXIC</td>
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</tr>
<tr>
<td>189</td>
<td>Potassium fluoride</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>190</td>
<td>Potassium phosphide</td>
<td>EXTREMELY TOXIC</td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>191</td>
<td>Potassium sulphide, hydrated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>192</td>
<td>Pyridine</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>193</td>
<td>Silicon tetrafluoride</td>
<td>TOXIC</td>
<td></td>
</tr>
<tr>
<td>194</td>
<td>Sodium hydrogen sulphate, containing more than 3% free acid</td>
<td>EXTREMELY TOXIC</td>
<td>ORAL LD&lt;sub&gt;50&lt;/sub&gt;</td>
</tr>
<tr>
<td>195</td>
<td>Sodium phosphide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>196</td>
<td>Strontium phosphide</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
<tr>
<td>197</td>
<td>Sulphur dioxide, liquefied</td>
<td>HIGHLY TOXIC</td>
<td></td>
</tr>
<tr>
<td>198</td>
<td>Sulphuric acid fuming</td>
<td>EXTREMELY TOXIC</td>
<td></td>
</tr>
</tbody>
</table>

*Professional judgment.*
## Table III

**SUMMARY RESULTS OF ACUTE ORAL TOXICITY TESTS**

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Compound</th>
<th>LD50 (mg/Kg)</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rat</td>
<td>Mouse</td>
</tr>
<tr>
<td>024</td>
<td>Calcium arsenate</td>
<td>812</td>
<td>794</td>
</tr>
<tr>
<td>056</td>
<td>Mercuric acetate</td>
<td>76</td>
<td>62</td>
</tr>
<tr>
<td>060</td>
<td>Mercuric cyanide</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td>064</td>
<td>Mercuric oxide</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>070</td>
<td>Mercuric sulfate</td>
<td>57</td>
<td>40</td>
</tr>
<tr>
<td>076</td>
<td>Mercurous nitrate</td>
<td>297</td>
<td>388</td>
</tr>
<tr>
<td>093</td>
<td>Nicotine sulfate</td>
<td>75</td>
<td>16</td>
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<tr>
<td>103</td>
<td>o-nitroaniline</td>
<td>3564</td>
<td>1288</td>
</tr>
<tr>
<td>202</td>
<td>Aniline hydrochloride</td>
<td>1072</td>
<td>841</td>
</tr>
<tr>
<td>203</td>
<td>Benzidine</td>
<td>566</td>
<td>214</td>
</tr>
<tr>
<td>204</td>
<td>Benzyl chloride</td>
<td>1231</td>
<td>1624</td>
</tr>
<tr>
<td>205</td>
<td>Benzylidine chloride</td>
<td>3249</td>
<td>2462</td>
</tr>
<tr>
<td>206</td>
<td>o-chloronitrobenzene</td>
<td>268</td>
<td>135</td>
</tr>
<tr>
<td>208</td>
<td>p-chloronitrobenzene</td>
<td>812</td>
<td>1414</td>
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<tr>
<td>214</td>
<td>4, 6-dinitro-orthocresol</td>
<td>33</td>
<td>21</td>
</tr>
<tr>
<td>216</td>
<td>2, 3-dinitrotoluene</td>
<td>1122</td>
<td>1072</td>
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<tr>
<td>217</td>
<td>2, 4-dinitrotoluene</td>
<td>268</td>
<td>1625</td>
</tr>
<tr>
<td>218</td>
<td>2, 5-dinitrotoluene</td>
<td>707</td>
<td>1231</td>
</tr>
<tr>
<td>219</td>
<td>2, 6-dinitrotoluene</td>
<td>177</td>
<td>1000</td>
</tr>
<tr>
<td>220</td>
<td>3, 4-dinitrotoluene</td>
<td>1072</td>
<td>1414</td>
</tr>
<tr>
<td>227</td>
<td>2, 2-dithiobisbenzothiazole</td>
<td>&gt;12,000</td>
<td>&gt;12,000</td>
</tr>
<tr>
<td>228</td>
<td>m-nitroaniline</td>
<td>535</td>
<td>308</td>
</tr>
<tr>
<td>229</td>
<td>p-nitroaniline</td>
<td>3249</td>
<td>812</td>
</tr>
<tr>
<td>230</td>
<td>o-nitrophenol</td>
<td>2828</td>
<td>1297</td>
</tr>
<tr>
<td>231</td>
<td>m-nitrophenol</td>
<td>933</td>
<td>1414</td>
</tr>
<tr>
<td>232</td>
<td>p-nitrophenol</td>
<td>616</td>
<td>467</td>
</tr>
<tr>
<td>233</td>
<td>o-nitrotoluene</td>
<td>891</td>
<td>2462</td>
</tr>
<tr>
<td>234</td>
<td>m-nitrotoluene</td>
<td>1072</td>
<td>1231</td>
</tr>
<tr>
<td>235</td>
<td>p-nitrotoluene</td>
<td>2144</td>
<td>1231</td>
</tr>
<tr>
<td>238</td>
<td>2, 3-xylidine</td>
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<td>1072</td>
</tr>
<tr>
<td>239</td>
<td>2, 4-xylidine</td>
<td>467</td>
<td>250</td>
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<tr>
<td>240</td>
<td>2, 5-xylidine</td>
<td>1297</td>
<td>841</td>
</tr>
<tr>
<td>241</td>
<td>2, 6-xylidine</td>
<td>1231</td>
<td>707</td>
</tr>
<tr>
<td>242</td>
<td>3, 4-xylidine</td>
<td>812</td>
<td>707</td>
</tr>
<tr>
<td>243</td>
<td>3, 5-xylidine</td>
<td>707</td>
<td>421</td>
</tr>
<tr>
<td>244</td>
<td>1-chloronaphthalene</td>
<td>1540</td>
<td>1091</td>
</tr>
<tr>
<td>245</td>
<td>2-chloronaphthalene</td>
<td>2078</td>
<td>886</td>
</tr>
<tr>
<td>246</td>
<td>Mixed cresols</td>
<td>1454</td>
<td>561</td>
</tr>
<tr>
<td>247</td>
<td>2, 4-dichlorophenol</td>
<td>7830</td>
<td>1625</td>
</tr>
<tr>
<td>248</td>
<td>Diethyl sulfate</td>
<td>1412</td>
<td>647</td>
</tr>
</tbody>
</table>
TABLE IV
SUMMARY RESULTS OF ACUTE INHALATION TOXICITY TESTS
(1-HOUR EXPOSURE)

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Compound</th>
<th>Classifications</th>
<th>Rats LC₅₀</th>
<th>Mice LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>Anhydrous ammonia</td>
<td>Toxic</td>
<td>7,338 PPM</td>
<td>5,100 Mg/M³</td>
</tr>
<tr>
<td>204</td>
<td>Benzyl chloride</td>
<td>Toxic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>Benzyldine chloride</td>
<td>Toxic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>152</td>
<td>Chlorine</td>
<td>Toxic</td>
<td>293 PPM</td>
<td>850 Mg/M³</td>
</tr>
<tr>
<td>251</td>
<td>Ethyl bromide</td>
<td>Toxic</td>
<td>26,980 PPM</td>
<td>120,330 Mg/M³</td>
</tr>
<tr>
<td>173</td>
<td>Hydrogen bromide</td>
<td>Toxic</td>
<td>2,858 PPM</td>
<td>9,450 Mg/M³</td>
</tr>
<tr>
<td>175</td>
<td>Hydrogen sulfide</td>
<td>Toxic</td>
<td>713 PPM</td>
<td>990 Mg/M³</td>
</tr>
<tr>
<td>1/</td>
<td>Silane</td>
<td>Below Toxic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/ No data sheet included in Appendix A.
2/ Rats and mice survived exposure to 2 mg/liter (2000 mg/M³) concentrations of these materials for one hour.
3/ 4-Hour exposure to 13,090 mg/M³ of silane caused no death in rats, but four out of ten mice died in four days. No mice died from two hour exposure. Extrapolation to 1-hour exposure indicates the LC₅₀ is below "Toxic" range and well into the explosive range (vapor-air mixture explosive limits). No rodent deaths occurred from 1-hour exposure at a concentration of silane below the lower explosive limit.
<table>
<thead>
<tr>
<th>Compound</th>
<th>Concentration (ppm)</th>
<th>Time of Exposure (hours)</th>
<th>Animal Species</th>
<th>Mortality Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silane</td>
<td>1,000</td>
<td>1.25</td>
<td>Rat</td>
<td>0/5</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td>1.0</td>
<td>Rat</td>
<td>0/5</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
<td>4.0</td>
<td>Rat</td>
<td>0/5</td>
</tr>
<tr>
<td></td>
<td>6,600</td>
<td>1.0</td>
<td>Mouse</td>
<td>0/5</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
<td>4.0</td>
<td>Mouse</td>
<td>4/10</td>
</tr>
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<td>10,000</td>
<td>2.0</td>
<td>Mouse</td>
<td>0/10</td>
</tr>
<tr>
<td>HBr</td>
<td>3,822</td>
<td>1.0</td>
<td>Rat</td>
<td>10/10</td>
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<tr>
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<td>3,711</td>
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<td>Rat</td>
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<td>3,253</td>
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<td>6/10</td>
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<td>2,759</td>
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<td>Rat</td>
<td>4/10</td>
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<td>2,328</td>
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<td>4/10</td>
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<td>2,205</td>
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<td>Rat</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td>1,163</td>
<td>1.0</td>
<td>Mouse</td>
<td>10/10</td>
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<tr>
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<td>1,036</td>
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<td></td>
<td>507</td>
<td>1.0</td>
<td>Mouse</td>
<td>0/10</td>
</tr>
<tr>
<td>Benzyldine chloride</td>
<td>76 (0.5 mg/L)</td>
<td>1.0</td>
<td>Rat</td>
<td>0/10</td>
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<tr>
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<td>76 (0.5 mg/L)</td>
<td>1.0</td>
<td>Mouse</td>
<td>0/10</td>
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<tr>
<td>Benzylic chloride</td>
<td>97 (0.5 mg/L)</td>
<td>1.0</td>
<td>Rat</td>
<td>0/10</td>
</tr>
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<td>97 (0.5 mg/L)</td>
<td>1.0</td>
<td>Mouse</td>
<td>0/10</td>
</tr>
<tr>
<td>Ethyl bromide</td>
<td>20,000</td>
<td>1.0</td>
<td>Rat</td>
<td>0/10</td>
</tr>
<tr>
<td></td>
<td>20,000</td>
<td>1.0</td>
<td>Mouse</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>15,000</td>
<td>1.0</td>
<td>Mouse</td>
<td>4/10</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
<td>1.0</td>
<td>Mouse</td>
<td>0/10</td>
</tr>
</tbody>
</table>
APPENDIX A

DATA SHEETS
COMPOUND: ACETONE CYANOHYDRIN  
(2 Methylactonitrile, a-Hydroxyisobutyronitrile)  

CLASSIFICATION: EXTREMELY TOXIC

### INHALATION TOXICITY

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.*</th>
<th>SYS.**</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rat (4hr)</td>
<td>217 (62)</td>
<td>ALC₅₀</td>
<td>1.3</td>
</tr>
<tr>
<td>Mouse (2hr)</td>
<td>2000 (575)</td>
<td>LC₅₀</td>
<td>1.5</td>
</tr>
<tr>
<td>Dog</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monkey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rat (4hr)</td>
<td>434 (125)</td>
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<td>1.2</td>
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</table>

### ORAL TOXICITY

<table>
<thead>
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<th>DOSE***</th>
<th>SYS.**</th>
<th>REF.</th>
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</thead>
<tbody>
<tr>
<td>Man</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>13.3</td>
<td>LD₅₀</td>
<td>1.1</td>
</tr>
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<td>Mouse</td>
<td>2.9</td>
<td>LD₅₀</td>
<td>1.1</td>
</tr>
<tr>
<td>Dog</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Monkey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cat</td>
<td></td>
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<td>Other (Rabbit)</td>
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### OTHER ROUTES OF ADMINISTRATION

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<td>S. C.</td>
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<td>2. Rabbit</td>
<td>Skin</td>
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</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
Rabbit dermal toxicity falls within the "Extremely Toxic" category. This material contains approximately 0.2% HCN and readily decomposes to HCN in alkaline media. Human fatalities have been reported (1.4) from inhalation and skin contact.

REFERENCES:

1.2 Flury, Abderhaldens Hdb. 4.7b:1340.
1.4 Krefft, S., Arch. fur Gewerberpathol. and Gewerberhyg, 14:110, 1955.
**TOXICITY DATA SHEET**

**COMPOUND: ALCOHOL, ALLYL**

**CODE: 002**

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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<thead>
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<td></td>
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<tr>
<td>Rat (4hr)</td>
<td>594 (250)</td>
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<tr>
<td>Mouse</td>
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<tr>
<td>Dog</td>
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<tr>
<td>Monkey (4hr)</td>
<td>2370 (1000)</td>
<td>Lethal</td>
<td>2.2</td>
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<td>Other</td>
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<tr>
<td>Rabbit (4hr)</td>
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<td>2.2</td>
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<tr>
<td>Rat (1hr)</td>
<td>3840 (1620)</td>
<td>LC₅₀</td>
<td>2.4</td>
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### ORAL TOXICITY

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<td>42-60</td>
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</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:
The inhalation and oral toxicity of this compound falls within the "Toxic" category even though the dermal toxicity falls within the highly toxic category. Since the first two routes of entry are most pertinent to transportation accidents allyl alcohol was classified as "Toxic."

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOUND:** ALDRIN

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Oral and dermal toxicity falls within "Highly Toxic" category.

REFERENCES:

### TOXICITY DATA SHEET

**COMPOUND:** ANILINE OIL, Liquid  
**CODE:** 005

**CLASSIFICATION:** TOXIC

#### INHALATION TOXICITY

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<td>950 (250)</td>
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<td>Mouse(7hr)</td>
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<tr>
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<td>2100 (552)</td>
<td>ALC50</td>
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#### ORAL TOXICITY

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<td>Guinea Pig</td>
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#### OTHER ROUTES OF ADMINISTRATION

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<td>LD50</td>
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<td>2. Rabbit</td>
<td>I. V.</td>
<td>64</td>
<td>LD50</td>
<td>5.4</td>
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<tr>
<td>3. Rabbit</td>
<td>Skin</td>
<td>2500-5000</td>
<td>LD50</td>
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<td>200</td>
<td>Lethal</td>
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<td>5. Cat</td>
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<td>1540</td>
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<td>6. Dog</td>
<td>Skin</td>
<td>1540</td>
<td>Lethal</td>
<td>5.3</td>
</tr>
</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg
Oral and dermal toxicity data fall within the "Toxic" category. The inhalation toxicity values fall in the "Extremely Toxic" classification but are above saturation vapor pressure concentrations which are, therefore, unrealistic for consideration in ranking of toxicity classes for transportation accidents.

REFERENCES:

5.4 Army Chemical Center Report, Project No. 4-16-17-01, June 1949.
TOXICITY DATA SHEET

COMPOUND: ARSENIC ACID, Solid
(Arsenic Pentoxide)  

CODE: 006

CLASSIFICATION: HIGHLY TOXIC

<table>
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<tr>
<td>Rat</td>
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<td>Mouse</td>
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OTHER ROUTES OF ADMINISTRATION

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<tr>
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</tbody>
</table>

* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:

Arsenic acid falls within the "Highly Toxic" range and is another form of arsenic pentoxide ($A_2O_5$).

REFERENCES:

### TOXICITY DATA SHEET

**COMPOUND:** ARSENIC CHLORIDE (Arsenous), Liquid (Arsenic Trichloride)  
**CODE:** 008

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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* Concentration in mg/M³. Particulate solid.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Arsenic chloride fumes in the presence of air and presents an "Extremely Toxic"
inhaledion hazard to man and other animal species.

8.1 Flury, F., Schadliche Gase, p. 80, 1931.
TOXICITY DATA SHEET

COMPOUND: ARSENIC PENTOXIDE, Solid
(Arsenic Acid)

CODE: 010

CLASSIFICATION: HIGHLY TOXIC

<table>
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<tr>
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See data sheet 006

OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M$^3$

** System for expression of toxicity

***Dose in mg/Kg

A-14
JUSTIFICATION:

Arsenic pentoxide falls within the "Highly Toxic" range and is another form of arsenic acid (H$_3$AsO$_4$), namely the anhydride.

REFERENCES:

See data sheet 006
TOXICITY DATA SHEET

COMPOUND: ARSENIC TRICHLORIDE  
(Arsenic Chloride), Liquid  
CODE: 013

CLASSIFICATION:  EXTREMELY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³. Particulate solid.

** System for expression of toxicity

*** Dose in mg/Kg

A-16
JUSTIFICATION:

Arsenic trichloride fumes in the presence of air and presents an "Extremely Toxic" inhalation hazard to man and other animal species.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: ARSENIC TRIOXIDE, Solid  
CODE: 014

CLASSIFICATION: HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M^3
** System for expression of toxicity
*** Dose in mg/Kg

A-18
Experimental toxicity data for species other than man fall in the "Highly Toxic" classification. This category was used since the lethal oral dose for man is estimated and cannot be substantiated. Humans have been reported to have survived larger doses of arsenic trioxide than that suggested as the approximate lethal dose.

REFERENCES:
TOXICITY DATA SHEET

COMPOUND: ARSENIC, WHITE, Solid

CLASSIFICATION: HIGHLY TOXIC

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See Data Sheet Number 014

OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:

This is same compound as Arsenic Trioxide, Solid, No. 014.

REFERENCES:

See data sheet 014
**TOXICITY DATA SHEET**

**COMPUND:** ARSENOUS ACID, Solid

**CODE:** 016

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

This is same compound as Arsenic Trioxide, Solv., No. 014.

REFERENCES:

See data sheet 014
**TOXICITY DATA SHEET**

**COMPUND:** BROMACETONE, Liquid  
**CODE:** 020

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

A-24
JUSTIFICATION:

Based on human toxicity reported for this war gas.

REFERENCES:

20.1 Prentiss, A. M., Chemicals in War, 1937.
TOXICITY DATA SHEET

COMPUND: BROMBENZYL CYANIDE, Liquid  
CODE: 021

CLASSIFICATION:  EXTREMELY TOXIC

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* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-26
JUSTIFICATION: 021

Based on human toxicity reported for this war gas.

REFERENCES:

21.1 Prentiss, A. M., Chemicals in War, p. 147, 1937.
**TOXICITY DATA SHEET**

**COMPOUND:** BRUCINE, Solid  
(Dimethoxy Strychnine)  

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:
This animal toxicity data falls in the "Toxic" classification.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOUND:** CALCIUM ARSENATE  
**CODE:** 024

**CLASSIFICATION:** TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Justification:

Data falls in the "Toxic" classification.

Rat 14-Day LD50 = 812 mg/kg 95% Confidence Limits (712-924)

Mouse 14-Day LD50 = 794 mg/kg 95% Confidence Limits (665-946)
**TOXICITY DATA SHEET**

**COMPOND:** CARBOLIC ACID (PHENOL), Liquid
(Liquid tar acid containing over 50%, Benzo-phenol)

**CLASSIFICATION:** TOXIC

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**INHALATION TOXICITY**

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**ORAL TOXICITY**

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<td>Guinea Pig</td>
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**OTHER ROUTES OF ADMINISTRATION**

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</table>

* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-32
Experimental toxicity data on animals falls in the "Toxic" classification. Although it has been suggested that a phenol dose of 14 mg/kg may be fatal to man, people have been reported (26.4) to survive doses as high as 1000 mg/kg and it is most probable that the toxic dose for man is similar to that of other species ranging from 300-500 mg/kg.

REFERENCES:


26.2 Flury, F., Abderhalden's Hdb., 4.7b:1319.


TOXICITY DATA SHEET

COMPOUND: CARBOLIC ACID (PHENOL), Solid

CLASSIFICATION: TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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<td>Rat</td>
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<td>Cat</td>
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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:
Carbolic Acid, Liquid and Solid, have the same toxicity.

REFERENCES:
See data sheet 026.
TOXICITY DATA SHEET

COMPOUND: CHLORACETOPHENONE, Gas, Liquid or Solid
CODE: 028

CLASSIFICATION: EXTREMELY TOXIC

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<td>Man(10min)</td>
<td>850 (34)</td>
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<tr>
<td>Rat(1hr)</td>
<td>222 (35)</td>
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<td>4345(est) (685)</td>
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<td>G. P. (1hr)</td>
<td>210 (33)</td>
<td>LC51</td>
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<tr>
<td>Man</td>
<td>4.5 (0.7) Intolerable</td>
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<tr>
<td>Man(3min)</td>
<td>31 (5) Intolerable</td>
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OTHER ROUTES OF ADMINISTRATION

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<td>20</td>
<td>LD50</td>
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* Concentration in mg/M³, Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:
The experimental toxicity data for man and other species fall within the "Extremely Toxic" classification. The mouse data which differs is extrapolated beyond the tested points.

REFERENCES:
28.2 Prentiss, A. M., Chemicals in War, 1937.
COMPOUND: CHLOROPICRIN, and nonflammable, nonliquified compressed gas mixtures (Nitrochloroform)  
CODE: 029

CLASSIFICATION: EXTREMELY TOXIC

### INHALATION TOXICITY

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<td>Cat(20min)</td>
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* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-38
JUSTIFICATION:

Extrapolation of the CT values for the inhalation toxicity data places this compound in the "Extremely Toxic" classification.

REFERENCES:


### Toxicity Data Sheet

**Compound:** CHLOROPICRIN and METHYL CHLORIDE MIXTURES

**Code:** 030

**Classification:** EXTREMELY TOXIC

### Inhalation Toxicity

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See Data Sheet Number 029 for Chloropicrin Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-40
JUSTIFICATION:

Based on chloropicrin acute inhalation toxicity which is the most toxic component of this mixture it falls in the "Extremely Toxic" classification.

REFERENCES:

See data sheet 029
TOXICITY DATA SHEET

COMPOUND: COCCULUS, Solid
(Picrotoxin, Fish Berry)

CLASSIFICATION: HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-42
JUSTIFICATION:

Oral toxicity data is in "Highly Toxic" category.

REFERENCES:

31.2 Flury, F., Neftner's Hdb., 4.7b:1385.
TOXICITY DATA SHEET

COMPOUND: COPPER ACETOARSENITE, (Paris Green)  
CODE: 032

CLASSIFICATION: TOXIC

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INHALATION TOXICITY

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ORAL TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M^3
** System for expression of toxicity
*** Dose in mg/Kg

A-44
JUSTIFICATION:

Oral toxicity data fall within the "Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPpound:** CALCIUM CYANIDE, or Calcium Cyanide Mixtures, Solid

**Code:** 034

**Classification:** HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-46
JUSTIFICATION:
Oral toxicity falls in "Highly Toxic" category.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPound:** CYANIDE of POTASSIUM  
**CODE:** 035

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/M³
- ** System for expression of toxicity
- *** Dose in mg/Kg

A-48
Although near the borderline, this compound falls within the "Highly Toxic" classification.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOUND:** CYANIDE OF SODIUM, Liquid  
**CODE:** 036

**CLASSIFICATION:** HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M$^3$
** System for expression of toxicity
***Dose in mg/Kg
Oral and subcutaneous acute toxicity data fall in "Highly Toxic" range. The toxicity data from the I.V. route of administration are dependent upon rate of infusion becoming more toxic the slower NaCN is infused and are therefore not applicable for use in classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** CYANOCYAN BROMIDE  
**CODE:** 037

**CLASSIFICATION:**  
**EXTREMELY TOXIC**

### INHALATION TOXICITY

<table>
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<th>SYS.**</th>
<th>REF.</th>
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<tbody>
<tr>
<td>Man (10 min)</td>
<td>400 (92)</td>
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<tr>
<td>Rat</td>
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<tr>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³. Parenthetical value is PPM.
* System for expression of toxicity
* Dose in mg/Kg.
JUSTIFICATION:

Classified on basis of human toxicity response. May also be compared with cyanogen chloride data sheet 038 which is "Extremely Toxic."

REFERENCES:

37.1 Prentiss, A. M., Chemicals in War, 1937.
TOXICITY DATA SHEET

COMPOUND: CYANOCEN CHLORIDE
(Containing less than 0.97% Water)

CLASSIFICATION: EXTREMELY TOXIC

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<thead>
<tr>
<th>SPECIES</th>
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<th>REF.</th>
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</thead>
<tbody>
<tr>
<td>Man</td>
<td>(30min) 300 (118)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.5</td>
</tr>
<tr>
<td>Rat (2min) 10,100 (3979)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.3</td>
<td></td>
</tr>
<tr>
<td>(30min) 450 (177)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.5</td>
<td></td>
</tr>
<tr>
<td>Mouse (7.5min) 780 (307)</td>
<td>Lethal</td>
<td>38.2</td>
<td></td>
</tr>
<tr>
<td>(30min) 200 (79)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.5</td>
<td></td>
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<tr>
<td>Dog (7.5min) 800 (315)</td>
<td>Lethal</td>
<td>38.2</td>
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<tr>
<td>Monkey</td>
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<tr>
<td>Other</td>
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</tr>
<tr>
<td>Goat (2min) 1800 (709)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.4</td>
<td></td>
</tr>
<tr>
<td>GP (30min) 525 (207)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.5</td>
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</tr>
<tr>
<td>Rabbit (30min) 525 (207)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>38.5</td>
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OTHER ROUTES OF ADMINISTRATION

<table>
<thead>
<tr>
<th>SPECIES</th>
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<th>DOSE***</th>
<th>SYS. **</th>
<th>REF.</th>
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<tbody>
<tr>
<td>1. Dog</td>
<td>S. C.</td>
<td>5-40</td>
<td>Lethal</td>
<td>38.2</td>
</tr>
<tr>
<td>2. Rabbit</td>
<td>S. C.</td>
<td>20</td>
<td>Lethal</td>
<td>38.2</td>
</tr>
<tr>
<td>3. Mouse</td>
<td>S. C.</td>
<td>1-2</td>
<td>Lethal</td>
<td>38.2</td>
</tr>
<tr>
<td>4. Rabbit</td>
<td>S. C.</td>
<td>20</td>
<td>Lethal</td>
<td>38.1</td>
</tr>
</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

The acute inhalation toxicity data for all species extrapolated to 1 hour fall within the "Extremely Toxic" classification limits.

REFERENCES:

38.1 Hunt, R., Heffner's Hdb., 1.1:799, (A).
38.2 Flury, F., Abderhalden's Hdb., 4.7b, 1341.
TOXICITY DATA SHEET

COMPOUND: CYANOGEN GAS (CN)₂

CLASSIFICATION: HIGHLY TOXIC

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<thead>
<tr>
<th>SPECIES</th>
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<td>Man</td>
<td>16 ppm</td>
<td>Irritant</td>
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<td>Rat (1hr)</td>
<td>745 (350)</td>
<td>LC₅₀</td>
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<tr>
<td>Mouse (5 min)</td>
<td>5500 (2585)</td>
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<td>Dog</td>
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<tr>
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<tr>
<td>Cat</td>
<td>210 (98)</td>
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<td>39.2</td>
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<td>Rabbit</td>
<td>840 (395)</td>
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OTHER ROUTES OF ADMINISTRATION

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</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-56
Toxicity data falls in "Highly Toxic" category. The nasal and eye irritation caused by this compound could be extremely hazardous for rescue operations.

REFERENCES:


**TOXICITY DATA SHEET**

**COMPOUND:** DINITROBENZOL, Solid  
(Dinitrobenzene)  
**CODE:** 040

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

- * Concentration in mg/M³
- ** System for expression of toxicity
- ***Dose in mg/Kg
The only data available falls within the "Highly Toxic" classification. This compound has been shown to produce methemoglobin in man and other species and has been reported to produce many human fatalities (40.2).

REFERENCES:


40.2 Von Oettingen, W. F., Public Health Bulletin No. 271, 1941.
TOXICITY DATA SHEET

COMPOUND: DINITROCHLOROBENZOL, Solid
(Dinitrochlorobenzene, Chlorodinitrobenzene)

CLASSIFICATION: TOXIC

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OTHER ROUTES OF ADMINISTRATION

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</table>

- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-60
Oral toxicity falls under "Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPONENT**: DINITROPHENOL SOLUTIONS  
**CODE**: 042

**CLASSIFICATION**: **HIGHLY TOXIC**

### Inhalation Toxicity

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### Oral Toxicity

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<td>30</td>
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<td>Cat</td>
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<tr>
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<td>Other-Rabbit</td>
<td>200</td>
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### Other Routes of Administration

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<td>1. Guinea Pig</td>
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<td>700</td>
<td>Lethal</td>
<td>42.1</td>
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<td>2. Dog</td>
<td>S.C.</td>
<td>25</td>
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<td>i.V.</td>
<td>30</td>
<td>Lethal</td>
<td>42.3</td>
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</table>

* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:
The data fall within the "Highly Toxic" classification.

REFERENCES:
42.1 Spencer, H. C. et al., J. Ind. Hyg. & Toxicol., 30:10, 1948.
42.3 Magne, H. et al., Am. de Physiol. et de Physico. Biol., 7:1, 1932.
**TOXICITY DATA SHEET**

**COMPOUND:** DIPHENYLAMINECHLORALISINE),
**CODE:** 043

**CLASSIFICATION:** EXTREMELY TOXIC

### Inhalation Toxicity

<table>
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<th>REF.</th>
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<tbody>
<tr>
<td>Man (30min)</td>
<td>650 (54)</td>
<td>Lethal</td>
<td>43.3</td>
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<tr>
<td>Rat (1hr)</td>
<td>222 (18)</td>
<td>LC₅₀</td>
<td>43.1</td>
</tr>
<tr>
<td>Mouse (1hr)</td>
<td>1340 (111)</td>
<td>LC₅₀</td>
<td>43.1</td>
</tr>
<tr>
<td>Dog</td>
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<tr>
<td>Other</td>
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<tr>
<td>GP (1hr)</td>
<td>475 (39)</td>
<td>LC₅₀</td>
<td>43.1</td>
</tr>
<tr>
<td>Man (3min)</td>
<td>6 (.05)</td>
<td>Intolerable</td>
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### Oral Toxicity

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<tbody>
<tr>
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</tr>
<tr>
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<td>Cat</td>
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### Other Routes of Administration

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<thead>
<tr>
<th>SPECIES</th>
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<tbody>
<tr>
<td>Rabbit</td>
<td>I. V.</td>
<td>6</td>
<td>LD₅₀</td>
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<td>6.</td>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:

Inhalation toxicity data for most species fall in "Extremely Toxic" classification.

REFERENCES:

43.3 Prentiss, A.M., Chemicals in War, 1937.
## TOXICITY DATA SHEET

**COMPOUND:** DIPHENYLCHLORARSINE, Solid  
(Sneezing Gas)

**CODE:** 044

### CLASSIFICATION: EXTREMELY TOXIC

#### INHALATION TOXICITY

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.**</th>
<th>SYS.**</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man (30 min)</td>
<td>600 (55)</td>
<td>Lethal</td>
<td>44.1</td>
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<tr>
<td>Rat</td>
<td>———</td>
<td>———</td>
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</tr>
<tr>
<td>Mouse</td>
<td>———</td>
<td>———</td>
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<tr>
<td>Dog (50 min)</td>
<td>340 (31)</td>
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<td>44.2</td>
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<td>Monkey</td>
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<td>———</td>
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<tr>
<td>Cat (24 min)</td>
<td>70 (6)</td>
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<td>Other</td>
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#### ORAL TOXICITY

<table>
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<td>———</td>
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<td>Mouse</td>
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<tr>
<td>Monkey</td>
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<tr>
<td>Cat</td>
<td>———</td>
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<tr>
<td>Guinea Pig</td>
<td>———</td>
<td>———</td>
<td>———</td>
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<tr>
<td>Other</td>
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#### OTHER ROUTES OF ADMINISTRATION

<table>
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<tr>
<th>SPECIES</th>
<th>ROUTE</th>
<th>DOSE***</th>
<th>SYS.**</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cat</td>
<td>I. V.</td>
<td>0.5</td>
<td>Lethal</td>
<td>44.2</td>
</tr>
</tbody>
</table>

* Concentration in mg/M³. Dust. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

}\n
A-66
Inhalation data for respirable dust fall in the "Extremely Toxic" classification.

REFERENCES:

44.1 Prentiss, A. M., Chemicals in War, 1937.
TOXICITY DATA SHEET

COMPOUND: ETHYLDICHLOROARSINE

CODE: 045

CLASSIFICATION: EXTREMELY TOXIC

<table>
<thead>
<tr>
<th>SPECIES</th>
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<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man (30min)</td>
<td>100 (14)</td>
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<tr>
<td>Rat</td>
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<tr>
<td>Mouse (15min)</td>
<td>504 (70)</td>
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<tr>
<td>Dog (20min)</td>
<td>675 (94)</td>
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<td>Monkey</td>
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<tr>
<td>Other</td>
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<tr>
<td>Cat (40min)</td>
<td>83 (12)</td>
<td>Lethal</td>
<td>45.1</td>
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<tr>
<td>Mouse</td>
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<td>Dog</td>
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<tr>
<td>Cat</td>
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<tr>
<td>Guinea Pig</td>
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OTHER ROUTES OF ADMINISTRATION

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<th>SYS. **</th>
<th>REF.</th>
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<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-68
JUSTIFICATION:

Data all fall in the "Extremely Toxic" classification.

REFERENCES:

45.2 Prentiss, A. M., Chemicals in War, 1937.
TOXICITY DATA SHEET

COMPOUND: HEXAETHYL TETRAPHOSPHATE  CODE: 049

CLASSIFICATION: HIGHLY TOXIC

### INHALATION TOXICITY

<table>
<thead>
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<th>SPECIES</th>
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### ORAL TOXICITY

<table>
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<tr>
<td>Man</td>
<td>7</td>
<td>LD$_{50}$</td>
<td>49.1</td>
</tr>
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<td>Rat</td>
<td>5</td>
<td>ALD</td>
<td>49.3</td>
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<tr>
<td>Mouse</td>
<td>56</td>
<td>LD$_{50}$</td>
<td>49.1</td>
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<tr>
<td>Dog</td>
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<tr>
<td>Monkey</td>
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<tr>
<td>Cat</td>
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<tr>
<td>Guinea Pig</td>
<td>16</td>
<td>LD$_{50}$</td>
<td>49.1</td>
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<tr>
<td>Other-Rabbit</td>
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<td>LD$_{50}$</td>
<td>49.1</td>
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### OTHER ROUTES OF ADMINISTRATION

<table>
<thead>
<tr>
<th>SPECIES</th>
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<th>SYS. **</th>
<th>REF.</th>
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</thead>
<tbody>
<tr>
<td>1. Dog</td>
<td>I. V.</td>
<td>1.3</td>
<td>Lethal</td>
<td>49.2</td>
</tr>
<tr>
<td>2. Dog</td>
<td>I. M.</td>
<td>1.5</td>
<td>Lethal</td>
<td>49.2</td>
</tr>
<tr>
<td>3. Rabbit</td>
<td>I. V.</td>
<td>0.7</td>
<td>LD$_{50}$</td>
<td>49.1</td>
</tr>
</tbody>
</table>

* Concentration in mg/M$^3$
** System for expression of toxicity
***Dose in mg/Kg
The oral toxicity for most species falls in the "Highly Toxic" classification.

REFERENCES:


TOXICITY DATA SHEET

COMPOUND: HYDROCYANIC ACID, Liquified
(Hydrogen Cyanide)  

CODE: 050

CLASSIFICATION: EXTREMELY TOXIC

<table>
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<tr>
<td>Rat (5min)</td>
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<td>330</td>
<td>LC₅₀</td>
<td>50.2</td>
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<tr>
<td>Monkey</td>
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</tr>
<tr>
<td>Other</td>
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** INHALATION TOXICITY **

** ORAL TOXICITY **

<table>
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<td></td>
</tr>
<tr>
<td>Mouse</td>
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<td></td>
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<tr>
<td>Dog</td>
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<td>Lethal</td>
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<td>Monkey</td>
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<tr>
<td>Cat</td>
<td>2-4</td>
<td>Lethal</td>
<td>50.1</td>
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<tr>
<td>Guinea Pig</td>
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** OTHER ROUTES OF ADMINISTRATION **

<table>
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<th>SYS. **</th>
<th>REF.</th>
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<tbody>
<tr>
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<td>S. C.</td>
<td>1.7</td>
<td>Lethal</td>
<td>50.1</td>
</tr>
<tr>
<td>2. Cat</td>
<td>S. C.</td>
<td>1.1</td>
<td>Lethal</td>
<td>50.1</td>
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<tr>
<td>3. Rabbit</td>
<td>S. C.</td>
<td>1.1-3.0</td>
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<td>50.1</td>
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<td>6.</td>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-72
JUSTIFICATION:

Oral and inhalation toxicity data fall within the "Extremely Toxic" classification.

REFERENCES:

50.1 Flury, F. and F. Zernik, Abderhalden's Hdb., 4.7b:1340.

# TOXICITY DATA SHEET

**COMPOUND:** LEAD ARSENATE  
**CODE:** 051

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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<tr>
<td>Rat</td>
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<td>Mouse</td>
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### ORAL TOXICITY

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<td>Cat</td>
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<td>Rat</td>
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<td>ALD</td>
<td>51.2</td>
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### OTHER ROUTES OF ADMINISTRATION

<table>
<thead>
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<th>SPECIES</th>
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<th>DOSE***</th>
<th>SYS.**</th>
<th>REF.</th>
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<td>Skin</td>
<td>&gt;2400</td>
<td>LD₅₀</td>
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<td>6.</td>
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</tbody>
</table>

* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
Rat oral and dermal toxicity data fall in the "Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPONENT: LEWISITE (Beta-Chlorovinyl dichloroarsine) CODE: 053

CLASSIFICATION: EXTREMELY TOXIC

<table>
<thead>
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<th>CONC.*</th>
<th>SYS.**</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>48 (6)</td>
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<td>53.1</td>
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<tr>
<td>Rat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse</td>
<td></td>
<td></td>
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<tr>
<td>Dog</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M$^3$. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-76
JUSTIFICATION:

Based on human dermal and inhalation toxicity, Lewisite falls in the "Extremely Toxic" classification.

REFERENCES:

53.1 Prentiss, A. M., Chemicals in War, 1937.
**TOXICITY DATA SHEET**

**COMPOUND:** MAGNESIUM ARSENATE, Solid

**CODE:** 055

**CLASSIFICATION:** TOXIC

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**INHALATION TOXICITY**

**ORAL TOXICITY**

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**OTHER ROUTES OF ADMINISTRATION**

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Oral toxicity data fall in "Toxic" category.

REFERENCES:


## TOXICITY DATA SHEET

### COMPOUND: MERCURIC ACETATE  
**Code:** 056

### CLASSIFICATION: TOXIC

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 76 mg/kg
95% Confidence Limits (55-105)

Mouse 14-Day LD$_{50}$ = 62 mg/kg
95% Confidence Limits (41-92)

Data fall in the "Toxic" category.
# Toxidity Data Sheet

**Compound:** Mercuric Cyanide  
**Code:** 060

**Classification:** Highly Toxic

## Inhalation Toxicity

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## Oral Toxicity

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## Other Routes of Administration

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2.  
3.  
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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

**A-82**
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 26 mg/kg
95% Confidence Limits (15-46)

Mouse 14-Day LD$_{50}$ = 33 mg/kg
95% Confidence Limits (22-49)

Data fall in the "Highly Toxic" category.
# TOXICITY DATA SHEET

**COMPOUND:** MERCURIC IODIDE  
**CODE:** 061

**CLASSIFICATION:** HIGHLY TOXIC

## Inhalation Toxicity

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## Oral Toxicity

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## Other Routes of Administration

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* Concentration in mg/M$^3$  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Rat oral toxicity data fall in the "Highly Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPUND:** MERCURIC OXIDE (YELLOW), SOLID

**CODE:** 064

**CLASSIFICATION:** HIGHLY TOXIC

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### Oral Toxicity

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</table>

* Concentration in mg/M<sup>3</sup>
** System for expression of toxicity
*** Dose in mg/Kg

A-86
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 18 mg/kg
95\% Confidence Limits (7-44)

Mouse 14-Day LD$_{50}$ = 22 mg/kg
95\% Confidence Limits (10-48)

Data fall in the "Highly Toxic" category.
TOXICITY DATA SHEET

COMPOUND: MERCURIC SULFATE, SOLID

CLASSIFICATION: HIGHLY TOXIC

## Inhalation Toxicity

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## Oral Toxicity

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## Other Routes of Administration

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-88
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 57 mg/kg

95% Confidence Limits (27-120)

Mouse 14-Day LD$_{50}$ = 40 mg/kg

95% Confidence Limits (30-50)

Rat data fall in the "Toxic" category. However, this is a borderline case and the mouse data are within the "Highly Toxic" classification which has been assigned to this commodity as an overall evaluation.
TOXICITY DATA SHEET

COMPUND: MERCURUS IODIDE  
CODE: 075

CLASSIFICATION: TOXIC

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INHALATION TOXICITY

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ORAL TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-90
JUSTIFICATION:

Oral toxicity data fall within the "Toxic" classification.

REFERENCES:

COMPOUND: MERCURIOUS NITRATE  
CODE: 076

CLASSIFICATION: TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 297 mg/kg
95% Confidence Limits (248-362)

Mouse 14-Day LD$_{50}$ = 388 mg/kg
95% Confidence Limits (290-530)

Data fall within the "Toxic" category.
## TOXICITY DATA SHEET

**COMPOUND:** MERCURY BICHLORIDE, Solid  
(Mercuric Chloride)  

**CODE:** 080

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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- Concentration in mg/M³
- ** System for expression of toxicity
- ***Dose in mg/Kg

A-94
JUSTIFICATION:

All data fall within the "Highly Toxic" range.

REFERENCES:

80.1 Hesse, E., Arch. f. Exp. Path. in Pharmak., 117:226, 1926.
80.2 Wien, R., Quart. J. Pharmacy and Pharmacol., 12:221, 1939.
## TOXICITY DATA SHEET

**COMPUND:** METHYL BROMIDE and CHLOROPICRIN MIXTURE, Liquid  
**CODE:** 083

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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*See Data Sheet Number 029 for Chloropicrin Toxicity.*

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

Based on chloropicrin acute toxicity which is the most toxic component of the mixture, it falls in the "extremely toxic" classification.

REFERENCES:

See data sheets 029 and 030.
**TOXICITY DATA SHEET**

**COMPOUND:** METHYL BROMIDE and ETHYLENE DIBROMIDE MIXTURES  
(Data for Ethylene Dibromide)  

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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<td>5300 (689)</td>
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See Data Sheet Number 085, Methyl Bromide Toxicity Data.

### ORAL TOXICITY

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</table>

- Concentration in mg/M³. Parenthetical values are PPM.  
- System for expression of toxicity  
- Dose in mg/Kg

A-98
Both the compounds of this mixture fall in the "Toxic" classification and, even if additive toxic effects are postulated, the mixture would still be in the same category.

REFERENCES:

Note - See Data Sheet 085 for Methyl Bromide Toxicity.
**TOXICITY DATA SHEET**

**COMPOUND:** METHYL BROMIDE, Liquid  
(Bromomethane)  

**CODE:** 085

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg

A-100
JUSTIFICATION:

Acute inhalation toxicity data fall in the "Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** METHYL PARATHION  
**CODE:** 086

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Based on rat oral and dermal toxicity, methyl parathion is "Highly Toxic."

REFERENCES:

TOXICITY DATA SHEET

COMPPOUND: MONOCHLORACETONE, STABILIZED
(1-Chloro-2-Propanone)

CLASSIFICATION: EXTREMELY TOXIC

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-104
JUSTIFICATION:

World War I experience indicates that a 10 minute exposure to 2300 mg/M$^3$ is lethal to man, and therefore, the extrapolated 1 hour lethal dose falls within the "Extremely Toxic" classification.

REFERENCES:

87.1 Prentiss, A. M., Chemicals in War, 1937.
### TOXICITY DATA SHEET

**COMPOUND:** MUSTARD GAS  
**CODE:** 085

**CLASSIFICATION:** EXTREMELY TOXIC

#### INHALATION TOXICITY

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* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
Based on inhalation toxicity data and other allied values, mustard gas falls in the "Extremely Toxic" classification.

REFERENCES:

88.2 Prentiss, A.M., Chemicals In War, 1937.
### TOXICITY DATA SHEET

**COMPOUND:** NICOTINE HYDROCHLORIDE  
**CODE:** 090

**CLASSIFICATION:** EXTREMELY TOXIC

#### INHALATION TOXICITY

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#### OTHER ROUTES OF ADMINISTRATION

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- **CONCENTRATION in mg/M³**
- **SYSTEM for expression of toxicity**
- **DOSE in mg/Kg**
JUSTIFICATION:

As in the case of nicotine, it appears that humans are more susceptible because of demonstrated effects of extremely low doses on the CNS and autonomic nervous system. The estimated minimum lethal dose of 1 mg/Kg makes this compound "Extremely Toxic."

REFERENCES:

# TOXICITY DATA SHEET

**COMPOUND:** NICOTINE  
**CODE:** 091

**CLASSIFICATION:** EXTREMELY TOXIC

## INHALATION TOXICITY

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## ORAL TOXICITY

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## OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

It appears that humans are more susceptible because of demonstrated effects extremely low doses on the CNS and autonomic nervous system. The estimated minimum lethal dose of 1 mg/kg makes this compound "Extremely Toxic."

REFERENCES:

**TOXICITY DATA SHEET**

**COMPONENT**: NICOTINE SULFATE, LIQUID  
**CODE**: 093

**CLASSIFICATION**: HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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- *Concentration in mg/M³*
- **System for expression of toxicity**
- ***Dose in mg/Kg***

A-112
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD<sub>50</sub> = 75 mg/kg
95% Confidence Limits (44-127)

Mouse 14-Day LD<sub>50</sub> = 16 mg/kg
95% Confidence Limits (12-21)

Data fall within the "Highly Toxic" category.
TOXICITY DATA SHEET

COMPOUND: NICOTINE TARTRATE

CLASSIFICATION: EXTREMELY TOXIC

INHALATION TOXICITY

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ORAL TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-114
JUSTIFICATION:

If the MLD's had been expressed as free nicotine base, this compound would be equally as toxic as the other nicotine compounds.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** NITRIC OXIDE  
**CODE:** 095

**CLASSIFICATION:** **EXTREMELY TOXIC**

### Inhalation Toxicity

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*See Data Sheet Number 099, Nitrogen Dioxide*

### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

**A-116**
JUSTIFICATION:

This compound is not highly toxic per se but is rapidly converted in air to nitrogen dioxide which is "Extremely Toxic."

REFERENCES:

See data sheet 099.
**TOXICITY DATA SHEET**

**COMPOUND:** NITROBENZOL  
(Oil of Mirbane, Nitrobenzene)

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

All available data falls in the "Toxic" classification.

REFERENCES:

96.2 Flury, F., Abderhalden's Hdb., 4, 7b, 1375.
**TOXICITY DATA SHEET**

**COMPOUND:** NITROGEN DIOXIDE  
(Nitrogen Peroxide)  

**CODE:** 099

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

A-120
Based on the acute inhalation toxicity, this compound is considered "Extremely Toxic."

REFERENCES:


TOXICITY DATA SHEET

COMPOUND: NITROGEN PEROXIDE
(Nitrogen Dioxide)

CODE: 100

CLASSIFICATION: EXTREMELY TOXIC

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See Data Sheet Number 099, Nitrogen Dioxide

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- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-122
JUSTIFICATION:
See data sheet 099.

REFERENCES:
See data sheet 099.
**TOXICITY DATA SHEET**

**COMPOUND:** NITROGEN TETROXIDE

**CODE:** 101

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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See Data Sheet Number 099, Nitrogen Dioxide

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- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-124
JUSTIFICATION:  
Nitrogen tetroxide is a dimer of nitrogen dioxide and the relative concentrations of each compound in the mixture are the same no matter which pure compound is the starting material.

REFERENCES:  
See data sheet 099.
COMPOUND: NITROGEN TETROXIDE, Nitric Oxide
Mixtures (Containing up to 33.2% by weight of nitric oxide)

CLASSIFICATION: EXTREMELY TOXIC

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See Data Sheet Number 099, Nitrogen Dioxide

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- Concentration in mg/M^3
- System for expression of toxicity
- Dose in mg/Kg

A-126
JUSTIFICATION:

In the presence of air, the nitric oxide component would be rapidly converted to nitrogen dioxide - nitrogen tetroxide and have the toxicity of this substance.

REFERENCES:

See data sheet 099.
TOXICITY DATA SHEET

COMPOUND: ORTHO-NITROANILINE

CLASSIFICATION: TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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</table>

* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 3564 mg/kg  
95% Confidence Limits (2590-4910)

Mouse 14-Day LD$_{50}$ = 1288 mg/kg  
95% Confidence Limits (1131-1467)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPOUND:** PARATHION and Compressed Gas Mixtures  
**CODE:** 105

**CLASSIFICATION:** EXTREMELY TOXIC

## INHALATION TOXICITY

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<thead>
<tr>
<th>SPECIES</th>
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<th>REF.</th>
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<td></td>
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<tr>
<td>Rat</td>
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## ORAL TOXICITY

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<td>4-13 LD50</td>
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<td>3 ALD50</td>
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<td>32 LD50</td>
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<td>Mouse</td>
<td>25 LD50</td>
<td>105.3</td>
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## OTHER ROUTES OF ADMINISTRATION

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<td>I. P.</td>
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<td>150-420 ALD</td>
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<td>7-21 LD50</td>
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<td>105.5</td>
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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg

A-130
Although the data are somewhat conflicting, a large number of well-planned studies has shown that parathion acute, oral, and dermal toxicity values fall in the "Extremely Toxic" range. Furthermore, the estimated lethal dose for man falls in the "Extremely Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** PARIS GREEN, Solid  
(Copper Acetoarsenite)  
**CODE:** 106

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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<td>Rat</td>
<td>100</td>
<td>LD₅₀</td>
<td>106.1</td>
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### OTHER ROUTES OF ADMINISTRATION

<table>
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<th>SYS.**</th>
<th>REF.</th>
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<tr>
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<td>Skin</td>
<td>&gt;2400</td>
<td>LD₅₀</td>
<td>106.1</td>
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</table>

- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-132
Oral and dermal toxicity data fall within the "Toxic" classification.

REFERENCES:

## TOXICITY DATA SHEET

**COMPOUND:** PERCHLOROMETHYL MERCAPTAN  
**CODE:** 107

### CLASSIFICATION:  
**EXTREMELY TOXIC**

#### INHALATION TOXICITY

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<tbody>
<tr>
<td>Man (10min)</td>
<td>3000</td>
<td>(483)</td>
<td>Lethal</td>
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<tr>
<td>Rat</td>
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<tr>
<td>Mouse (15min)</td>
<td>360</td>
<td>(58)</td>
<td>Lethal</td>
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<td>Dog</td>
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<tr>
<td>Other</td>
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</tr>
<tr>
<td>Cat (15min)</td>
<td>360</td>
<td>(58)</td>
<td>Lethal</td>
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#### ORAL TOXICITY

<table>
<thead>
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### OTHER ROUTES OF ADMINISTRATION

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<td>6.</td>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

This compound falls in the "Extremely Toxic" classification.

REFERENCES:


107.2 Prentiss, A. M. Chemicals in War, 1937.
# Toxicity Data Sheet

**Compound:** Phenyldicyanamide Chloride  
**Code:** 108

**Classification:** Extremely Toxic

## Inhalation Toxicity

<table>
<thead>
<tr>
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<th>Sys.**</th>
<th>Ref.</th>
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</thead>
<tbody>
<tr>
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<td>50 (7)</td>
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<td>108.1</td>
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<tr>
<td>Rat</td>
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<tr>
<td>Mouse</td>
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<td>Dog</td>
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<tr>
<td>Other</td>
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## Oral Toxicity

<table>
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<th>Dose***</th>
<th>Sys.**</th>
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## Other Routes of Administration

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</tbody>
</table>

* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

The acute inhalation toxicity value for this deep lung irritant falls within the "Extremely Toxic" classification.

REFERENCES:

108. 1 Prentiss, A. M., Chemicals in War, 1937.
**TOXICITY DATA SHEET**

**COMPOUND:** PHENYLDICHLOOROARSINE  
**CODE:** 109

**CLASSIFICATION:** **EXTREMELY TOXIC**

### INHALATION TOXICITY

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<tr>
<td>Mouse</td>
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<tr>
<td>Other-GP</td>
<td>370 (41)</td>
<td>MLC</td>
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<td>(10min)</td>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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<th>REF.</th>
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<tr>
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<td>109.2</td>
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</tbody>
</table>

* Concentration in mg/M^3. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

---

A-138
JUSTIFICATION:

The inhalation and dermal toxicity data fall within the " Extremely Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** PHOSGENE (CARBONYL CHLORIDE)

**CLASSIFICATION:**

**EXTREMELY TOXIC**

### Inhalation Toxicity

<table>
<thead>
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<th>SPECIES</th>
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<th>SYS.</th>
<th>REF.</th>
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<tbody>
<tr>
<td>Man</td>
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</tr>
<tr>
<td>Rat (30min)</td>
<td>300 (75)</td>
<td>LC50</td>
<td>110, 3</td>
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<td>Dog (30min)</td>
<td>710 (75)</td>
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<td>110, 2</td>
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<td>Dog (30min)</td>
<td>320 (79)</td>
<td>Lethal</td>
<td>110, 1</td>
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<td>Monkey (1min)</td>
<td>4,440 (1087)</td>
<td>LC50</td>
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<td>Other Cat</td>
<td>6000 (482)</td>
<td>LC50</td>
<td>110, 3</td>
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<tr>
<td>Rabbit (1min)</td>
<td>13000 (3211)</td>
<td>LC50</td>
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<td>GI (30min)</td>
<td>570 (141)</td>
<td>LC50</td>
<td>110, 3</td>
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### Oral Toxicity

<table>
<thead>
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</tr>
<tr>
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<td></td>
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<tr>
<td>Mouse</td>
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<tr>
<td>Cat</td>
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<tr>
<td>Guinea Pig</td>
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### Other Routes of Administration

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</table>

- Concentration in mg/M³. Parenthetical values are PPM.
- ** System for expression of toxicity
- ***Dose in mg/Kg
Inhalation toxicity data fall in the "Extremely Toxic" classification.

REFERENCES:

110.3 Moore, S. and M. Gates, Summary Tech. Rept. of Division 9, NDRC, Vol 1, 1946.
**TOXICITY DATA SHEET**

**COMPOUND:** POTASSIUM ARSENITE  
**CODE:** 113

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-142
JUSTIFICATION:

Rat oral toxicity data falls in the "Highly Toxic" classification.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: SODIUM ARSENITE

CLASSIFICATION: HIGHLY TOXIC

INHALATION TOXICITY

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ORAL TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-144
Data fall within "Highly Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPUND: SODIUM AZIDE**

**CLASSIFICATION:** HIGHLY TOXIC

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M^3

** System for expression of toxicity

***Dose in mg/Kg
JUSTIFICATION:

Data falls within "Highly Toxic" classification.

REFERENCES:


**TOXICITY DATA SHEET**

**COMPounder: STRYCHNINE and SALTS THEREOF**  
**CODE: 119**

**CLASSIFICATION:**  
**EXTREMELY TOXIC**

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**INHALATION TOXICITY**

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**ORAL TOXICITY**

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**OTHER ROUTES OF ADMINISTRATION**

- Concentration in mg/M³  
- System for expression of toxicity  
- Dose in mg/Kg

A-148
Oral toxicity data places this compound in the "Extremely Toxic" category.

REFERENCES:

119.6 Orhalde, M. J., 4: 7b: 1401.
TOXICITY DATA SHEET

COMPOUND: TETRAETHYL DITHIOPYROPHOSPHATE, CODE: 120

CLASSIFICATION: EXTREMELY TOXIC

INHALATION TOXICITY

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ORAL TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Oral toxicity data fall in "Extremely Toxic" classification.

REFERENCES

120. 1 Metcalf, R. L., Organic Insecticides, 1955.
120. 2 Toy, A. D. F., J. A. C. S., 73:4670, 1951.
**TOXICITY DATA SHEET**

**COMPOUND:** TETRAETHYL DITHIOPYROPHOSPHATE  
**MIXTURES, DRY OR LIQUID**  
**CODE:** 121

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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See Data Sheet No. 120

### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-152
JUSTIFICATION:
See data sheet 120.

REFERENCES:
See data sheet 120.
TOXICITY DATA SHEET

COMPOUND: TETRAETHYL LEAD

CLASSIFICATION: HIGHLY TOXIC

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-154
Oral and inhalation data fall in "Highly Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPUND:** TETRAETHYL PYROPHOSPHATE AND COMPRESSED GAS MIXTURES  
**CODE:** 123

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg

A-156
JUSTIFICATION:

Data all fall in "Extremely Toxic" classification.

REFERENCES:

## TOXICITY DATA SHEET

**COMPOUND:** TETRAETHYL PYROPHOSPHATE (MIXTURE, DRY)  
**CODE:** 124

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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See Data Sheet Number 123

### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/m³
- System for expression of toxicity
- ***Dose in mg/Kg

A-158
JUSTIFICATION:
See data sheet 123.

REFERENCES:
See data sheet 123.
# TOXICITY DATA SHEET

## COMPOUND: THALLIUM SULFATE  
**CODE:** 125

## CLASSIFICATION: HIGHLY TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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<td>6.</td>
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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg

A-160
JUSTIFICATION:

Oral toxicity data fall in "Highly Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPUND: XYLYL BROMIDE

CODE: 127

CLASSIFICATION: HIGHLY TOXIC

### INHALATION TOXICITY

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<tbody>
<tr>
<td>Man (10 min) 5600 (75)</td>
<td>Lethal</td>
<td>127.1</td>
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<tr>
<td>Rat</td>
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### ORAL TOXICITY

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<td>Monkey</td>
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### OTHER ROUTES OF ADMINISTRATION

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</tbody>
</table>

- Concentration in mg/M\(^3\). Parenthetical value is PPM.
- ** System for expression of toxicity
- ***Dose in mg/Kg

A-152
JUSTIFICATION:

The extrapolated lethal concentration falls in the "Highly Toxic" range.

REFERENCES:

127.1 Prentiss, A. M., Chemicals in War, 1937.
TOXICITY DATA SHEET

COMPOUND: ACROLEIN (Acrylaldehyde) CODE: 131

CLASSIFICATION: EXTREMELY TOXIC

### INHALATION TOXICITY

<table>
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<tbody>
<tr>
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<td>350 (153)</td>
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<tr>
<td>Rat(4hr)</td>
<td>20 (8)</td>
<td>ALC50</td>
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<td>Mouse</td>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-164
JUSTIFICATION:

Extrapolated 1 hour inhalation toxicity falls in "Extremely Toxic" category.

REFERENCES:

131.4 Prentiss, A. M., Chemicals in War, 1937.
**TOXICITY DATA SHEET**

**COMPOUND:** ACRYLONITRILE  
**CODE:** 132

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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<tr>
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<td>3230 (1489)</td>
<td>Lethal</td>
<td>132.2</td>
</tr>
<tr>
<td>Rat (4hr)</td>
<td>2170 (1000)</td>
<td>LC100</td>
<td>132.1</td>
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<tr>
<td>(4hr)</td>
<td>680 (313)</td>
<td>ALC50</td>
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<td>Mouse (1hr)</td>
<td>1700 (784)</td>
<td>LC100</td>
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### ORAL TOXICITY

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<td>Guinea Pig</td>
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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
The bulk of the data falls in the "Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: ALLYL CHLORIDE
(3-Chloropropene)

CLASSIFICATION: TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M^3. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

All data falls within "Toxic" range.

REFERENCES:

# TOXICITY DATA SHEET

**COMPOUND:** ALUMINUM FERROSILICON  
(Data are for Phosphine and Arsine -  
See Data Sheet Number 168)

**CODE:** 134

**CLASSIFICATION:** EXTREMELY TOXIC

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See Data Sheet Number 168

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:
See data sheet 168.

REFERENCES:
See data sheet 168.
**TOXICITY DATA SHEET**

**COMPUND:** AMMONIA  
**CODE:** 135

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:
The majority of the literature inhalation toxicity data falls in the "Toxic" category as does the following data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory:

**Rat**
1-hour LC$_{50}$ = 5100 mg/M$^3$ or 7338 PPM

**Mouse**
1-hour LC$_{50}$ = 3360 mg/M$^3$ or 4837 PPM

REFERENCES:
TOXICITY DATA SHEET

COMPOUND: CARBON DIOXIDE and ETHYLENE OXIDE
MIXTURES (less than 10% Carbon Dioxide)

CODE: 148

CLASSIFICATION: TOXIC

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See Data Sheet Number 166

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-174
JUSTIFICATION:
Ethylene oxide is the more toxic component in the mixture, so toxicity is rated on ethylene oxide basis.

REFERENCES:
See data sheet 166.
**TOXICITY DATA SHEET**

**COMPOUND:** CARBON DISULFIDE  
**CODE:** 149

**CLASSIFICATION:** 
TOXIC

### INHALATION TOXICITY

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<td>Cat(48min)</td>
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* Concentration in mg/M³ Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

A-176
The data falls in the "Toxic" category.

REFERENCES:
149.1 Lehmann, K. B., Arch. f. Hyg., 20:26, 1894.
**TOXICITY DATA SHEET**

**COMPUND:** CARBON MONOXIDE  
**CODE:** 150

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:
The data fall in the "Toxic" category.

REFERENCES:
150.2 Flury, F. and F. Zernik, Abderhalden's Hdb., 4.7b, 1360.
TOXICITY DATA SHEET

COMPOUND: CARBON TETRACHLORIDE  
CODE: 151

CLASSIFICATION: TOXIC

### INHALATION TOXICITY

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<thead>
<tr>
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<td>120,000</td>
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<tr>
<td></td>
<td>(9056)</td>
<td>(measured)</td>
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<td>Mouse (7hr)</td>
<td>49,000</td>
<td>LC50</td>
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<td>Cat (2hr)</td>
<td>240,000</td>
<td>Lethal</td>
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<td>(38,110)</td>
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### ORAL TOXICITY

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<td>MLD</td>
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<td>Other-Rabbit</td>
<td>640</td>
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<td>3000</td>
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<td>I.P.</td>
<td>4620</td>
<td>LD50</td>
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* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-180
JUSTIFICATION:

All data fall in "Toxic" category.

REFERENCES:

151. 5 Flury, F. and F. Zernik, Abderhalden's Hdb., 4.7b:1405.
TOXICITY DATA SHEET

COMPOUND: CHLORINE  
CODE: 152

CLASSIFICATION: HIGHLY TOXIC

### INHALATION TOXICITY

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<td>397 (137) LC50</td>
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<td>2320 (800) Lethal</td>
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<td>Cat (1hr)</td>
<td>400-900 Lethal</td>
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<td>Mouse</td>
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<td>Dog</td>
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<td>Cat</td>
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<td>Guinea Pig</td>
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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M3. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-182
JUSTIFICATION:

The following data were generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory:

**Rat**
1 hour LC$_{50}$ = 850 mg/m$^3$ or 293 ppm
95% Confidence Limits 754-955 mg/m$^3$ or 260-329 ppm

**Mouse**
1 Hour LC$_{50}$ = 397 mg/m$^3$ or 137 ppm
95% Confidence Limits 346-462 mg/m$^3$ or 119-159 ppm

Data fall in "Highly Toxic" category.

REFERENCES:

152.2 Lehmann, K. B., Arch. f. Hyg., 7:233, 1887.
152.3 Prentiss, A. M., Chemicals in War, McGrall-Hill, N. Y., 1937.
# TOXICITY DATA SHEET

**COMPOUND:** CHLORINE TRIFLUORIDE  
**CODE:** 153

**CLASSIFICATION:** **HIGHLY TOXIC**

## INHALATION TOXICITY

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<tbody>
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<td>361 (95)</td>
<td>LC50</td>
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<td>Rat (1hr)</td>
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<td>ALC50</td>
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<td>Mouse (1hr)</td>
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<td>Dog</td>
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<tr>
<td>Monkey (1hr)</td>
<td>865 (227)</td>
<td>LC50</td>
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## ORAL TOXICITY

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<td>Guinea Pig</td>
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## OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

The data all fall into the "Highly Toxic" category.

REFERENCES:


**TOXICITY DATA SHEET**

**COMPOUND: CHLOROPICRIN and METHYL CHLORIDE MIXTURES**

**CODE: 154**

**CLASSIFICATION:** **EXTREMELY TOXIC**

### INHALATION TOXICITY

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See Data Sheet Number 029 for Chloropicrin Toxicity.

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-186
JUSTIFICATION:

Based on chloropicrin acute toxicity data, which is the most toxic compound of the mixture, it falls in the "Extremely Toxic" classification.

REFERENCES:

See data sheet 029.
TOXICITY DATA SHEET

COMPOUND: CHLOROPRENE
(2-Chlorobutadiene, -1,3), INHIBITED

CODE: 155

CLASSIFICATION: TOXIC

INHALATION TOXICITY

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<td>2200 (605)</td>
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<td>(8hr)</td>
<td>600 (65)</td>
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<td>Cat(8hr)</td>
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ORAL TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg A-188
JUSTIFICATION:

Data falls in "Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** COAL GAS

**CODE:** 156

**CLASSIFICATION:** TOXIC

### Inhalation Toxicity

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See Data Sheet Number 150

### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Since coal gas contains approximately 9% carbon monoxide which is the most toxic constituent, it is classified "Toxic."

REFERENCES:

See data sheet 150.
**TOXICITY DATA SHEET**

**COMPRESS**: CYANOGEN, Liquefied, \((CN_2)\)

**CLASSIFICATION**: TOXIC

### INHALATION TOXICITY

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See Data Sheet Number 39

### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

A-192
JUSTIFICATION:

Release of cyanogen, liquefied, results in the formation of cyanogen gas, No. 039.

REFERENCES:

See data sheet 039.
TOXICITY DATA SHEET

COMPOUND: CYCLONITE (CYCLOTETRIMETHYLENE-TRINITRIMINE, OR HEXOGEN, OR R.D.X.)
CODE: 159

CLASSIFICATION: TOXIC

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<td>200</td>
<td>MLD50</td>
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OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg
The acute oral toxicity for the rat falls in the "Toxic" category. Although bizarre human effects have been reported from the inhalation or ingestion of this compound or a related mixture of cyclonite in a plastic explosive, (C-4), doses as high as 2600 mg/kg have not been lethal (159.2). The effects on the nervous system include convulsive seizures. This response has also been reported in men chronically exposed to cyclonite in the manufacturing process (159.3, 159.4), again with non-lethal results. von Oettingen also reported this finding in dogs fed 50 mg/kg of cyclonite on a daily schedule.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOUND:** DECABORANE  
**CODE:** 160

**CLASSIFICATION:** **HIGHLY TOXIC**

### Inhalation Toxicity

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.</th>
<th>SYS.</th>
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</tr>
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<tbody>
<tr>
<td>Man</td>
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</tr>
<tr>
<td>Rat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse (4hr)</td>
<td>122 (24)</td>
<td>LC50</td>
<td>160.1</td>
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<td>Dog</td>
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<td>Monkey</td>
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### Oral Toxicity

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<tbody>
<tr>
<td>Man</td>
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</tr>
<tr>
<td>Rat</td>
<td>100</td>
<td>ALD100</td>
<td>160.2</td>
</tr>
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<td>Mouse</td>
<td>40</td>
<td>ALD50</td>
<td>160.2</td>
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<td>Guinea Pig</td>
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### Other Routes of Administration

<table>
<thead>
<tr>
<th>SPECIES</th>
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<th>DOSE</th>
<th>SYS.</th>
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<tbody>
<tr>
<td>1. Mouse</td>
<td>I. P.</td>
<td>31.6</td>
<td>ALD50</td>
<td>160.2</td>
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<tr>
<td>2. Rabbit</td>
<td>Skin</td>
<td>32-63</td>
<td>ALD50</td>
<td>160.2</td>
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<td>3. Rat</td>
<td>Skin</td>
<td>795</td>
<td>LD100</td>
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<td>4. Dog</td>
<td>I. P.</td>
<td>10-20</td>
<td>Lethal</td>
<td>160.3</td>
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</table>

* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg

A-196
Based on rabbit dermal toxicity, decaborane is classified as "Highly Toxic."

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: DIBORANE

CLASSIFICATION: EXTREMELY TOXIC

### Inhalation Toxicity

<table>
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<th>SPECIES</th>
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<td>Man (15min)</td>
<td>175-200 (159-181)</td>
<td>LC50</td>
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<td>Rat (4hr)</td>
<td>45-94 (41-82)</td>
<td>LC50</td>
<td>161.2</td>
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<td>Mouse (4hr)</td>
<td>33 (30)</td>
<td>LC50</td>
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<td>Dog</td>
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<tr>
<td>GP (10-1/2hr)</td>
<td>58 (53)</td>
<td>ALC100</td>
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### Oral Toxicity

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* Concentration in mg/M^3. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-198
JUSTIFICATION:

Inhalation data fall into "Extremely Toxic" category.

REFERENCES:

### TOXICITY DATA SHEET

**COMPOUND:** 1,1-DIFLUOROETHYLENE  
(Vinylidene Fluoride)  
**CODE:** 162

**CLASSIFICATION:** "BELOW" TOXIC

#### INHALATION TOXICITY

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<td>(128,352)</td>
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#### ORAL TOXICITY

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</table>

* Concentration in mg/M^3. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

Acute inhalation toxicity data fall below "Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPONENT:** DINITROPHENOL, Dry or Containing less than 15% Water  
**CODE:** 163

**CLASSIFICATION:** HIGHLY TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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</tr>
<tr>
<td>Rat</td>
<td>100</td>
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<td>163.1</td>
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<td>Mouse</td>
<td>30</td>
<td>Lethal</td>
<td>163.2</td>
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<td>50</td>
<td>Lethal</td>
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### Other Routes of Administration

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<td>Skin</td>
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<td>S. C.</td>
<td>25</td>
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<td>163.2</td>
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<td>50</td>
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<td>163.3</td>
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<td>N</td>
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<td>163.3</td>
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</tbody>
</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg

A-202
JUSTIFICATION:

The data fall within the "Highly Toxic" classification.

REFERENCES:


## TOXICITY DATA SHEET

**COMPUND:** ETHYLENE OXIDE  
**CODE:** 166

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

<table>
<thead>
<tr>
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<th>SYS.(\text{**})</th>
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<tbody>
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<td>Man (4hr)</td>
<td>7200 (4000)</td>
<td>LC(_{50})</td>
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<td>Rat (4hr)</td>
<td>2630 (1462)</td>
<td>LC(_{50})</td>
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<td>Mouse (4hr)</td>
<td>1504 (836)</td>
<td>LC(_{50})</td>
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<td>1750 (973)</td>
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<tr>
<td>GP (2-1/2hr)</td>
<td>12,600 (7,000)</td>
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### ORAL TOXICITY

<table>
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<td>Cat</td>
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<td>Guinea Pig</td>
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### OTHER ROUTES OF ADMINISTRATION

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</table>

\(\text{* Concentration in mg/M}^3.\) Parenthetical values are PPM.

\(\text{** System for expression of toxicity}\)

\(\text{***Dose in mg/Kg}\)

A-204
JUSTIFICATION:

Inhalation data fall in the "Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: ETHYLENEIMINE, Inhibited

CLASSIFICATION: EXTREMELY TOXIC

<table>
<thead>
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<th>REF.</th>
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<tbody>
<tr>
<td>Man</td>
<td>109 (62)</td>
<td>ALC50</td>
<td>167.4</td>
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<tr>
<td>Rat (1hr)</td>
<td>440 (250)</td>
<td>ALC50</td>
<td>167.2</td>
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<td>Mouse (10min)</td>
<td>3930 (2230)</td>
<td>LC50</td>
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<tr>
<td>Other</td>
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<tr>
<td>GP (1hr)</td>
<td>440 (250)</td>
<td>ALC50</td>
<td>167.2</td>
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<table>
<thead>
<tr>
<th>SPECIES</th>
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<th>SYS.**</th>
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<td>15</td>
<td>ALD50</td>
<td>167.1</td>
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<td>Mouse</td>
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<td>Dog</td>
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<tr>
<td>Cat</td>
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<tr>
<td>Guinea Pig</td>
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OTHER ROUTES OF ADMINISTRATION

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<tr>
<td>Guinea Pig</td>
<td>Skin</td>
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<td>ALD50</td>
<td>167.1</td>
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</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

Although the oral data fall in the "Highly Toxic" category, the dermal toxicity of this volatile liquid is high enough to characterize it as "Extremely Toxic."

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: FERROSILICON
(Data are for Phosphine and Arsine)

CLASSIFICATION: EXTREMELY TOXIC

<table>
<thead>
<tr>
<th>SPECIES</th>
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<tbody>
<tr>
<td>Man</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rat(1hr)</td>
<td>800 (580)</td>
<td>Lethal</td>
<td>168.1</td>
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<tr>
<td>Mouse²(50min)</td>
<td>100 (72)</td>
<td>LC₅₀</td>
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<td>Dog</td>
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<tr>
<td>Monkey²(15min)</td>
<td>450 (320)</td>
<td>LC₈₀</td>
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<tr>
<td>Other</td>
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<tr>
<td>Cat¹(2hr)</td>
<td>240 (73)</td>
<td>Lethal</td>
<td>168.1</td>
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<tr>
<td>Rabbit²(30min)</td>
<td>450 (320)</td>
<td>AL₅₀</td>
<td>168.3</td>
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<tr>
<td>GP¹(2hr)</td>
<td>400 (288)</td>
<td>Lethal</td>
<td>168.1</td>
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OTHER ROUTES OF ADMINISTRATION

<table>
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</tbody>
</table>

1. Phosphine Data
2. Arsine Data
* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-208
Ferrosilicon and Aluminum Ferrosilicon containing over 30% silicon liberate phosphine and arsine in the presence of water or moist air as on ships or in the manufacture of steel. The inhalation toxicity data for phosphine and arsine both fall in the "Extremely Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: FLUORINE

CLASSIFICATION: EXREMELY TOXIC

### INHALATION TOXICITY

<table>
<thead>
<tr>
<th>SPECIES</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Rat (1hr)</td>
<td>287 (185)</td>
<td>LC50</td>
<td>169.1</td>
</tr>
<tr>
<td>Mouse (1hr)</td>
<td>233 (150)</td>
<td>LC50</td>
<td>169.1</td>
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<td>Dog</td>
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<td></td>
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<tr>
<td>Monkey</td>
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<tr>
<td>Other</td>
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<tr>
<td>GP (1hr)</td>
<td>264 (170)</td>
<td>LC50</td>
<td>169.1</td>
</tr>
<tr>
<td>Rabbit (30min)</td>
<td>420 (270)</td>
<td>LC50</td>
<td>169.1</td>
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### ORAL TOXICITY

<table>
<thead>
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<td>Dog</td>
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<td>Monkey</td>
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<td>Cat</td>
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<tr>
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<td>Other</td>
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### OTHER ROUTES OF ADMINISTRATION

<table>
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<tr>
<th>SPECIES</th>
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<tbody>
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<tr>
<td>6.</td>
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<td></td>
</tr>
</tbody>
</table>

* Concentration in mg/M^3. Parenthetical values are PPM.
** System for expression of toxicity
*** Dose in mg/Kg
JUSTIFICATION:

The data fall in the "Extremely Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: HYDRAZINE, ANHYDROUS

CLASSIFICATION: HIGHLY TOXIC

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<td>Rat(4hr)</td>
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<td>LD50</td>
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<tr>
<td>Rat(4hr)</td>
<td>750 (573)</td>
<td>LC50</td>
<td>171.4</td>
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OTHER ROUTES OF ADMINISTRATION

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<th>SYS.**</th>
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<td>4. Mouse</td>
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<td>6. Rat</td>
<td>L.P.</td>
<td>59</td>
<td>LD50</td>
<td>171.3</td>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical values are PPM.
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:

All data fall in the "Highly Toxic" classification.

REFERENCES:

# TOXICITY DATA SHEET

**COMPOUND:** HYDROFLUORIC ACID, Solution  
**CODE:** 172

**CLASSIFICATION:** HIGHLY TOXIC

<table>
<thead>
<tr>
<th>INHALATION TOXICITY</th>
<th>GRAL TOXICITY</th>
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<td>See Data Sheet Number 174</td>
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<td>5.</td>
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<td>6.</td>
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</tbody>
</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

Hydrofluoric acid spilled from its container would rapidly evolve hydrogen fluoride gas which is, in turn, "Highly Toxic" by the inhalation route.

REFERENCES:

See data sheet 174.
## TOXICITY DATA SHEET

**COMPOUND:** HYDROGEN BROMIDE, Anhydrous  
**CODE:** 173

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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<td>9450 (2858) LC50</td>
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<td>2690 (814) LC50</td>
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<td>Dog</td>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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<th>SPECIES</th>
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<th>DOSE***</th>
<th>SYS.**</th>
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</table>

* Concentration in mg/M³. Parenthetical values are PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

A-216
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1 Hour LC\textsubscript{50} = 9450 mg/m\textsuperscript{3}

\hspace{2cm} 95\% Confidence Limits (8550-10,480) or 2858 ppm

\hspace{2cm} 2582-3164 ppm

Mouse 1 Hour LC\textsubscript{50} = 2690 mg/m\textsuperscript{3}

\hspace{2cm} 95\% Confidence Limits (2320-7135) or 814 ppm

\hspace{2cm} 701-947 ppm

Data fall in "Toxic" category.
## Toxicity Data Sheet

**Compound:** Hydrogen Fluoride, Anhydrous  
**Code:** 174

**Classification:** Highly Toxic

### Inhalation Toxicity

<table>
<thead>
<tr>
<th>Species</th>
<th>Conc.</th>
<th>Sys.</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man (1hr)</td>
<td>1075 (1315)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>174.2</td>
</tr>
<tr>
<td>Rat (1hr)</td>
<td>1045 (1278)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>174.1</td>
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<tr>
<td>Mouse (1hr)</td>
<td>410 (500)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>174.1</td>
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<td>Dog</td>
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<tr>
<td>Monkey (1hr)</td>
<td>1455 (1780)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>174.1</td>
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<tr>
<td>GP (15min)</td>
<td>3550 (4342)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>174.2</td>
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### Oral Toxicity

<table>
<thead>
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<th>Species</th>
<th>Dose</th>
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### Other Routes of Administration

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</table>

* Concentration in mg/m<sup>3</sup>. Parenthetical values are PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
Inhalation toxicity data fall within the "Highly Toxic" classification.

REFERENCES:


**TOXICITY DATA SHEET**

**COMPOUND:** HYDROGEN SULFIDE  
**CODE:** 175

**CLASSIFICATION:** HIGHLY TOXIC

### INHALATION TOXICITY

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC. *</th>
<th>SYS. **</th>
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<tbody>
<tr>
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<td></td>
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</tr>
<tr>
<td>Rat(lhr)</td>
<td>990 (713)</td>
<td>LC$_{50}$</td>
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<tr>
<td>Mouse(lhr)</td>
<td>925 (673)</td>
<td>LC$_{50}$</td>
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<td>Dog</td>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</tbody>
</table>

* Concentration in mg/M$^3$. Parenthetical values are PPM,
** System for expression of toxicity
***Dose in mg/Kg

A-220
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC$_{50}$ = 990 mg/m$^3$
95% Confidence Limits (916-1068) or 713 ppm
660-769 ppm

Mouse 1-Hour LC$_{50}$ = 925 mg/m$^3$
95% Confidence Limits (833-1047) or 673 ppm
599-754 ppm

Data fall in "Highly Toxic" category.
TOXICITY DATA SHEET

COMPOUND: IRON PENTACARBONYL

CLASSIFICATION: HIGHLY TOXIC

### INHALATION TOXICITY

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC. *</th>
<th>SYS. **</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>265 (33)</td>
<td>ALC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>176.2</td>
</tr>
<tr>
<td>Rat</td>
<td>910 (13)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>176.1</td>
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<tr>
<td>Mouse</td>
<td>2190 (273)</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>176.1</td>
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<td>Dog</td>
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### ORAL TOXICITY

<table>
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<td>Rat</td>
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<tr>
<td>Other-Rabbit</td>
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<td>ALC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>176.3</td>
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### OTHER ROUTES OF ADMINISTRATION

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>ROUTE</th>
<th>DOSE***</th>
<th>SYS. **</th>
<th>REF.</th>
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<tbody>
<tr>
<td>1. Rabbit</td>
<td>I. V.</td>
<td>17</td>
<td>ALD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>176.3</td>
</tr>
</tbody>
</table>

* Concentration in mg/M<sup>3</sup>. Parenthetical values are PPM.
** System for expression of toxicity.
*** Dose in mg/Kg.
JUSTIFICATION:

Data falls within "Highly Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND: LEAD NITRATE**  
**CODE: 177**

**CLASSIFICATION:** *Toxic*

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg  

A-224
Only available data fall in "Toxic" category.

REFERENCES:

177.2 Tartler, G., Arch. Hyg., 125:273, 1941.
# TOXICITY DATA SHEET

**COMPOUND:** METHANOL  
**CODE:** 179

**CLASSIFICATION:** BELOW TOXIC

### Inhalation Toxicity

<table>
<thead>
<tr>
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### Oral Toxicity

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<td>Rat</td>
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</tr>
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<td>MLD</td>
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### Other Routes of Administration

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<td>15,900</td>
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</tr>
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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg  

---

A-226
JUSTIFICATION:

Oral data fall below the "Toxic" classification.

REFERENCES:

179.3 Flury, F. and F. Zernik, Abderhalden's Hdb., 4.7b:1365.
**TOXICITY DATA SHEET**

**COMPOUND:** NICKEL CARBONYL

**CODE:** 182

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

<table>
<thead>
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<td>400 (57)</td>
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</table>

* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-228
JUSTIFICATION:

Reliable inhalation toxicity data based on large numbers of animals fall in the "Extremely Toxic" classification.

REFERENCES:

182.1 Armit, H. W., J. Hygiene, 8:565, 1908.
TOXICITY DATA SHEET

COMPOUND: NITRIC ACID, RED FUMING  
CODE: 183

CLASSIFICATION: EXTREMELY TOXIC

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.*</th>
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<th>SPECIES</th>
<th>DOSE***</th>
<th>SYS.**</th>
<th>REF.</th>
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<tr>
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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg

A-230
The principal ingredient of fuming red nitric acid in atmospheric exposures is nitrogen dioxide. The acute inhalation toxicity data are consistent with those of nitrogen dioxide and fall into the "Extremely Toxic" category, to coincide with 095, 099-102.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: NITRIC OXIDE and NITROGEN TETROXIDE MIXTURES

CODE: 184

CLASSIFICATION: EXTREMELY TOXIC

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See Data Sheet Number 099

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M^3
** System for expression of toxicity
*** Dose in mg/Kg

A-232
JUSTIFICATION:

In the presence of air, the nitric oxide component would be rapidly converted to nitrogen dioxide - nitrogen tetroxide and have the toxicity of this substance.

REFERENCES:

See data sheet 099.
**TOXICITY DATA SHEET**

**COMPOUND:** NITROGLYCERIN (Desensitized with at least 40%, by weight, nonvolatile phlegmatiser)

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-234
JUSTIFICATION: Classification based on nitroglycerin toxicity only and falls in "Toxic" category.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOUND:** PHOSPHORUS, White or Yellow, Under Water or in Solution  
**CODE:** 187

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-236
Oral data fall in "Extremely Toxic" category.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPUND:** POTASSIUM BIFLUORIDE  
(Potassium Acid Fluoride)  
**CODE:** 188

**CLASSIFICATION:** TOXIC

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* Concentration in mg/M^3  
** System for expression of toxicity  
***Dose in mg/Kg

A-238
JUSTIFICATION:
Oral data place this compound in the "Toxic" category.

REFERENCES:
**TOXICITY DATA SHEET**

**COMPOND:** POTASSIUM FLUORIDE  
**CODE:** 189

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-240
JUSTIFICATION:

Oral data place this compound in the "Toxic" category.

REFERENCES:

# TOXICITY DATA SHEET

**COMPUND:** POTASSIUM PHOSPHIDE  
**CODE:** 190

**CLASSIFICATION:** EXTREMELY TOXIC

## Inhalation Toxicity

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See Data Sheet Number 168, Phosphine Data

## Oral Toxicity

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## Other Routes of Administration

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</table>

*Concentration in mg/M³  
**System for expression of toxicity  
***Dose in mg/Kg

A-242
JUSTIFICATION:

Potassium phosphide decomposes on contact with moisture to phosphine which is classified "Extremely Toxic."

REFERENCES:

See Reference 168.1
### TOXICITY DATA SHEET

**COMPOUND:** PYRIDINE  
**CODE:** 192

**CLASSIFICATION:** TOXIC

#### INHALATION TOXICITY

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<td>Rat (4hr) 12,000 (3708)</td>
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#### ORAL TOXICITY

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#### OTHER ROUTES OF ADMINISTRATION

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<td>I.P.</td>
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</table>

* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg

A-244
JUSTIFICATION:

Data fall in "Toxic" classification.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: SILICON TETRAFLUORIDE

CLASSIFICATION: TOXIC

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INHALATION TOXICITY

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ORAL TOXICITY

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</table>

OTHER ROUTES OF ADMINISTRATION

* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-246
JUSTIFICATION:

Inhalation data fall in "Toxic" category.

REFERENCES:

TOXICITY DATA SHEET

COMPOUND: SODIUM PHOSPHIDE

CLASSIFICATION: EXTREMELY TOXIC

### INHALATION TOXICITY

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See Data Sheet Number 168, Phosphine Data

### ORAL TOXICITY

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* Concentration in mg/M\(^3\)
** System for expression of toxicity
***Dose in mg/Kg

A-248
JUSTIFICATION:

Sodium phosphide decomposes on contact with moisture to phosphine which is classified "Extremely Toxic."

REFERENCES:

See Reference 168.1
## TOXICITY DATA SHEET

**COMPONENT:** STRONTIUM PHOSPHIDE  
**CODE:** 196

**CLASSIFICATION:** EXTREMELY TOXIC

### Inhalation Toxicity

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See Phosphine Data, Data Sheet Number 168.

### Oral Toxicity

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### Other Routes of Administration

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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg

A-250
Strontium phosphide, on contact with moisture, decomposes to phosphine which is classified "Extremely Toxic."

REFERENCES:
See Reference 168.1
**TOXICITY DATA SHEET**

**COMPOUND:** SULFUR DIOXIDE

**CODE:** 197

**CLASSIFICATION:** HIGHLY TOXIC

### Inhalation Toxicity

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<td>2600 (993)</td>
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<tr>
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<td>1600 (611)</td>
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<tr>
<td>Mouse (1hr)</td>
<td>1595 (609)</td>
<td>MLC</td>
<td>197.2</td>
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### Oral Toxicity

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### Other Routes of Administration

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</table>

* Concentration in mg/M³, Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg
Most of the data fall in the "Highly Toxic" classification.

REFERENCES:
197.1 Flury F. and F. Zernik, Abderhalden's Hdb., 4.7b, 1396.
**TOXICITY DATA SHEET**

**COMPOUND:** SULFURIC ACID, Fuming  
**CODE:** 198

**CLASSIFICATION:** EXTREMELY TOXIC

### Inhalation Toxicity

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<td>Old(8hr)</td>
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<tr>
<td>Young(1hr)</td>
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<td>LC50</td>
<td>198.1</td>
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### Oral Toxicity

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### Other Routes of Administration

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<th>ROUTE</th>
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</table>

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* Concentration in mg/M³ Particulate aerosol.  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Inhalation data fall in "Extremely Toxic" classification and inhalation is the most probable form of toxic exposure.

REFERENCES:

# Toxicity Data Sheet

**Compound:** Magnesium Phosphide  
**Code:** 200

**Classification:** Extremely Toxic

### Inhalation Toxicity

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See Data Sheet Number 168, Phosphine Data.

### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-256
JUSTIFICATION:

Magnesium phosphide, on contact with moisture, decomposes to phosphine which is classified "Extremely Toxic."

REFERENCES:

See Reference 168, 1
**TOXICITY DATA SHEET**

**COMPONENT:** ALUMINUM PHOSPHIDE (ALP)  
**CODE:** 201

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/M$^3$
- ** System for expression of toxicity
- ***Dose in mg/Kg

A-258
JUSTIFICATION:

Aluminum phosphide, on contact with moisture, decomposes to phosphine which is classified "Extremely Toxic."

REFERENCES:

See Reference 168.1
**TOXICITY DATA SHEET**

**COMPOUND:** ANILINE HYDROCHLORIDE  
**CODE:** 202

**CLASSIFICATION:** TOXIC

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-260
JUSTIFICATION:
Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1072 mg/kg
95% Confidence Limits (725-1585)

Mouse 14-Day LC$_{50}$ = 841 mg/kg
95% Confidence Limits (474-1493)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPUND:** BENZIDINE  
**CODE:** 203  

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M
** System for expression of toxicity  
***Dose in mg/Kg

A-262
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day $LD_{50} = 309 \text{ mg/kg}$
95% Confidence Limits (169-5424)

Mouse 14-Day $LD_{50} = 214 \text{ mg/kg}$
95% Confidence Limits (144-317)

Data fall in the "Toxic" category.
### TOXICITY DATA SHEET

**COMPOUND:** BENZYL CHLORIDE

**CODE:** 204

**CLASSIFICATION:** TOXIC

#### INHALATION TOXICITY

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*Rats and mice survived exposure to 2mg/liter concentrations for one hour. Air Force data.

#### ORAL TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-264
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1231 mg/kg
95% Confidence Limits (1145-1656)

Mouse 14-Day LD$_{50}$ = 1624 mg/kg
95% Confidence Limits (1153-2185)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPUND:** BENZYLIDINE CHLORIDE  
**CODE:** 205

**CLASSIFICATION:** TOXIC

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*Rats and mice survived exposure to 2mg/liter concentrations for one hour. Air Force data.

### ORAL TOXICITY

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*Concentration in mg/M³  
**System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:
Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD₅₀ = 3249 mg/kg  
95% Confidence Limits (2360-4473)

Mouse 14-Day LD₅₀ = 2462 mg/kg  
95% Confidence Limits (1788-3389)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPONENT:** O-CHLORONITROBENZENE  
**CODE:** 206

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-268
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 268 mg/kg
95% Confidence Limits (181-396)

Mouse 14-Day LD$_{50}$ = 135 mg/kg
95% Confidence Limits (110-200)

Data fall in the "Toxic" category.
## TOXICITY DATA SHEET

**COMPOUND:** P-CHLORONITROBENZENE  
**CODE:** 208

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-270
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD_{50} = 812 mg/kg
95% Confidence Limits (590-1118)

Mouse 14-Day LD_{50} = 1414 mg/kg
95% Confidence Limits (1070-2044)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOUND: DIMETHYL SULFATE  
CODE: 209

CLASSIFICATION:  **EXTREMELY TOXIC**

### INHALATION TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-272
JUSTIFICATION:

Extropolation values of the acute inhalation toxicity data fall in the "Extremely Toxic" classification.

REFERENCES:

### TOXICITY DATA SHEET

**COMPOUND:** 4,6-DINITRO-ORTHO-CRESOL  
**CODE:** 214

**CLASSIFICATION:** HIGHLY TOXIC

#### INHALATION TOXICITY

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- Concentration in mg/M³
- ** System for expression of toxicity
- ***Dose in mg/Kg

A-274
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 33 mg/kg
95% Confidence Limits (22-49)

Mouse 14-Day LD$_{50}$ = 21 mg/kg
95% Confidence Limits (12-37)

Data fall in the "Highly Toxic" category.
**TOXICITY DATA SHEET**

**COMPONENT:** 2,3-DINITROTOLUENE  
**CODE:** 216

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50} = 1122$ mg/kg
95% Confidence Limits (501-2516)

Mouse 14-Day LD$_{50} = 1072$ mg/kg
95% Confidence Limits (725-1585)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** 2,4-DINITROTOLUENE  
**CODE:** 217

**CLASSIFICATION:** TOXIC

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* Concentration in mg/M^3  
** System for expression of toxicity  
*** Dose in mg/Kg

A-278
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD₅₀ = 268 mg/kg
95% Confidence Limits (181-396)

Mouse 14-Day LD₅₀ = 1625 mg/kg
95% Confidence Limits (1180-2236)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** 2,5-DINITROTOLUENE  
**CODE:** 218

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg

A-280
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the
United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD50 = 707 mg/kg
95% Confidence Limits (513-974)

Mouse 14-Day LD50 = 1231 mg/kg
95% Confidence Limits (730-2077)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPOUND:** 2,6-DINITROTOLUENE  
**CODE:** 219

**CLASSIFICATION:** TOXIC

## Inhalation Toxicity

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## Oral Toxicity

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## Other Routes of Administration

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* Concentration in mg/M$^3$
** System for expression of toxicity
*** Dose in mg/Kg

A-282
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50} = 177$ mg/kg
95% Confidence Limits (128-243)

Mouse 14-Day LD$_{50} = 1000$ mg/kg
95% Confidence Limits (589-1697)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** 3, 4-DINITROTOLUENE  
**CODE:** 220

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1072 mg/kg
95% Confidence Limits (725-1585)

Mouse 14-Day LD$_{50}$ = 1414 mg/kg
95% Confidence Limits (457-4379)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPounder:** EPICHLORoHYDRIN  
**CODE:** 222

## CLASSIFICATION: Toxic

### Inhalation Toxicity

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<td>Rat (Shr)</td>
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<td>Mouse (Min)</td>
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<td>ALC100</td>
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### Oral Toxicity

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<td>LD50</td>
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<td>Dog</td>
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<td>Cat</td>
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### Other Routes of Administration

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</table>

* Concentration in mg/M³, Parenthetical value is PPM.  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

Acute toxicity data fall in the "Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPOUND:** ETHYLENE CHLOROHYDRIN  
**CODE:** 224

**CLASSIFICATION:** EXTREMELY TOXIC

### INHALATION TOXICITY

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<td>Rat (4hr)</td>
<td>108 (33)</td>
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<td>224.3</td>
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<td>Mouse</td>
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### ORAL TOXICITY

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<td>95</td>
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<td>116</td>
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### OTHER ROUTES OF ADMINISTRATION

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<tr>
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<td>Skin</td>
<td>83.4</td>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
***Dose in mg/Kg

A-288
Human fatal exposures have been reported resulting from air concentrations around 1000 mg/M$^3$ ethylene chlorohydrin, (224.4, 224.5) and serious central nervous system effects have been reported from inhalation exposures as low as 59 mg/M$^3$ (224.6). Because of these reported human injuries and the acute inhalation ALC$\text{_{50}}$ in the rat of 33 ppm (108 mg/M$^3$), ethylene chlorohydrin is classified as "Extremely Toxic."

REFERENCES:

# Toxicity Data Sheet

**Compound:** Ethylene Dibromide  
**Code:** 225

**Classification:** Toxic

### Inhalation Toxicity

<table>
<thead>
<tr>
<th>Species</th>
<th>Concentration</th>
<th>System</th>
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<tbody>
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<td>Man</td>
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</tr>
<tr>
<td>Rat (1hr)</td>
<td>5300 (691)</td>
<td>LC₅₀</td>
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<td>Mouse</td>
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<td>GP (3hr)</td>
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### Oral Toxicity

<table>
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### Other Routes of Administration

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<th>System</th>
<th>Ref.</th>
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</tbody>
</table>

* Concentration in mg/M³. Parenthetical value is PPM/PPM.
* System for expression of toxicity.
* Dose in mg/Kg.
Acute toxicity data fall within the range for the "Toxic" classification.

REFERENCES:

**TOXICITY DATA SHEET**

**COMPONENT:** ETHYLENEDIAMINE 

**CODE:** 226

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

<table>
<thead>
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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

- Concentration in mg/M³ Parenthetical value is PPM.
- System for expression of toxicity
- Dose in mg/Kg

A-292
JUSTIFICATION:

Oral dermal and inhalation toxicity data fall in the "Toxic" classification.

REFERENCES:


**TOXICITY DATA SHEET**

**COMPOUND:** 2,2'-DITHIOBISBENZOTHIAZOLE  
**CODE:** 227

**CLASSIFICATION:** BELOW TOXIC

### INHALATION TOXICITY

<table>
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### ORAL TOXICITY

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<tr>
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<td>Mouse</td>
<td>&gt;12,000</td>
<td>LD₅₀</td>
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### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/m³
- System for expression of toxicity
- Dose in mg/Kg

A-294
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ => 12,000

Mouse 14-Day LD$_{50}$ =>12,000

Data are below the "Toxic" category.
# Toxicity Data Sheet

**Compound:** M-Nitroaniline  
**Code:** 228

**Classification:** Toxic

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-296
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 535 mg/kg
95% Confidence Limits (362-793)

Mouse 14-Day LD$_{50}$ = 308 mg/kg
95% Confidence Limits (228-416)

Data fall in the "Toxic" category.
## TOXICITY DATA SHEET

**COMPOUND:** P-NITROANILINE  
**CODE:** 229

### CLASSIFICATION: TOXIC

#### INHALATION TOXICITY

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#### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-298
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 3249 mg/kg
95% Confidence Limits (1984-5702)

Mouse 14-Day LD$_{50}$ = 812 mg/kg
95% Confidence Limits (590-1118)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOUND: O-NITROPHENOL

CODE: 230

CLASSIFICATION: TOXIC

INHALATION TOXICITY

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* Concentration in mg/M$^3$
** System for expression of toxicity
*** Dose in mg/Kg

A-300
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 2828 mg/kg
95% Confidence Limits (2054-3894)

Mouse 14-Day LD$_{50}$ = 1297 mg/kg
95% Confidence Limits (894-1695)

Data fall in the "Toxic" category.
## TOXICITY DATA SHEET

**COMPUND:** M-NITROPHENOL  
**CODE:** 231

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 933 mg/kg
95% Confidence Limits (645-1351)

Mouse 14-Day LD$_{50}$ = 1414 mg/kg
95% Confidence Limits (125-10,270)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPUND:** P-NITROPHENOL  
**CODE:** 232

**CLASSIFICATION:** TOXIC

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M<sup>3</sup>  
** System for expression of toxicity  
***Dose in mg/Kg

A-304
JUSTIFICATION:

Data generated under contract between the Department of Transportation and United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 616 mg/kg
95% Confidence Limits (447-848)

Mouse 14-Day LD$_{50}$ = 467 mg/kg
95% Confidence Limits (315-690)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOUND: O-NITROTOLUENE

CLASSIFICATION: TOXIC

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INHALATION TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M^3
** System for expression of toxicity
*** Dose in mg/Kg

A-306
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD50 = 891 mg/kg
95% Confidence Limits (500-1584)

Mouse 14-Day LD50 = 2462 mg/kg
95% Confidence Limits (1789-3390)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** M-NITROTOLUENE  
**CODE:** 234

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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* Concentration in mg/M³

### ORAL TOXICITY

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* Dose in mg/Kg

### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³

**System for expression of toxicity**

A-308
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1072 mg/kg

$95\%$ Confidence Limits (725-1585)

Mouse 14-Day LD$_{50}$ = 1231 mg/kg

$95\%$ Confidence Limits (894-1695)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** P-NITROTOluENE  
**CODE:** 235

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-310
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 2144 mg/kg
95% Confidence Limits (1449-3171)

Mouse 14-Day LD$_{50}$ = 1231 mg/kg
95% Confidence Limits (894-1695)

Data fall in the "Toxic" category.
### Toxicity Data Sheet

**Compound:** PENTACHLOROETHANE  
**Code:** 236

**Classification:** Toxic

#### Inhalation Toxicity

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#### Oral Toxicity

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#### Other Routes of Administration

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* Concentration in mg/M³. Parenthetical value is PPM.  
** System for expression of toxicity  
***Dose in mg/Kg
Acute oral toxicity data fall within the "Toxic" classification.

REFERENCES:

236.1 Lazarew, N. W., Arch. Exp. Path. and Pharmakol., 141:19, 1929.
236.2 Barsoum, G. S. and K. Saad, Quart. J. Pharm. and Pharmacol., 7:205, 1
TOXICITY DATA SHEET

COMPOUND: 2,3-XYLIDINE  
CODE: 238

CLASSIFICATION: TOXIC

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day $LD_{50} = 933 \text{ mg/kg}$
$95\%$ Confidence Limits (631-1380)

Mouse 14-Day $LD_{50} = 1072 \text{ mg/kg}$
$95\%$ Confidence Limits (725-1586)

Data fall in the "Toxic" category.
## Toxicity Data Sheet

**Compound:** 2,4-Xyldine  
**Code:** 239  

**Classification:** Toxic

### Inhalation Toxicity

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### Oral Toxicity

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### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg

A-316
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 467 mg/kg
95% Confidence Limits (315-690)

Mouse 14-Day LD$_{50}$ = 250 mg/kg
95% Confidence Limits (147-424)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPUND:** 2,5-XYLIDINE  
**CODE:** 240

**CLASSIFICATION:** TOXIC

## INHALATION TOXICITY

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## ORAL TOXICITY

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## OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-318
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1297 mg/kg
95% Confidence Limits (937-2135)

Mouse 14-Day LD$_{50}$ = 841 mg/kg
95% Confidence Limits (474-1493)

Data fall in the "Toxic" category.
### Toxicity Data Sheet

**Compound:** 2,6-XYLIDINE  
**Code:** 241

**Classification:** TOXIC

#### Inhalation Toxicity

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#### Oral Toxicity

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#### Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
*** Dose in mg/Kg
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD₅₀ = 1231 mg/kg
95% Confidence Limits (894-1695)

Mouse 14-Day LD₅₀ = 707 mg/kg
95% Confidence Limits (522-957)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOND: 3,4-XYLIDINE

CODE: 242

CLASSIFICATION: TOXIC

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INHALATION TOXICITY

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ORAL TOXICITY

OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M³
** System for expression of toxicity
*** Dose in mg/Kg

A-322
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD\(_{50}\) = 812 mg/kg  
95% Confidence Limits (590-1118)

Mouse 14-Day LD\(_{50}\) = 707 mg/kg  
95% Confidence Limits (522-957)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOUND: 3,5-XYLIDINE

CLASSIFICATION: TOXIC

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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M<sup>3</sup>
** System for expression of toxicity
***Dose in mg/Kg
JUSTIFICATION:
Data generated under contract between the Department of Transportation and
United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 707 mg/kg
95% Confidence Limits (469-1068)

Mouse 14-Day LD$_{50}$ = 421 mg/kg
95% Confidence Limits (279-635)

Data fall in the "Toxic" category.
### TOXICITY DATA SHEET

**COMPOND:** 1-Chloronaphthalene  
**CODE:** 244

**CLASSIFICATION:** Toxic

#### INHALATION TOXiCITY

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#### ORAL TOXiCITY

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#### OTHER ROUTES OF ADMINISTRATION

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- Concentration in mg/M³  
- ** System for expression of toxicity  
- ***Dose in mg/Kg

A-326
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD₅₀ = 1540 mg/kg
95% Confidence Limits (1306-1717)

Mouse 14-Day LD₅₀ = 1091 mg/kg
95% Confidence Limits (964-1178)

Data fall in the "Toxic" category.
# TOXICITY DATA SHEET

**COMPOUND:** 2-ChlORONAPHTHALENE  
**CODE:** 245

**CLASSIFICATION:** TOXIC

## Inhalation Toxicity

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## Oral Toxicity

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## Other Routes of Administration

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* Concentration in mg/M³  
** System for expression of toxicity  
***Dose in mg/Kg

A-328
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 2078 mg/kg
95% Confidence Limits (1611-2673)

Mouse 14-Day LD$_{50}$ = 886 mg/kg
95% Confidence Limits (734-1070)

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** CRESOLS (Mixed ortho, meta and para forms) **CODE:** 246

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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### ORAL TOXICITY

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### OTHER ROUTES OF ADMINISTRATION

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</table>

- Concentration in mg/M³
- System for expression of toxicity
- Dose in mg/Kg
JUSTIFICATION:
Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1454 mg/kg
95% Confidence Limits (563-3550)

Mouse 14-Day LD$_{50}$ = 561 mg/kg
95% Confidence Limits (465-677)

Data fall in the "Toxic" category.
TOXICITY DATA SHEET

COMPOUND: 2,4-DICHLOROPHENOL

CLASSIFICATION: TOXIC

INHALATION TOXICITY

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ORAL TOXICITY

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OTHER ROUTES OF ADMINISTRATION

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</table>

* Concentration in mg/M$^3$
** System for expression of toxicity
*** Dose in mg/Kg

A-332
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

\[
\text{Rat 14-Day } LD_{50} = 2830 \text{ mg/kg} \\
95\% \text{ Confidence Limits (2054-3885)}
\]

\[
\text{Mouse 14-Day } LD_{50} = 1625 \text{ mg/kg} \\
95\% \text{ Confidence Limits (1007-2619)}
\]

Data fall in the "Toxic" category.
## Toxicity Data Sheet

**Compound:** Diethyl Sulfate  
**Code:** 248

**Classification:** Toxic

### Inhalation Toxicity

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<th>Species</th>
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<th>Sys.</th>
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### Oral Toxicity

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<td>1412</td>
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<tr>
<td>Mouse</td>
<td>647</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
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### Other Routes of Administration

<table>
<thead>
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<th>Species</th>
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<th>Sys.</th>
<th>Ref.</th>
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</table>

- Concentration in mg/M<sup>3</sup>
- **System for expression of toxicity**
- ***Dose in mg/Kg**

A-334
JUSTIFICATION:
Data generated under contract between the Department of Transportation and United States Air Force Toxic Hazards Laboratory.

Rat 14-Day LD$_{50}$ = 1412 mg/kg
95% Confidence Limits (1102-1552)

Mouse 14-Day LD$_{50}$ = 647 mg/kg
95% Confidence Limits (507-827)

Data fall in the "Toxic" category.
# Toxicity Data Sheet

**Compound:** Toluene Diisocyanate (TDI)  
**Code:** 249

**Classification:** Extremely Toxic

## Inhalation Toxicity

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<tbody>
<tr>
<td>Man (6hr)</td>
<td>600 (4265)</td>
<td>Lethal</td>
<td>249,1</td>
</tr>
<tr>
<td>Rat (4hr)</td>
<td>14 (100)</td>
<td>LC50</td>
<td>249,2</td>
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<tr>
<td>Mouse</td>
<td>10 (71)</td>
<td>LC50</td>
<td>249,2</td>
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<tr>
<td>G. P. (4hr)</td>
<td>13 (92)</td>
<td>LC50</td>
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<tr>
<td>Rabbit (4hr)</td>
<td>11 (78)</td>
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## Oral Toxicity

<table>
<thead>
<tr>
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<th>Ref.</th>
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## Other Routes of Administration

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</tbody>
</table>

* Concentration in PPM. Parenthetical value is Mg/M³.
** System for expression of toxicity.
*** Dose in mg/Kg.
Toluene diisocyanate is classified as "Extremely Toxic" because the one hour L value for most species will fall below 50 ppm.

REFERENCES:


TOXICITY DATA SHEET

COMPOUND: AMMONIA, Anhydrous Gas

CLASSIFICATION:

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<tr>
<td>Rat (1hr)</td>
<td>5100(7338)</td>
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<td>3360(4837)</td>
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OTHER ROUTES OF ADMINISTRATION

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* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
*** Dose in mg/Kg

A-338
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1 Hour LC50 = 5100 mg/m³
95% Confidence Limits (4770-5550)

or 7338 ppm
6822-785

Mouse 1 Hour LC50 = 3360 mg/m³
95% Confidence Limits (3085-3715)

or 4837 ppm
4409-530

Data fall in the "Toxic" category.
**TOXICITY DATA SHEET**

**COMPOUND:** ETHYL BROMIDE  
**CODE:** 251

**CLASSIFICATION:** TOXIC

### INHALATION TOXICITY

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</table>

* Concentration in mg/M³. Parenthetical value is PPM.
** System for expression of toxicity
***Dose in mg/Kg

A-340
JUSTIFICATION:

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1 Hour LC$_{50}$ = 120,330 mg/m$^3$

95% Confidence Limits (113,060-128,800)  or  26,980 ppm

25,350-28,710 ppm

Mouse 1 Hour LC$_{50}$ = 72,385 mg/m$^3$

95% Confidence Limits (68,505-75,045)  or  16,230 ppm

15,360-18,620 ppm

Data fall in the "Toxic" category.
APPENDIX B
A MODIFIED SYSTEM FOR CLASSIFICATION
The following classification system is proposed for consideration as an alternative to that shown on page 2:

<table>
<thead>
<tr>
<th></th>
<th>Extremely Toxic</th>
<th>Highly Toxic</th>
<th>Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, 1-Hour</td>
<td>500 mg/M$^3$ or less</td>
<td>&gt;500-2,000 mg/M$^3$</td>
<td>&gt;2,000-200,000 mg/M$^3$</td>
</tr>
<tr>
<td>LC$_{50}$</td>
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</tr>
<tr>
<td>Oral, 14-Day Single</td>
<td>5 mg/Kg or less</td>
<td>&gt;5-50 mg/Kg</td>
<td>&gt;50-5000 mg/Kg</td>
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<tr>
<td>Dose LD$_{50}$</td>
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<tr>
<td>Skin Absorption</td>
<td>20 mg/Kg or less</td>
<td>&gt;20-200 mg/Kg</td>
<td>&gt;200-20,000 mg/Kg</td>
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<tr>
<td>(Dermal) LD$_{50}$</td>
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</tbody>
</table>

It differs from the system described on page 7 in that it uses mg/M$^3$ values instead of ppm for inhalation toxicity of gases and vapors, as well as dusts and mists. Oral and skin absorption criteria are the same. This modified system would result in a change in classification for several materials, as can be seen from a comparison in Table B-1. As was mentioned in the Introduction, the following formula was used to interconvert values:

\[
\text{PPM} = \frac{24.5x \text{mg/M}^3}{\text{mol. wt.}}
\]

where ppm = parts per million by volume
mg/M$^3$ = milligrams per cubic meter
mol. wt. = molecular weight of the gas or vapor.

Data are found in Tables III and IV and in Appendix A.
### TABLE B-1
COMPOUNDS WHOSE CLASSIFICATION WOULD CHANGE UNDER THE ALTERNATIVE CRITERIA

<table>
<thead>
<tr>
<th>CODE</th>
<th>NAME</th>
<th>PPM CRITERIA</th>
<th>Mg/M³ CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>039</td>
<td>Cyanogen Gas (CN)₂</td>
<td>Toxic</td>
<td>Highly Toxic</td>
</tr>
<tr>
<td>095</td>
<td>Nitric Oxide</td>
<td>Highly Toxic</td>
<td>Highly Toxic</td>
</tr>
<tr>
<td>099</td>
<td>Nitrogen Dioxide (Nitrogen Peroxide)</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>100</td>
<td>Nitrogen Peroxide (Nitrogen Dioxide)</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>101</td>
<td>Nitrogen Tetroxide</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>102</td>
<td>Nitrogen Tetroxide-Nitric Oxide Mixtures</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>containing up to 32.2 percent weight nitric oxide</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>152</td>
<td>Chlorine</td>
<td>Toxic</td>
<td>Highly Toxic</td>
</tr>
<tr>
<td>153</td>
<td>Chlorine Trifluoride</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>161</td>
<td>Diborane</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>169</td>
<td>Fluorine</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>171</td>
<td>Hydrazine, anhydrous</td>
<td>Toxic</td>
<td>Highly Toxic</td>
</tr>
<tr>
<td>172</td>
<td>Hydrofluoric Acid Solution (Fluoric Acid, Hydrogen Fluoride Solution)</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>174</td>
<td>Hydrogen Fluoride, anhydrous</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>175</td>
<td>Hydrogen Sulfide</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>183</td>
<td>Nitric Acid, Red Fuming</td>
<td>Highly Toxic</td>
<td>Extremely Toxic</td>
</tr>
<tr>
<td>184</td>
<td>Nitric Oxide and Nitrogen Tetroxide Mixtures</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

1/ Perhaps some others would change strictly on the basis numerical values, if applicable. The contractor's professional judgment was not challenged in cases where the recommendation was based on data not strictly coming within the specified Department of Transportation criteria.