



PUBLIC HEALTH STATEMENT

1,1,2,2-Tetrachloroethane

CAS # 79-34-5

Division of Toxicology and Environmental Medicine

September 2008

This Public Health Statement is the summary chapter from the Toxicological Profile for 1,1,2,2-Tetrachloroethane. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-800-232-4636.

This public health statement tells you about 1,1,2,2-tetrachloroethane and the effects of exposure to it.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites are then placed on the National Priorities List (NPL) and are targeted for long-term federal clean-up activities. 1,1,2,2-Tetrachloroethane has been found in at least 329 of the 1,699 current or former NPL sites. Although the total number of NPL sites evaluated for this substance is not known, the possibility exists that the number of sites at which 1,1,2,2-tetrachloroethane is found may increase in the future as more sites are evaluated. This information is important because these sites may be sources of exposure and exposure to this substance may be harmful.

When a substance is released either from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. Such a release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to 1,1,2,2-tetrachloroethane, many factors will determine whether you will be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider any other chemicals you are exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

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1.1 WHAT IS 1,1,2,2-TETRACHLOROETHANE?

Description	<p>1,1,2,2-Tetrachloroethane is a synthetic, colorless, dense liquid that does not burn easily.</p> <p>It has a penetrating, sweet odor similar to chloroform.</p>
Uses <ul style="list-style-type: none">• Manufacturing	<p>1,1,2,2-Tetrachloroethane production has decreased significantly in the United States. In the past, it was used in large amounts to produce other chemicals and as an industrial solvent.</p> <p>1,1,2,2-Tetrachloroethane was also used to separate fats and oils from other substances, to clean and degrease metals, and in paints and pesticides. Less toxic chemicals are now available to replace this solvent, and large-scale commercial production has stopped, although some production still occurs.</p> <p>It is presently used as a chemical intermediate, and information about this use is limited.</p>

1.2 WHAT HAPPENS TO 1,1,2,2-TETRACHLOROETHANE WHEN IT ENTERS THE ENVIRONMENT?

Sources	<p>Most 1,1,2,2-tetrachloroethane released into the environment eventually moves into the air or groundwater. Most of the 1,1,2,2-tetrachloroethane released to soil or land will evaporate back to the air.</p> <p>If released on the land, 1,1,2,2-tetrachloroethane does not tend to attach to soil particles. When released to surface water, much of the chemical will evaporate back to the air, while the remainder may break down due to reactions with water. Similar reactions can take place in soils and sediments.</p>
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<p>How 1,1,2,2-tetrachloroethane breaks down</p>	<p>Most 1,1,2,2-tetrachloroethane is expected to disappear from groundwater and air in about 1 year.</p> <p>1,1,2,2-Tetrachloroethane breaks down by losing chlorine atoms. The resulting chemicals may also pose a health hazard.</p> <p>It has been estimated that 1,1,2,2-tetrachloroethane should not build up significantly in the bodies of fish or other aquatic organisms.</p>
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1.3 HOW MIGHT I BE EXPOSED TO 1,1,2,2-TETRACHLOROETHANE?

<p>General population</p>	<p>Exposure of the general population to 1,1,2,2-tetrachloroethane is expected to be very low based on the low concentrations reported for this substance in the environment.</p> <p>Individuals located near hazardous waste sites and facilities where this substance is used may be exposed to 1,1,2,2-tetrachloroethane in contaminated air, water, or soil.</p>
<p>Workplace</p>	<p>When a chemical such as 1,1,2,2-tetrachloroethane is used in making other chemicals, it is generally contained in closed automatic systems, which are not open to the air. Therefore, workers are not usually exposed to high levels of 1,1,2,2-tetrachloroethane.</p>

1.4 HOW CAN 1,1,2,2-TETRACHLOROETHANE ENTER AND LEAVE MY BODY?

<p>Enter your body</p> <ul style="list-style-type: none"> • Inhalation • Ingestion • Dermal contact 	<p>1,1,2,2-Tetrachloroethane can enter your body through the lungs.</p> <p>Most of the 1,1,2,2-tetrachloroethane in food or water will rapidly enter the body through the digestive tract.</p> <p>1,1,2,2-Tetrachloroethane can also enter your body through the skin.</p>
<p>Leave your body</p>	<p>Once in your body, 1,1,2,2-tetrachloroethane is transformed into other chemicals called metabolites. Most of these other chemicals leave the body in the breath or urine within few days.</p>

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1.5 HOW CAN 1,1,2,2-TETRACHLOROETHANE AFFECT MY HEALTH?

This section looks at studies concerning potential health effects in animal and human studies.

General population <ul style="list-style-type: none">• Inhalation	<p>Breathing concentrated fumes of 1,1,2,2-tetrachloroethane (enough so that you notice its sickeningly sweet smell) can rapidly cause drowsiness, dizziness, nausea, and vomiting. Most people recover from these effects once they are in fresh air.</p> <p>Breathing high levels of 1,1,2,2-tetrachloroethane for a long time can cause liver damage.</p>
<ul style="list-style-type: none">• Oral	<p>Drinking very large amounts of 1,1,2,2-tetrachloroethane can cause shallow breathing, faint pulse, decreased blood pressure, and possibly unconsciousness.</p>
Laboratory animals <ul style="list-style-type: none">• Oral	<p>Oral exposure to very high doses of 1,1,2,2-tetrachloroethane can result in fatigue, difficulty breathing, and unconsciousness.</p> <p>Lower dose levels can result in liver damage.</p>
Cancer	<p>An increase in liver tumors was observed in mice following oral exposure.</p> <p>The EPA determined that 1,1,2,2-tetrachloroethane is a possible human carcinogen. The International Agency for Research on Cancer (IARC) determined that 1,1,2,2-tetrachloroethane is not classifiable as to human carcinogenicity.</p>

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1.6 HOW CAN 1,1,2,2-TETRACHLOROETHANE AFFECT CHILDREN?

This section discusses potential health effects in humans from exposures during the period from conception to maturity at 18 years of age.

Effects in children	<p>There are no studies evaluating the effect of 1,1,2,2-tetrachloroethane exposure on children or immature animals. It is likely that children would have the same health effects as adults. We do not know whether children would be more sensitive than adults to the effects of 1,1,2,2-tetrachloroethane.</p> <p>It is possible that children are less strongly affected than adults because the ability of their body to convert 1,1,2,2-tetrachloroethane into more harmful products is immature.</p>
Birth defects	<p>Some effects have been observed in laboratory animals born to females exposed to 1,1,2,2-tetrachloroethane during pregnancy. This occurred at exposure levels that were also toxic to the mothers.</p>
Breast milk	<p>There is no information on levels of 1,1,2,2-tetrachloroethane in human breast milk.</p>

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO 1,1,2,2-TETRACHLOROETHANE?

Consumer products	<p>Families are not likely to be exposed to amounts of 1,1,2,2-tetrachloroethane that are high enough to be a health concern because the chemical is no longer used in household products.</p> <p>It is possible that some old household products (such as cleaners, degreasers, and paints) contain small amounts of 1,1,2,2-tetrachloroethane; these products should be kept out of reach from children and used according to manufacturer's instructions.</p>
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1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,1,2,2-TETRACHLOROETHANE?

Detecting exposure	1,1,2,2-Tetrachloroethane breakdown products (metabolites) can be measured in blood and urine; however, these metabolites are common to several types of compounds.
Measuring exposure	The detection of 1,1,2,2-tetrachloroethane and/or its metabolites in your urine cannot be used to predict the kind of health effects that might develop from that exposure.

1.9 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations *can* be enforced by law. The EPA, the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA) are some federal agencies that develop regulations for toxic substances. Recommendations provide valuable guidelines to protect public health, but *cannot* be enforced by law. The Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH) are two federal organizations that develop recommendations for toxic substances.

Regulations and recommendations can be expressed as “not-to-exceed” levels, that is, levels of a toxic substance in air, water, soil, or food that do not exceed a critical value that is usually based on levels that affect animals; they are then adjusted to levels that will help protect humans. Sometimes these not-to-exceed levels differ among federal organizations because they used different exposure times (an 8-hour workday or a 24-hour day), different animal studies, or other factors.

Recommendations and regulations are also updated periodically as more information becomes available. For the most current information, check with the federal agency or organization that provides it.

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Some regulations and recommendations for 1,1,2,2-tetrachloroethane include the following:

Drinking water	The EPA has determined that exposure to 1,1,2,2-tetrachloroethane in drinking water at a concentration of 0.04 mg/L for up to 10 days is not expected to cause any adverse effects in a child. The EPA has determined that lifetime exposure to 0.0003 mg/L 1,1,2,2-tetrachloroethane in drinking water is not expected to cause any adverse effects.
Workplace air	OSHA set a legal limit of 5 ppm 1,1,2,2-tetrachloroethane in air averaged over an 8-hour work day.

1.10 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department, or contact ATSDR at the address and phone number below.

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses that result from exposure to hazardous substances.

Toxicological profiles are also available on-line at www.atsdr.cdc.gov and on CD-ROM. You may request a copy of the ATSDR ToxProfiles™ CD-ROM by calling the toll-free information and technical assistance number at 1-800-CDC-INFO (1-800-232-4636), by e-mail at cdcinfo@cdc.gov, or by writing to:

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine
1600 Clifton Road NE
Mailstop F-32
Atlanta, GA 30333
Fax: 1-770-488-4178

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Organizations for-profit may request copies of final Toxicological Profiles from the following:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Phone: 1-800-553-6847 or 1-703-605-6000
Web site: <http://www.ntis.gov/>

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