Chemical Properties and Hazardous Chemicals

Information Resources

Introduction

Often, confusion results from the inconsistent use of the terms hazard, hazardous material, poison, and toxic substance. A hazard is any physical, chemical, or biological agent that has the capacity to cause physical damage (e.g., heat, ultraviolet radiation, mercury) or harm the health of living organisms. A hazardous material is any chemical substance or agent (e.g., arsenic or a microorganism, respectively) that poses a potential health hazard. Toxic substances are thus a subset of hazardous materials. Those chemical substances or agents (hazardous materials) that have the potential to harm the health of living organisms are called toxic substances.

Elements, Atoms, and Compounds

All matter, whether a solid, liquid, or gas, is made up of elements. Thus far we have identified approximately 115 different elements. Many of these are familiar to us (e.g., aluminum, iron, lead, sulfur, carbon, silicon), whereas many others may not be (e.g., rhenium, thulium, terbium). An atom is the smallest unit of an element that retains the properties
of that element. When an atom of one element chemically combines with atoms of the same element, a molecule is formed. When the atoms of different elements combine during a chemical reaction, a compound is formed. Our bodies are made up of elements that form inorganic and organic compounds. Of the greater than 90 naturally occurring elements, approximately 99% of our body weight is made up of compounds containing the elements carbon, hydrogen, nitrogen, oxygen, calcium, phosphorus, and sulfur. Simple inorganic compounds such as water and sodium chloride contribute to the larger portion of the mass of our bodies when compared with organic compounds, which are of much greater molecular weight than inorganic compounds. We are all familiar with many of the important compounds that make up the body (Figure 2-1). In turn, these compounds are composed of elements specifically bonded to produce them (Table 2-1).
There are also millions of chemical compounds that have no physiological role in the body. There are greater than 6 million different chemical compounds that are known, with about 80,000 that are in common industrial and household use. Many thousands of new organic chemicals are synthesized yearly. With just carbon, nitrogen, hydrogen, oxygen, and sulfur, for example, numerous compounds can be formed, including some aromatic (=ring form) ones of toxicological importance (Figure 2-2).

### Mixtures, Suspensions, and Aerosols

The term mixture refers to any substance that contains more than one chemical compound or element that has retained its individual properties. A mixture of alcohols, for example, may contain ethanol, isopropanol, and butanol all “mixed” together, giving the appearance of a single substance. Each of the three components of this mixture is a pure substance, and each can be individually recovered from the mixture using appropriate methods. The term suspension refers to a mixture of liquid and small solid substances, whereas an aerosol (mist) is a mixture of tiny droplets of a liquid or tiny particles of a solid in a gas.

### Identifying Chemicals

Chemicals have common names, trade names, technical names, and chemical formulas associated with them, which can often be confusing. Manufacturers frequently choose commercial names for their products. This is done for obvious marketing purposes because it is easier to remember a product by a simple trade name than a complex chemical name. The chemical formula uses the appropriate abbreviations for the elements that are contained in the molecules of the chemical in question, for example, sodium = Na, hydrogen = H, carbon = C, and

<table>
<thead>
<tr>
<th>Atomic Number</th>
<th>Symbol</th>
<th>Name</th>
<th>Mass</th>
<th>Number of Covalent Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H</td>
<td>Hydrogen</td>
<td>1.008</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>Carbon</td>
<td>12.011</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>N</td>
<td>Nitrogen</td>
<td>14.007</td>
<td>3, (4)(^a)</td>
</tr>
<tr>
<td>8</td>
<td>O</td>
<td>Oxygen</td>
<td>15.999</td>
<td>2, (1)(^b)</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>Fluorine</td>
<td>18.998</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>P</td>
<td>Phosphorus</td>
<td>30.974</td>
<td>3, 5</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>Sulfur</td>
<td>32.060</td>
<td>2, 4, 6, (1)(^a)</td>
</tr>
<tr>
<td>17</td>
<td>Cl</td>
<td>Chlorine</td>
<td>35.453</td>
<td>1</td>
</tr>
<tr>
<td>53</td>
<td>I</td>
<td>Iodine</td>
<td>126.905</td>
<td>1</td>
</tr>
</tbody>
</table>

\(^a\) Number in parentheses indicates positively charged atom  
\(^b\) Number in parentheses indicates negatively charged atom
FIGURE 2-2 Examples of aromatic structures of toxicological importance.

oxygen = O. What I refer to as bicarbonate of soda may be called sodium bicarbonate by another person or sodium hydrogen carbonate by a third. We are all referring, however, to a substance that contains these four elements that are chemically combined into a compound containing the chemical formula NaHCO₃. In this example, one atom each of sodium, hydrogen, and carbon and three atoms of oxygen combine to produce the compound. The chemical formula,
however, may not be enough to indicate what the actual chemical is because several chemicals may share the same formula. Although the chemical formula tells us how many atoms of each element are contained within a compound, it does not specify the arrangement of these atoms. Different arrangements of the same types and numbers of atoms result in different compounds. Each compound, as we will see in the following section, is identified by a different Chemical Abstracts Service (CAS) registry number. For example, C₆H₈O₃ is a formula that is shared by several different chemicals, as shown in Figure 2-3.

The chemical structure is therefore important because it shows the arrangement of atoms within a compound, allowing us to identify the compound. The chemical structure is vitally important because it can provide important clues about the potential health effects from exposure to that chemical. Organic chemicals contain functional groups that can often indicate the type of toxicity one could predict from their exposure. Examples of common functional groups in toxicants are shown in Table 2-2.

- **2,3-Dihydro-4-hydroxy-2,5-dimethyl-3-furanone**
  (CAS Registry Number: 3658-77-3)

- **2-Propenoic acid, oxiranylmethyl ester**
  (CAS Registry Number: 106-90-1)

- **3-Methylglutaric anhydride**
  (CAS Registry Number: 4166-53-4)

- **7-Oxy-6, 8-dioxabicyclo-(3,2,1) - octane**
  (CAS Registry Number: 5257-20-5)

**FIGURE 2-3** Variations of the formula C₆H₈O₃.
<table>
<thead>
<tr>
<th>Functional Group</th>
<th>General Formula</th>
<th>Suffix/Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyl</td>
<td>R–OH</td>
<td>-ol (e.g., methanol, ethanol, propanol)</td>
</tr>
<tr>
<td></td>
<td>Carbon–oxygen bond</td>
<td></td>
</tr>
<tr>
<td>Methyl</td>
<td>R–CH₃</td>
<td>-ane Methane (CH₄) Ethane (C₂H₆) Propane (C₃H₈) Butane (C₄H₁₀)</td>
</tr>
<tr>
<td></td>
<td>Carbon–carbon single bond</td>
<td></td>
</tr>
<tr>
<td>Alkene</td>
<td>R–CH=CH–R'</td>
<td>-ene Ethene (C₂H₆) Propene (C₃H₈)</td>
</tr>
<tr>
<td>Alkyne</td>
<td>R–C≡C–R'</td>
<td>-yne Ethyne (C₂H₂) Propyne (C₃H₄) Butyne (C₄H₆)</td>
</tr>
<tr>
<td>Amide</td>
<td>R–C(=O)N(–H)–R'</td>
<td>Ethanamide (CH₃CONH₂)</td>
</tr>
<tr>
<td>Primary amine</td>
<td>R–NH₂</td>
<td>-amine Ethylamine (C₂H₅NH₂)</td>
</tr>
<tr>
<td>Secondary amine</td>
<td>R–N(–H)–R'</td>
<td>-amine Dimethylamine (C₃H₇NH) Diethylamine (C₄H₁₀NH)</td>
</tr>
<tr>
<td>Tertiary amine</td>
<td>R–N(–R')–R</td>
<td>-amine Trimethylamine (CH₃)₃N</td>
</tr>
<tr>
<td>Azo</td>
<td>R–N=N–R'</td>
<td>Diazoaacetamide Azobenzene</td>
</tr>
<tr>
<td>Nitrile</td>
<td>R–C≡N</td>
<td>Ethananitrite (C₂H₃CN)</td>
</tr>
<tr>
<td>Pyridyl</td>
<td>R–C₅H₄N</td>
<td>3-Pyridyl bromide</td>
</tr>
<tr>
<td>Carboxyl</td>
<td>R–C(=O)OH</td>
<td>-oic acid Acetic acid (CH₃COOH)</td>
</tr>
<tr>
<td></td>
<td>Non-ionized</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R–C(=O)O⁻</td>
<td></td>
</tr>
<tr>
<td>Aldehyde</td>
<td>R–C(=O)H</td>
<td>-al (ethanal: CH₃CHO)</td>
</tr>
<tr>
<td>Ketone</td>
<td>R–C(=O)–R'</td>
<td>-one Propanone (CH₃COCH₃)</td>
</tr>
<tr>
<td>Primary imine</td>
<td>R–C(=NH)–R'</td>
<td>-imine N-methylimine</td>
</tr>
<tr>
<td>Secondary imine</td>
<td>R–C(–H)=N–R'</td>
<td>-imine</td>
</tr>
<tr>
<td>Ether</td>
<td>R–O–R'</td>
<td>Methyl CH₃OCH₃</td>
</tr>
</tbody>
</table>
Assigning Identification

Perhaps the best way to identify a chemical is by its CAS registry number. This is similar to the way a Social Security number identifies individuals as uniquely different. The CAS number does not provide information concerning the properties of the chemical. The use of the number is important in overcoming any confusion about the identity of the chemical due to multiple common, trade, and technical names. Use of the CAS number is observed in scientific literature and product information, including material safety data sheets. Another way that chemicals can be identified is through the Registry of Toxic Effects of Chemical Substances, or RTECS, number. This registry, operated by Symyx Technologies, Inc., contains technical information about commonly used industrial chemicals. There are other systems for numbering and classifying chemicals, including the IUPAC (International Union for Pure and Applied Chemistry), EC (assigned by the European Community), and UN numbers, or UN IDs, which are four-digit numbers that identify hazardous substances and products (such as poisonous materials or explosives) of commercial importance. This numbering scheme is widely used in international commerce, for instance to label the contents of shipping containers for transportation of hazardous substances.

<table>
<thead>
<tr>
<th>Functional Group</th>
<th>General Formula</th>
<th>Suffix/Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ester</td>
<td>R–C(=O)O–R'</td>
<td>Ethyl acetate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH₃OOCCH₃</td>
</tr>
<tr>
<td>Halogen</td>
<td>F, Cl, Br, etc.</td>
<td>Chloromethane (CH₂Cl)</td>
</tr>
<tr>
<td></td>
<td>Carbon–halogen bonding</td>
<td>Iodobutane (C₄H₃I)</td>
</tr>
<tr>
<td>Isocyanate</td>
<td>R–N=C=O</td>
<td>Methyl isocyanate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH₃NCO</td>
</tr>
<tr>
<td>Isothiocyanate</td>
<td>R–N=C=S</td>
<td>Methyl isothiocyanate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NCH₃S</td>
</tr>
<tr>
<td>Phenyl</td>
<td>R–C₆H₅</td>
<td>Phenylethane (=ethylbenzene)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH₃C₆H₅</td>
</tr>
<tr>
<td>Benzyl</td>
<td>R–CH₂–C₆H₅</td>
<td>Benzylic acetate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₉H₁₀O₂</td>
</tr>
<tr>
<td>Phosphodiester</td>
<td>R–OP(=O)₂O–R'</td>
<td>Nucleic acids</td>
</tr>
<tr>
<td>Sulfhydryl</td>
<td>R–SH</td>
<td>-thiol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Methanethiol (=methyl mercaptan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH₃SH</td>
</tr>
<tr>
<td>Thioether</td>
<td>R–S–R'</td>
<td>Methylthioether (=diethyl sulfide)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH₃SCH₃</td>
</tr>
</tbody>
</table>

* R and R’ can denote any group of atoms.
Physical Properties of Chemicals

**Water Solubility**
Water solubility is defined as the maximum weight (generally in grams or milligrams) of a substance that can be completely dissolved in 1 liter of water to form a solution at a given temperature. The solubility in water may give some idea of what maximum concentrations might occur in water, whether we are referring to the body water of an organism or to an environmental body of water such as a lake.

**pH**
A pH refers to how acidic or basic (caustic) a substance is. A pH of 7 is considered neutral, whereas numbers below 7 are on the acid side of chemical neutrality and numbers above 7 are on the basic side. A pH of 1 is a very strong acid and a pH of 13 is very caustic.

**Relative Molecular Mass**
This refers to the relative weight of a molecule of a chemical compared with the relative weight of an atom of the lightest element, hydrogen.

**Octanol-to-Water Partition Coefficient**
This ratio indicates how readily any chemical dissolves in a fatty or oily medium compared with water. A very water-soluble chemical has a greater affinity for water than for octanol; thus it would have a low partition coefficient. A pesticide with the partition coefficient of 7, for example, indicates that it is much more lipophilic (fat loving) and thus accumulates in body fat, where it may be stored for a relatively long time. The octanol-to-water partition coefficient is therefore an indicator of bioaccumulation. Chemicals that have relatively high octanol-to-water partition coefficients are usually absorbed quickly through the skin and enter into the blood.

**Boiling Point, Melting Point, and Vapor Pressure**
The boiling point is the temperature at which the chemical changes from a liquid state to the gaseous state. The melting point of the chemical is the temperature at which there is a change from a solid to a liquid. The vapor pressure is the pressure at which the chemical in the liquid or solid state turns into the gaseous state even at temperatures below the boiling point. Chemicals with a high vapor pressure tend to “evaporate” more readily than others with a low vapor pressure and are therefore of more concern with respect to respiratory exposure.

**Flash Point**
The flash point is the temperature at which a substance gives off enough vapor in the air to form an ignitable mixture. The lower the flash point, the greater the risk for explosion and fire.
Autoignition Temperature and Flammability

The autoignition temperature is that temperature at which a substance spontaneously burns, that is, catches fire in the absence of a flame or a spark. A flammable material can be a solid, liquid, or gas. Something that is not flammable is not given the term inflammable. Inflammable is an older term for flammable and to avoid confusion should not be used.

Flammability (Explosive) Limits

This represents a range of concentrations for a flammable vapor or gas in air at which an explosion may occur in the presence of a flame or spark. The lower explosive limit (LEL) is a level below which there is not enough chemical present to burn (i.e., the mixture is too lean). The upper explosive limit (UEL) is a level above which there is too much chemical to burn (i.e., the mixture is too rich).

Relative Density or Specific Gravity

This is commonly defined as the weight of a specific volume of a liquid or solid chemical substance compared with the weight of the same volume of water. More correctly, specific gravity is the ratio of the density of a material to the density of water. The density of water is approximately 1 gram per cubic centimeter. Substances with a specific gravity of less than 1 are lighter than water and therefore float, whereas those that have specific gravities exceeding 1 are heavier than water and thus sink. Knowing the specific gravity is important for planning spill cleanup and fire-fighting procedures.

Relative Vapor Density

The relative vapor density refers to the weight of a specific volume of a chemical substance in the gaseous state compared with the weight of the same volume of air. From the exposure viewpoint, if the relative vapor density is less than 1, the gas collects at the ceiling level indoors or disperses into the atmosphere outdoors. On the other hand, if the gas is heavier than air (that is, it has a relative vapor density of a gas greater than 1), then the gas tends to collect at floor level indoors or in depressions outside. The possibility exists that gases having relative vapor densities greater than 1 may displace air in the breathing zone of confined spaces, thus leading to asphyxiation.

Odor Threshold

Some chemicals when present in the air can be smelled, and this can serve as a warning. The odor threshold represents the smallest concentration of the chemical in the air that can be smelled and is usually expressed in parts per million or parts per billion. Some odor thresholds are sufficiently low enough to provide adequate warning properties (e.g., sulfur dioxide), but others are not. It is important to realize that many chemicals have no smell associated with them and thus there are no warning properties associated with odor. Other important physical properties include the boiling point, vapor pressure, and melting point.
Some Web-Based Resources

A vast amount of information about chemicals and their hazardous properties can be found on the Internet. Information ranging from adverse reactions to clinical drugs to the physical chemical properties of industrial chemicals may be accessed with relative ease. Examples of these types of resources are provided here. Websites do change from time to time; however, at the time of this writing the websites provided were current.

- **Adverse Reactions to Drug Reports**: Reports that are voluntarily submitted by physicians to the U.S. Food and Drug Administration (FDA) after a drug has been approved and in use. Adverse reactions to drugs in clinical trials are subject to mandatory report. http://www.fda.gov/Safety/MedWatch/HowToReport/ucm085568.htm

- **Agency for Toxic Substances and Disease Registry (ATSDR)**: The principal federal public health agency involved with hazardous waste issues. ATSDR helps to prevent or reduce the harmful effects of exposure to hazardous substances on human health. Information about ATSDR, a database containing all information where ATSDR has worked, fact sheets on 60 of the most common contaminants at Superfund sites, and links to related sites can be found here. http://www.atsdr.cdc.gov/

- **American Association of Poison Control Centers**: Brochures on preventing poisonings in the home, emergency action cards for poisoning, poisoning fact sheets, lists of Poison Centers, and so forth. http://www.aapcc.org

- **American College of Medical Toxicology**: Professional nonprofit association of physicians with recognized expertise in medical toxicology. Their mission is to ensure that patients exposed to poisons and toxic substances receive optimal care by direct contact with qualified medical toxicologists. Their publication, *Internet Journal of Medical Toxicology*, can be accessed from this site. http://www.acmt.net


- **Centers for Disease Control and Prevention (CDC)**: The CDC is one of the 13 major operating components of the Department of Health and Human Services (HHS), which is the principal agency in the U.S. government for protecting the health and safety of all Americans. http://www.cdc.gov/
• **ChemFinder**: A chemical database that provides basic chemical data, including CAS numbers, and also provides other information, including physical property data and two-dimensional chemical structures. It is the largest single list of chemical information sites. Individual access to ChemFinder is complimentary on a limited basis. Access by corporations, academic institutions, and government organizations is granted on an enterprise subscription basis.
  http://www.cambridgesoft.com/databases/login/?serviceid=128

• **Chemical Carcinogenesis Research Information System (CCRIS)**: Carcinogenicity and mutagenicity test results for over 8,000 chemicals.

• **ClinicalTrials**: ClinicalTrials.gov provides regularly updated information about federally and privately supported clinical research in human volunteers.
  http://www.clinicaltrials.gov/

• **Developmental & Reproductive Toxicology (DART/ETIC)**: References to developmental and reproductive toxicology literature.

• **Environmental Protection Agency (EPA)**: The mission of the EPA is to protect human health and the environment.
  http://www.epa.gov/

• **Extension Toxicology Network (EXTOXNET)**: Information about pesticides and other toxicology issues from the consortium formed by the University of California, Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho.
  http://extoxnet.orst.edu/

• **Extremely Hazardous Substances (EHS)**: Chemical profiles and emergency first aid guides.
  http://www.epa.gov/emergencies/index.htm

• **Food and Drug Administration (FDA)**: The FDA is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation’s food supply, cosmetics, and products that emit radiation.
  http://www.fda.gov/

• **Genetic Toxicology (Mutagenicity) (GENE-TOX)**: Peer-reviewed genetic toxicology test data for over 3,000 chemicals.

  http://www.usfa.fema.gov/citizens/home_fire_prev/hazmat.shtm

• **Hazardous Substances Data Bank (HSDB)**: Comprehensive peer-reviewed toxicology data for about 5,000 chemicals.

• **Healthy People 2020**: Healthy People 2020 challenges individuals, communities, and professionals—indeed, all of us—to take specific steps to ensure that good health, as well as long life, are enjoyed by all.
Some Web-Based Resources

- **Integrated Risk Information System (IRIS):** Hazard identification and dose–response assessments for over 500 chemicals.

- **International Toxicity Estimates for Risk (ITER):** Risk information for over 600 chemicals from authoritative groups worldwide.

- **The Library of the Karolinska Institute of Sweden:** Collection of links to causes of poisoning, including food poisoning, bites and stings, drug toxicities, and lead poisoning.
  http://kib.ki.se/en

- **Material Safety Data Sheets (MSDS), now referred to as SDS Online**
  http://www.ilpi.com/msds/index.html

- **MEDLINEplus:** Comprehensive medical information and literature searches.
  http://www.nlm.nih.gov/medlineplus/

- **National Institute for Occupational Safety and Health (NIOSH):** NIOSH is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. NIOSH is part of the Centers for Disease Control and Prevention in the Department of Health and Human Services.
  http://www.cdc.gov/niosh/

- **National Institute of Environmental Health Sciences (NIEHS):** Focuses on basic science, disease-oriented research, global environmental health, and multidisciplinary training for researchers.
  http://www.niehs.nih.gov/

- **National Institutes of Health (NIH):** The NIH, a part of the U.S. Department of Health and Human Services, is the primary federal agency for conducting and supporting medical research.
  http://www.nih.gov/

  http://www.cdc.gov/exposurereport/

- **National Toxicology Program:** An interagency program to coordinate toxicological testing; strengthen the science base in toxicology; develop and validate improved testing methods; and provide information about potentially toxic chemicals to health regulatory and research agencies, the scientific and medical communities, and the public.
  http://ntp-server.niehs.nih.gov/

- **Occupational Safety and Health Administration (OSHA):** OSHA’s mission is to ensure the safety and health of America’s workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.
  http://www.osha.gov/
• Poisonous Plants Informational Database: Includes plant images, botany, chemistry, toxicology, diagnosis, and prevention of poisoning of animals. http://www.ansci.cornell.edu/plants/


• Right to Know Hazardous Substance Fact Sheets: New Jersey Department of Health & Senior Services, Division of Epidemiology, Environmental and Occupational Health. Available in English and Spanish. http://web.doh.state.nj.us/rtkhsfs/indexfs.aspx

• Toxicon Multimedia Project: Medical Toxicology Consortium including Cook County Hospital, The University of Illinois Hospital, and RUSH Medical Center, Chicago, Illinois. Includes Virtual Toxicology Cases and Virtual Toxicology Lectures. http://www.biologydir.com/toxikon-multimedia-project-info-7167.html


• U.S. Department of Agriculture (USDA): The USDA’s mission is to enhance the quality of life for the American people by supporting the production of agriculture. http://www.usda.gov/

• World Health Organization (WHO): The WHO’s objective, as set out in its constitution, is the attainment by all peoples of the highest possible level of health. Health is defined in the WHO’s constitution as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. http://www.who.int
Regulatory Agencies That Maintain Lists for Hazardous Chemicals

Some regulatory agencies maintain lists of environmental and industrial chemicals that are deemed to be hazardous. In addition, technical reports are available from many of these agencies. The following table is a compilation of a number of agencies that maintain such lists with contact information, and websites current at the time of this writing.

<table>
<thead>
<tr>
<th>Controlling Regulatory Entity</th>
<th>List Name</th>
<th>List Producer and Contact Information</th>
<th>Reference</th>
<th>List Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Domestic Substances List of Canada</td>
<td><a href="mailto:nsn-infoline@ec.gc.ca">nsn-infoline@ec.gc.ca</a> Notification and Client Services Division New Substances Branch Risk Assessment Directorate Environment Canada Place Vincent Massey, 14th Floor Gatineau QC K1A 0H3 Telephone: (800) 567-1999 (Toll Free in Canada) (819) 953-7156 (Outside of Canada) Facsimile: (819) 953-7155</td>
<td><a href="http://www.ec.gc.ca/substances/nsb/download/DSL_PDF">http://www.ec.gc.ca/substances/nsb/download/DSL_PDF</a></td>
<td>The final list was developed in several stages: a Core List, a Provisional List, and a Final List in 1994. Mandated by the Canadian Environmental Protection Act (CEPA), this list covers substances manufactured or imported into Canada for industrial use.</td>
</tr>
<tr>
<td>Workplace Hazardous Materials Information System (WHMIS): Ingredient Disclosure List, Canada</td>
<td>Canadian Product Safety Branch, Consumer and Corporate Affairs 50 Victoria St. Hull Quebec QC9, Canada Telephone: (819) 953-4763</td>
<td>Canadian Workplace Hazardous Material Information System. Canada Gazette Part II, 122(2) (1 Jan 1988). <a href="http://www.hc-sc.gc.ca/hecs-sesc/whmis/application.htm">http://www.hc-sc.gc.ca/hecs-sesc/whmis/application.htm</a></td>
<td>A list of chemicals that must be identified on Canadian Material Safety Data Sheets if they are included in products that fall within the Workplace Hazardous Material Information System (WHMIS) hazard criteria specified in the Controlled Products Regulations of Canada.</td>
<td>(continues)</td>
</tr>
<tr>
<td>Controlling Regulatory Entity</td>
<td>List Name</td>
<td>List Producer and Contact Information</td>
<td>Reference</td>
<td>List Description</td>
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<tr>
<td>-------------------------------</td>
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<td>-----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>World Health Organization</td>
<td>International Agency for Research on Cancer List</td>
<td>International Agency for Research on Cancer, World Health Organization, Lyon, France</td>
<td>IARC Monographs <a href="http://www.IARC.fr/">http://www.IARC.fr/</a></td>
<td>Substances that have been evaluated by the International Agency for Research on Cancer (IARC) for carcinogenic risk to humans and animals.</td>
</tr>
<tr>
<td>Controlling Regulatory Entity</td>
<td>List Name</td>
<td>List Producer and Contact Information</td>
<td>Reference</td>
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<tr>
<td>World Health Organization</td>
<td></td>
<td>For publications, call (518) 436-9686, or write to WHO Publication, Centre USA, 49 Sheden Avenue, Albany, NY 12210</td>
<td></td>
<td>These evaluations are recognized as authoritative sources of information on the carcinogenicity of chemicals.</td>
</tr>
<tr>
<td>International Maritime Association</td>
<td>Marine Pollutants List</td>
<td>International Maritime Organization, 4 Albert Embankment, London SE1 7SR, United Kingdom Telephone: +44 (0)20 7735 7611 Facsimile: +44 (0)20 7587 3210 National Response Center, RM 2611, 2100 Second Street SW, Washington, DC 20593</td>
<td>CFR 49,172.101, App. B, 1995; <a href="http://www.myregs.com/dotspa/">http://www.myregs.com/dotspa/</a></td>
<td>A list of substances, materials, and articles identified as marine pollutants or severe marine pollutants in the International Maritime Dangerous Goods (IMDG) code and of the not otherwise specified (n.o.s.) and generic entries to be used to offer marine pollutants for shipment.</td>
</tr>
<tr>
<td>U.S. Environmental Protection Agency</td>
<td>Hazardous Air Pollutants</td>
<td>EPA: (202) 272-0167 200 Pennsylvania Avenue NW, Washington, DC 20640 Clean Air Docket, EPA Library, Research Triangle Park, 109 T.W. Alexander Drive, Durham, NC 27711 Telephone: (919) 541-2777</td>
<td>Section 112 (b) (1) Hazardous Air Pollutants</td>
<td>The Clean Air Act Amendment of 990, Title 3 established this initial list of 189 hazardous pollutants.</td>
</tr>
</tbody>
</table>

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## Chapter 2: Chemical Properties and Hazardous Chemicals

<table>
<thead>
<tr>
<th>Controlling Regulatory Entity</th>
<th>List Name</th>
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</tr>
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<tbody>
<tr>
<td>EPA High Production Volume Chemical List</td>
<td>U.S. Environmental Protection Agency, P.O. Box 1473, Merrifield, VA 22116 Attention: Chemical Right-to-Know Program Telephone: (202) 564-4770</td>
<td><a href="http://www.epa.gov/opptintr/chemrtk/hpvcolst.htm">http://www.epa.gov/opptintr/chemrtk/hpvcolst.htm</a></td>
<td>Non-Confidential Information Submitted by Companies on Chemicals Under the 1990, 1994, and 1998 Inventory Update Rule (IUR).</td>
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### Controlling Regulatory Entity

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<th>List Name</th>
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<tbody>
<tr>
<td>Superfund Amendments and Reauthorization Act (SARA) of 1986, Section 110, ATSDR/EPA Priority List</td>
<td>The Agency for Toxic Substances and Disease Registry (ATSDR) in conjunction with EPA ATSDR Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333 Telephone: 1-888-42-ATSDR (1-888-422-8737) Facsimile: (770)-488-4178 Email: <a href="mailto:ATSDRIC@cdc.gov">ATSDRIC@cdc.gov</a></td>
<td><a href="http://www.atrsd.cdc.gov/clist.html">http://www.atrsd.cdc.gov/clist.html</a></td>
<td>The ATSDR Profile Priority List (APPL) ranks the 275 substances of the highest concern at National Priority List (NPL) waste sites from a public health perspective, as per SARA Section 110 and CERCLA Section 104(i)(2)(A), as amended, and likelihood of human exposure, with lowest rank (1) highest priority. Comprehensive reviews of health effect information, available from ATSDR and NTIS.</td>
</tr>
<tr>
<td>Superfund Amendments and Reauthorization Act (SARA) of 1986, Section 302, Extremely Hazardous Substances List</td>
<td>Chemical Emergency Preparedness and Prevention RCRA, Superfund, and EPCRA Call Center Telephone: (800) 424-9346 (Toll Free); (703) 412-9810 (Metropolitan DC area and international calls)</td>
<td>CFR 40,355 App. A, 1996 <a href="http://yosemite.epa.gov/oswer/ceppoehs.nsf/Alphabetical_Results?openview">http://yosemite.epa.gov/oswer/ceppoehs.nsf/Alphabetical_ Results?openview</a></td>
<td>The list of extremely hazardous substances subject to reporting requirements under Title III of SARA, when stored in amount in excess of a Threshold Planning Quantity (TPQ).</td>
</tr>
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### Controlling Regulatory Entity

**U.S. Environmental Protection Agency (continued)**

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<th>List Name</th>
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<tbody>
<tr>
<td>Toxic Chemical Release Inventory</td>
<td>U.S. Environmental Protection Agency Emergency Planning and Community Right To Know Information Hotline: (1-800) 535-0202</td>
<td><a href="http://www.epa.gov/tri/">http://www.epa.gov/tri/</a></td>
<td>A list of toxic chemicals whose emissions or releases are subject to annual reporting under Title III of SARA.</td>
</tr>
<tr>
<td>Toxic Substances Control Act Chemical Substances Inventory</td>
<td>U.S. Environmental Protection Agency, Office of Toxic Substances, Washington, DC 20460 Telephone: (202) 554-1404</td>
<td>Toxic Substances Chemical Substance Inventory. <a href="http://www.epa.gov/opptintr/newchems/inventory.htm">http://www.epa.gov/opptintr/newchems/inventory.htm</a></td>
<td>Existing commercial chemical substances in the U.S. From a regulatory perspective, substances that are not found in the Inventory are considered “new” by EPA and therefore are subject to the Premanufacture Notification requirements of TSCA. The Inventory is not intended to cover all commercial chemical substances. Certain substances such as drugs and pesticides that are regulated by other laws are explicitly excluded.</td>
</tr>
<tr>
<td>DOT Coast Guard Noxious Liquid Substances</td>
<td>Coast Guard, U.S. Department of Transportation Coast Guard Headquarters, Hazardous Materials Branch, 2100 Second Street, Washington, DC 20593-0001 Telephone: (202) 267-1577</td>
<td>CFR 46,153, Table I, 1995. CHAPTER I—COAST GUARD, DEPARTMENT OF TRANSPORTATION PART 153—SHIPS CARRYING BULK LIQUID, LIQUEFIED GAS, OR COMPRESSED GAS HAZARDOUS MATERIALS</td>
<td>Noxious liquid substances regulated by the Coast Guard.</td>
</tr>
<tr>
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<td></td>
<td>List of Substances Added to Food in the U.S.</td>
<td>U.S. FDA, Center for Food Safety and Applied Nutrition CFSAN Toll free hotline is 1-888-SAFEFOOD CFSAN, 5100 Paint Branch Parkway, College Park, MD 20740-3835</td>
<td>Priority-Based Assessment of Food Additives (PAFA) File, 1996. <a href="http://www.cfsan.fda.gov/~dms/opa-indt.html">http://www.cfsan.fda.gov/~dms/opa-indt.html</a></td>
</tr>
<tr>
<td>NTP/HHS</td>
<td>NTP Carcinogens List</td>
<td>National Toxicology Program, Public Health Service, U.S. Department of Health and Human Services NTP, P.O. Box 12233, MD EC-14, Research Triangle Park, NC 27709 Telephone: (919) 541-4096</td>
<td>Ninth Annual Report on Carcinogens, 2001, U.S. DHHS, PHS, NTP .<a href="http://ntp.niehs.nih.gov/index.cfm?objectid=72016262-BDB7-CBA-FA60E922B18C2540">http://ntp.niehs.nih.gov/index.cfm?objectid=72016262-BDB7-CBA-FA60E922B18C2540</a></td>
</tr>
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## Chapter 2: Chemical Properties and Hazardous Chemicals

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<tr>
<td>NIOSH/OSHA</td>
<td>OSHA Toxic and Hazardous Substances</td>
<td>Occupational Safety and Health Administration, DO. Technical Service Center at (202) 219-7894</td>
<td><a href="http://www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html">CFR 29,1910.1000, 1996. http://www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html</a></td>
<td>The U.S. Labor Department List of Regulated Toxic and Hazardous Substances for which occupational exposure limits are defined. Although this OSHA list was vacated by court order in 1992, it is still enforced in some states including Utah, Alaska, Michigan, New Mexico, and Vermont.</td>
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<tr>
<td>American Conference of Governmental Industrial Hygienists (ACGIH)</td>
<td>ACGIH Threshold Limit Value List</td>
<td>ACGIH, 6500 Glenway Avenue, Building D-7, Cincinnati, OH 45211-4438 Telephone: (513) 742-2020</td>
<td>Threshold Limit Values and Biological Exposure Indices for 2001</td>
<td>A list of substances for which the ACGIH recommended Threshold Limit Values (TLV), where TLV is defined as an airborne concentration to which most workers can be exposed without adverse effects.</td>
</tr>
<tr>
<td>State of Michigan DNR</td>
<td>Michigan Critical Materials Register (CMR)</td>
<td>Michigan Department of Natural Resources Great Lakes Environmental Assessment Section Surface Water Quality Division Telephone: (517)-373-2190 <a href="http://www.michigan.gov/deq">http://www.michigan.gov/deq</a></td>
<td>Michigan Department of Natural Resources, Critical Materials Register, January 1, 1994</td>
<td>Critical materials for which reporting is required under Michigan Act 293, P.A. 1972. This Act requires all businesses discharging wastewater to lagoons, deep wells, the surface of the ground, surface waters, septic tanks, or municipal sewer systems to file a report with Michigan Department of Natural Resources.</td>
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### Controlling Regulatory Entity

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<th>New Jersey Extraordinarily Hazardous Substance List</th>
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<th>State of Pennsylvania DOLI</th>
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Regional Poison Control Centers

Regional poison control centers represent important local resources for information about the toxic properties of chemicals, both clinical and nonclinical. They provide information to the public about the management of suspected poisonings by animal and plants, household products, over-the-counter and prescription drugs, pesticides, or virtually any substance available. They maintain huge databases of material safety data sheets and provide programs such as “Poisindex,” whereby any published information on a chemical can be found rapidly. Regional poison control centers and contact numbers are organized by state.

ALABAMA
Alabama Poison Center
2503 Phoenix Drive
Tuscaloosa, AL 35405
Emergency Phone: (800) 222-1222

Regional Poison Control Center
Children’s Hospital
1600 7th Avenue South
Birmingham, AL 35233
Emergency Phone: (800) 222-1222

ALASKA
Oregon Poison Center
Oregon Health Sciences University
3181 SW Sam Jackson Park Road, CB550
Portland, OR 97201
Emergency Phone: (800) 222-1222

ARIZONA
Arizona Poison and Drug Information Center
College of Pharmacy—Phoenix
650 E. Van Buren Street
Phoenix, AZ 85004
Emergency Phone: (800) 222-1222

Banner Poison Control Center
901 East Willetta Street
Room 2701
Phoenix, AZ 85006
Emergency Phone: (800) 222-1222

ARKANSAS
Arkansas Poison and Drug Information Center
College of Pharmacy
University of Arkansas for Medical Sciences
4301 West Markham Street
Little Rock, AR 72205
Emergency Phone: (800) 222-1222

CALIFORNIA
California Poison Control System
California Poison Control System—Fresno/Madera Division
Valley Children’s Hospital
9300 Valley Children’s Place, MB15
Madera, CA 93638-8762
Emergency Phone: (800) 222-1222

California Poison Control System—Sacramento Division
UC Davis Medical Center
2315 Stockton Boulevard
Sacramento, CA 95817
Emergency Phone: (800) 222-1222

California Poison Control System—San Diego Division
University of California, San Diego, Medical Center
200 West Arbor Drive
San Diego, CA 92103-8925
Emergency Phone: (800) 222-1222

California Poison Control System—San Francisco Division
San Francisco General Hospital
University of California, San Francisco
Box 1369
San Francisco, CA 94143-1369
Emergency Phone: (800) 222-1222

COLORADO
Rocky Mountain Poison and Drug Center
990 Bannock Street
Denver, CO 80204-4028
Emergency Phone: (800) 222-1222

CONNECTICUT
Connecticut Poison Control Center
University of Connecticut Health Center
263 Farmington Avenue
Farmington, CT 06030-5365
Emergency Phone: (800) 222-1222

DELWARE
The Poison Control Center
Children’s Hospital of Philadelphia
3535 Market Street, Suite 985
Philadelphia, PA 19104-4303
Emergency Phone: (800) 222-1222

DISTRICT OF COLUMBIA
National Capital Poison Center
3201 New Mexico Avenue NW
Washington, DC 20016
Emergency Phone: 1-800-222-1222

FLORIDA
Florida Poison Information Center—Jacksonville
Shands Jacksonville Medical Center
655 West 8th Street, Box C23
Jacksonville, FL 32209
Emergency Phone: (800) 222-1222

Florida Poison Information Center—Miami
University of Miami, Dept. of Pediatrics
P.O. Box 110626 (R-131)
Miami, FL 33101
Emergency Phone: (800) 222-1222

Florida Poison Information Center—Tampa
Tampa General Hospital
P.O. Box 1289
Tampa, FL 33601
Emergency Phone: (800) 222-1222

GEORGIA
Georgia Poison Center
CHOA at Hughes Spalding
Grady Health System
80 Jesse Hill Jr. Drive, SE
Atlanta, GA 30335-3801
Emergency Phone: (800) 222-1222

HAWAII
Hawaii Poison Center
1319 Punahou Street
Honolulu, HI 96826
Emergency Phone: (800) 222-1222

Rocky Mountain Poison & Drug Center
777 Bannock Street
Denver, CO 80204-4028
Emergency Phone: (800) 222-1222

IDAHO
Rocky Mountain Poison and Drug Center
777 Bannock Street
Denver, CO 80204-4028
Emergency Phone: (800) 222-1222

ILLINOIS
Illinois Poison Center
222 S. Riverside Plaza, Suite 1900
Chicago, IL 60606
Emergency Phone: (800) 222-1222

INDIANA
Indiana Poison Center
Methodist Hospital, Room AG373
Clarian Health Partners
I-65 at 21st Street
Indianapolis, IN 46206-1367
Emergency Phone: (800) 222-1222

IOWA
Iowa Statewide Poison Control Center
Iowa Health System and University of Iowa Hospitals & Clinics
401 Douglas Street, Suite 402
Sioux City, IA 51101
Emergency Phone: (800) 222-1222

KANSAS
Mid-America Poison Center
University of Kansas Medical Center
3901 Rainbow Blvd., Room B-400
Kansas City, KS 66160-7231
Emergency Phone: (800) 222-1222

KENTUCKY
Kentucky Regional Poison Center
Medical Towers South, Suite 847
234 East Gray Street
Louisville, KY 40202
Emergency Phone: (800) 222-1222

LOUISIANA
Louisiana Poison Center
LSUHSC—Shreveport, Dept. of Emergency Medicine
Section of Clinical Toxicology
1521 Wilkinson Street
Shreveport, LA 71103
Emergency Phone: (800) 222-1222

MAINE
Northern New England Poison Center
Serving Maine, New Hampshire,
and Vermont
22 Bramhall Street
Portland, ME 04102
Emergency Phone: (800) 222-1222

MARYLAND
Maryland Poison Center
222 Arch Street, #1
Baltimore, MD 21201
Emergency Phone: (800) 222-1222

National Capital Poison Center
3201 New Mexico Avenue NW
Suite 310
Washington, DC 20016
Emergency Phone: (800) 222-1222

MASSACHUSETTS
Regional Center for Poison Control and Prevention
Serving Massachusetts and Rhode Island
Children’s Hospital Boston
Smith Building
300 Longwood Avenue
Boston, MA 02115
Emergency Phone: (800) 222-1222

MICHIGAN
Children’s Hospital of Michigan
Regional Poison Control Center
4160 John R Harper Professional Office Building, Suite 616
Detroit, MI 48201
Emergency Phone: (800) 222-1222

DeVos Children’s Hospital
Regional Poison Center
100 Michigan NE, Suite 203
Grand Rapids, MI 49503
Emergency Phone: (800) 222-1222

MINNESOTA
Hennepin Regional Poison Center
Hennepin County Medical Center
701 Park Avenue
Minneapolis, MN 55415
Emergency Phone: (800) 222-1222
MISSISSIPPI
Mississippi Regional Poison Control Center
University of Mississippi Medical Center
2500 N. State Street
Jackson, MS 39216
Emergency Phone: (800) 222-1222

MISSOURI
Missouri Regional Poison Center
7980 Clayton Road
St. Louis, MO 63117
Emergency Phone: (800) 222-1222

MONTANA
Rocky Mountain Poison and Drug Center
777 Bannock Street
Mail Code 0180
Denver, CO 80204-4028
Emergency Phone: (800) 222-1222

NEBRASKA
Nebraska Regional Poison Center
8401 West Dodge Road, Suite 115
Omaha, NE 68114
Emergency Phone: (800) 222-1222

NEVADA
Oregon Poison Center
Oregon Health Sciences University
3181 SW Sam Jackson Park Road
Portland, OR 97201
Emergency Phone: (800) 222-1222

NEW HAMPSHIRE
Northern New England Poison Center
Serving Maine, New Hampshire, and Vermont
22 Bramhall Street
Portland, ME 04102
Emergency Phone: (800) 222-1222

NEW JERSEY
New Jersey Poison Information and Education System
University of Medicine and Dentistry at New Jersey
140 Bergen Street
Newark, NJ 07101
Emergency Phone: (800) 222-1222

NEW MEXICO
New Mexico Poison and Drug Information Center
MSC09 5080
1 University of New Mexico
Albuquerque, NM 87131-0001
Emergency Phone: (800) 222-1222

NEW YORK
Upstate New York Poison Center
750 East Adams Street
Syracuse, NY 13210
Emergency Phone: (800) 222-1222

Long Island Regional Poison and Drug Information Center
Winthrop University Hospital
259 First Street
Mineola, NY 11501
Emergency Phone: (800) 222-1222

New York City Poison Control Center
NYC Bureau of Public Health Labs
455 First Avenue
Room 123, Box 81
New York, NY 10016
Emergency Phone: (800) 222-1222

Western New York Poison Center
Children’s Hospital of Buffalo
219 Bryant Street
Buffalo, NY 14222
Emergency Phone: (800) 222-1222

NORTH CAROLINA
Carolinas Poison Center
Carolinias Medical Center  
P.O. Box 32861  
Charlotte, NC 28232  
Emergency Phone: (800) 222-1222

NORTH DAKOTA  
Hennepin Regional Poison Center  
Hennepin County Medical Center  
701 Park Avenue  
Minneapolis, MN 55415  
Emergency Phone: (800) 222-1222

OHIO  
Central Ohio Poison Center  
Nationwide Children’s Hospital  
700 Children’s Drive  
Columbus, OH 43205  
Emergency Phone: (800) 222-1222

Cincinnati Drug and Poison Information Center  
3333 Burnet Avenue  
Vernon Place—3rd Floor  
Cincinnati, OH 45229  
Emergency Phone: (800) 222-1222

Greater Cleveland Poison Center  
11100 Euclid Avenue  
Cleveland, OH 44106-6007  
Emergency Phone: (800) 222-1222

OKLAHOMA  
Oklahoma Poison Control Center  
Children’s Hospital at OU Medical Center  
940 NE 13th Street, Suite 3850  
Oklahoma City, OK 73104  
Emergency Phone: (800) 222-1222

OREGON  
Oregon Poison Center  
Oregon Health & Science University  
3181 SW Sam Jackson Park Road, CB550  
Portland, OR 97239  
Emergency Phone: (800) 222-1222

PENNSYLVANIA  
Pittsburgh Poison Center  
Children’s Hospital of Pittsburgh  
200 Lothrop Street  
Pittsburgh, PA 15213  
Emergency Phone: (800) 222-1222

The Poison Control Center at  
The Children’s Hospital of Philadelphia  
34th & Civic Center Blvd.  
Philadelphia, PA 19104-4303  
Emergency Phone: (800) 222-1222

PUERTO RICO  
Puerto Rico Poison Center  
Administracion de Servicios Medicos de P.R. (ASEM), Centro Medico de Puerto Rico, Barrio Monacillo Carr. #22, Paseo Dr. Jose Celso Barbosa  
Rio Piedras Pu 935  
Emergency Phone: (800) 222-1222

RHODE ISLAND  
Regional Center for Poison Control and Prevention  
Serving Massachusetts and Rhode Island  
Children’s Hospital  
300 Longwood Avenue  
Boston, MA 02115  
Emergency Phone: (800) 222-1222

SOUTH CAROLINA  
Palmetto Poison Center  
College of Pharmacy  
University of South Carolina  
Columbia, SC 29208  
Emergency Phone: (800) 222-1222

SOUTH DAKOTA  
Sanford Poison Center  
Hennepin Regional Poison Center  
Sanford Health, 1305 West 18th Street  
Sioux Falls, SD, 57117-5039  
Emergency Phone: (800) 222-1222
TENNESSEE
Tennessee Poison Center
501 Oxford House
1161 21st Avenue South
Nashville, TN 37232-4632
Emergency Phone: (800) 222-1222

TEXAS
Central Texas Poison Center
Scott and White Memorial Hospital
2401 South 31st Street
Temple, TX 76508
Emergency Phone: (800) 222-1222

North Texas Poison Center
Parkland Memorial Hospital
5201 Harry Hines Blvd.
Dallas, TX 75235
Emergency Phone: (800) 222-1222

South Texas Poison Center
The University of Texas Health Science Center—San Antonio Cancer Therapy and Research Center
7979 Wurzbach Road
San Antonio, TX 78229-3900
Emergency Phone: (800) 222-1222

Southeast Texas Poison Center
The University of Texas Medical Branch
3.112 Trauma Center
301 University Blvd.
Galveston, TX 77555-1175
Emergency Phone: (800) 222-1222

Texas Panhandle Poison Center
1501 S. Coulter
Amarillo, TX 79106
Emergency Phone: (800) 222-1222

SOUTHERN DISASTER RESEARCH CENTER
300 East Wetmore
University of Texas Medical Branch
Galveston, TX 77550-0001

UTAH
Utah Poison Control Center
585 Komas Drive, Suite 200
Salt Lake City, UT 84108-1208
Emergency Phone: (800) 222-1222

VERMONT
Northern New England Poison Center
Serving Maine, New Hampshire, and Vermont
22 Bramhall Street
Portland, ME 04102
Emergency Phone: (800) 222-1222

VIRGINIA
Blue Ridge Poison Center
University of Virginia Health System
1222 Jefferson Park Ave.
P.O. Box 800774
Charlottesville, VA 22908-0774
Emergency Phone: (800) 222-1222

National Capital Poison Center
3201 New Mexico Avenue NW, Suite 310
Washington, DC 20016
Emergency Phone: (800) 222-1222

Virginia Poison Center
Medical College of Virginia Hospitals
Virginia Commonwealth University Medical Center
600 E. Broad Street, Suite 640
P.O. Box 980522
Richmond, VA 23298-0522
Emergency Phone: (800) 222-1222

WASHINGTON
Washington Poison Center
155 NE 100th Street, Suite 400
Seattle, WA 98125-8011
Emergency Phone: (800) 222-1222

WEST VIRGINIA
West Virginia Poison Center
Additional Resources

Websites

Agency for Toxic Substances and Disease Registry (ATSDR):
http://www.atsdr.cdc.gov/

American Association of Poison Control Centers:
http://www.aapcc.org

American College of Medical Toxicology:
http://www.acmt.net

Carcinogenic Potency Project:

Centers for Disease Control and Prevention (CDC):
http://www.cdc.gov/

ChemFinder:
http://www.cambridgesoft.com/databases/login/?serviceid=128

Chemical Carcinogenesis Research Information System (CCRIS):

ClinicalTrials:
http://www.clinicaltrials.gov/

Developmental & Reproductive Toxicology (DART/ETIC):

Environmental Protection Agency (EPA):
http://www.epa.gov/

EXTOXNET:
http://extoxnet.orst.edu/

Extremely Hazardous Substances (EHS):
http://www2.epa.gov/science-and-technology/substances-and-toxics
Food and Drug Administration (FDA):
http://www.fda.gov/

Genetic Toxicology (Mutagenicity) (GENE-TOX):

Hazardous Materials:
http://www.usfa.fema.gov/citizens/home_fire_prev/hazmat.shtm

Hazardous Substances Data Bank (HSDB):

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Integrated Risk Information System (IRIS):

International Toxicity Estimates for Risk (ITER):

IUPAC:
http://www.iupac.org

The Library of the Karolinska Institute of Sweden:
http://kib.ki.se/en

MEDLINEplus:
http://www.nlm.nih.gov/medlineplus/

Medwatch Homepage:
http://www.fda.gov/Safety/MedWatch/HowToReport/ucm085568.htm

National Institute for Occupational Safety and Health (NIOSH):
http://www.cdc.gov/niosh

National Institute of Environmental Health Sciences (NIEHS):
http://www.niehs.nih.gov/

National Institutes of Health (NIH):
http://www.nih.gov/

National Institute of Standards and Technology:
http://webbook.nist.gov/chemistry/

National Report on Human Exposure to Environmental Chemicals:
http://www.cdc.gov/exposurereport/

National Toxicology Program:
http://ntp-server.niehs.nih.gov/
Occupational Safety and Health Administration (OSHA):
http://www.osha.gov/

Poisonous Plants Informational Database:
http://www.ansci.cornell.edu/plants/

Recognition and Management of Pesticide Poisonings:
http://npic.orst.edu/rmpp.htm

Registry of Toxic Effects of Chemical Substances:
http://www.cdc.gov/niosh/97-119.html

Right to Know Hazardous Substance Fact Sheets:
http://web.doh.state.nj.us/rtkhsfs/indexfs.aspx

Toxicon Multimedia Project:
http://www.biologydir.com/toxikon-multimedia-project-info-7167.html

TOXLINE:

Toxics Release Inventory (TRI):

U.S. Department of Agriculture:
http://www.usda.gov/

World Health Organization:
http://www.who.int