

**EXTREMELY
HAZARDOUS
SUBSTANCES**

Superfund Chemical Profiles

U.S. Environmental Protection Agency

**Volume 1
A-L**

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U.S. Environmental Protection Agency

**Volume 1
A-L**

NOYES DATA CORPORATION
Park Ridge, New Jersey, U.S.A.

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NOYES DATA CORPORATION

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Foreword

This comprehensive reference guide contains chemical profiles for each of the 366 chemicals listed as "extremely hazardous substances" by the USEPA in 1988. The EPA developed this set of documents for use in dealing with Section 302 of Title III of the Superfund Amendments and Reauthorization Act (SARA). Each profile contains a summary of documented information, which has been reviewed by the EPA for accuracy and completeness.

The profile for each hazardous substance includes chemical identity information and nine sections detailing:

- I Regulatory Information
- II Physical/Chemical Characteristics
- III Health Hazard Data
- IV Fire and Explosion Hazard Data
- V Reactivity Data
- VI Use Information
- VII Precautions for Safe Handling and Use
- VIII Protective Equipment for Emergency Situations
- IX Emergency Treatment Information

In addition, many of the profiles include an Emergency First Aid Treatment Guide (EFATG), containing expanded and more detailed guidance for emergency treatment based on information obtained from the proprietary database of the Rocky Mountain Poison Center. The emergency treatment information is geared to use by first responders; thus references to signs and symptoms of exposure, as well as procedural guidance, avoid the use of highly technical medical language.

A discussion of Personal Protective Equipment, a List of Abbreviations, and a Glossary of medical terminology are included in the introductory material.

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EPA Chemical Profiles: Introductory Information

BACKGROUND

The U.S. Environmental Protection Agency has developed a set of chemical profile reference documents for use in dealing with Section 302 of Title III of the Superfund Amendments and Reauthorization Act (SARA). These EPA profiles contain a summary of publicly available documented information for chemicals on the EPA list of extremely hazardous substances listed in the Federal Register, Vol. 52, No. 77, April 22, 1987.

The profiles were originally developed in 1985 for the 402 chemicals then called "acutely toxic chemicals" under the Chemical Emergency Preparedness Program. When the list went into law as the list of extremely hazardous substances, four additional chemicals were included. Forty of the 406 chemicals were subsequently deleted from the list. Profiles are provided for the 366 chemicals listed in February, 1988, as extremely hazardous substances. Other chemicals may be added or deleted in the future. The profile format was revised and the data were reviewed, augmented, and revised as appropriate in 1987. The profiles have been reviewed for accuracy and completeness. However, an exhaustive literature search was not performed for each chemical, and a review of original citations has not been made.

A profile is provided for each chemical on the list of extremely hazardous substances. Profiles are presented alphabetically. The Chemical Abstract Service (CAS) number of each chemical is also included. One chemical (generic name: organorhodium complex) is identified by a premanufacture review notice (PMN) number only.

The CAS number was used to search the automated Toxicology Data Base (TDB) or Hazardous Substance Data Bank (HSDB) from the National Library of Medicine (NLM). If available, TDB/HSDB files were retrieved. Approximately 65 percent of the chemicals were listed in the TDB/HSDB files. For these chemicals, the TDB/HSDB files provided the main source of information for the profiles. All data obtained from the TDB/HSDB were indicated by an asterisk (*) followed by a reference to the TDB/HSDB citation, (e.g., (*Merck 1976)). For those chemicals without a TDB/HSDB file, a limited number of standard reference materials was searched. Such references are cited by author, year, and page number. A master list of references, including the secondary references cited in TDB/HSDB, has been prepared and may be found in the Reference Section of this document. The abbreviations used in the profiles have been defined in a master list and may be found in the Abbreviation Section. Medical terms not commonly used have been included in a Glossary Section. Dorland's Medical Dictionary (1974) was used to provide most of the definitions in the Glossary.

If information was not available for a specific compound but the chemical could be categorized, then general information about the chemical category was included. Such information is indicated, for example, by the notation "Non-Specific -- Organophosphorus Pesticide" or "Non-Specific -- Poisonous Solid, n.o.s.".

DISCUSSION OF SECTIONS OF PROFILES

Each profile includes chemical identity information and eight sections containing information on regulations, properties, hazards, uses, and precautions. Comments on the elements of the profiles are presented below.

Chemical Identity. The name given on the profile is the name used on the list of extremely hazardous substances (Section 302 of SARA Title III) and is one of the most common names.

CAS Registry Number. The number is identical to the number listed in the National Institute of Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS).

Synonyms. Synonyms from TDB/HSDB files are listed without citation. Synonyms from NIOSH/RTECS (1983) or the Structure and Nomenclature Search System (SANSS) (1983), or other sources are referenced. The 9th Collective Index (CI) name from the SANSS 1983 database was added to each profile when the 9th CI name was different from the 8th CI name.

Chemical Formula and Molecular Weight. Data from TDB/HSDB or NIOSH/RTECS (1983) are not cited. Formulas or molecular weights found in other sources are cited.

Section I -- Regulatory Information. The toxicity value that placed the chemicals on the list has been included in this section. These toxicity data were obtained from a screen of the NIOSH/RTECS on-line computer file and are also cited with an asterisk (*) (e.g., *NIOSH/RTECS 1985). Toxicity data were not included for chemicals listed on the basis of high production volume and known toxicity ("Other" chemicals).

Also included are Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs), as listed in the Final Rule (Federal Register, Volume 52, Number 77, April 22, 1987).

An indication of whether the chemical is listed under Section 313 of Title III of SARA is included; if the chemical falls into a chemical category listed in Section 313, the category is given.

Section II -- Physical/Chemical Characteristics. Physical state (solid, liquid, or gas) at ambient conditions is listed, as given in the Interim Final Rule (Federal Register, Vol. 51, No. 221, November 17, 1986); no reference is cited on the profiles. Other properties are included with references.

Section III -- Health Hazard Data. Generally, only human data are reported in the Health Hazard Data section. The following exposure limits are included, if available:

Occupational Safety and Health Administration (OSHA)
Permissible Exposure Limits (PELs)

American Council of Governmental Industrial Hygienists (ACGIH)
Threshold Limit Values (TLVs); and

- Immediately Dangerous to Life and Health (IDLH) levels developed by NIOSH.

The following limits may be listed under Other Limits Recommended, if available:

- NIOSH recommendations;
- EEGLs (emergency exposure guidance levels);
- SPEGLs (short-term public emergency guidance levels);
- Human carcinogens or suspect carcinogens listed by the ACGIH;
- OSHA carcinogens; and
- NIOSH potential occupational carcinogens.

EEGLs and SPEGLs, developed by the National Research Council of the National Academy of Sciences, are discussed in more detail in Appendix D of the Technical Guidance for Hazards Analysis (EPA 1987). An EEGL is defined as an acceptable concentration for unpredicted, single, short-term emergency exposure of a defined occupational group (EEGLs have been developed for military personnel). A SPEGL is defined as an acceptable concentration for unpredicted, single, short-term, exposure of the general public in emergencies.

Information on the route of exposure and health hazards often was not available or only partially available for specific chemicals. Health hazard data often were not found specific to dose, route of entry or exposure type (acute, delayed, or chronic). Generic information on the chemical category was provided, wherever possible, in the absence of information on the specific chemical.

Section IV -- Fire and Explosion Hazard Data. In the absence of chemical-specific information, generic information is provided whenever the chemical could be categorized. National Fire Protection Association (NFPA) flammability ratings from the NFPA Fire Protection Guide on Hazardous Materials are included if available.

Section V -- Reactivity Data. In the absence of chemical-specific information, generic information is provided whenever the chemical could be categorized.

Section VI -- Use Information. This section includes uses of the chemical as reported in HSDB or other sources.

Section VII -- Precautions for Safe Handling and Use. Chemical-specific information often was not available; therefore, generic information for the chemical category often is presented.

Section VIII -- Protective Equipment for Emergency Situations. This section contains recommendations for the type of personal protective equipment to be used. See page 5 for a detailed discussion of personal protective equipment.

Section IX -- Emergency Treatment Information. This section contains information on signs and symptoms of poisoning and emergency treatment information for first responders. Emergency planners may be especially

interested in references to medical equipment and supplies that could be useful in case of the accidental release of the extremely hazardous substance.

Approximately 120 of the revised chemical profiles contain complete revisions of the emergency treatment information section and have been retitled the Emergency First Aid Treatment Guide (EFATG). This new section has been reformatted and contains more detailed guidance for emergency treatment based on information obtained from the Rocky Mountain Poison Center's proprietary data base, Poisindex. The order of completion of EFATG's is being carried out by priority based on considerations of toxicity production volume, and availability of specific emergency treatment information. Revisions of the emergency treatment information sections for the remaining profiles is underway and will be published as soon as they are completed. In the meantime, these profiles contain the emergency treatment information that was originally published in 1986.

Because the emergency treatment information is designed for use by first responders, references to signs and symptoms of exposure as well as procedural guidance avoid the use of highly technical medical language. Signs and symptoms are not distinguished by route of exposure. Emergency treatment procedures, on the other hand, are presented according to route of exposure, with emphasis on the inhalation and dermal routes. References to invasive treatments are limited, since the emergency treatment information is directed to first responders rather than medical practitioners. First responders must be aware of particular state and local regulations which govern the extent of invasive treatment that they may perform.

The Agency for Toxic substances and Disease Registry (ATSDR) has provided general review of the EFATG's for format and content.

Comments. This section is provided, in some cases, to list the sources that were checked for information in cases of chemicals for which few data were available. In general, this section pertains to chemicals without TDB/HSDB files.

Not Found. This statement on the profile can mean that:

- The value or information was not found in the references used;
- The value or information probably does not exist for this chemical; or
- The value is meaningless or not applicable for this chemical.