



PUBLIC HEALTH STATEMENT

1,1,2-TRICHLOROETHANE

CAS#: 79-00-5

Division of Toxicology

December 1989

This Public Health Statement is the summary chapter from the Toxicological Profile for 1,1,2-Trichloroethane. 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 1-888-422-8737.

1.1 WHAT IS 1,1,2-TRICHLOROETHANE?

1,1,2-Trichloroethane is a colorless, sweet-smelling liquid that does not burn easily and boils at a higher temperature than water. It is made by two companies in the United States. It is used mostly where 1,1-dichloroethene (vinylidene chloride) is made. 1,1,2-Trichloroethane is used as a solvent. Because information about how much is made and how it is used is not available, we cannot say how much 1,1,2-trichloroethane is used, where it is used, or in what products it is found.

1,1,2-Trichloroethane may also be formed in landfills when 1,1,2,2-tetrachloroethane is broken down. When it is released into the environment, most 1,1,2-trichloroethane finally ends up in the air, but some may enter groundwater. Breakdown in both the air and groundwater is slow.

In the air, half the 1,1,2-trichloroethane is expected to breakdown in 49 days, and so it is likely to spread far from where it is released before breaking

down. A few studies show that 1,1,2-trichloroethane below the soil surface or in groundwater does not breakdown within 16 weeks, and other studies suggest that it will last for years. Some studies show that breakdown of 1,1,2-trichloroethane occurs in landfills, but how fast this happens is not known.

1.2 HOW MIGHT I BE EXPOSED TO 1,1,2-TRICHLOROETHANE?

Low levels of 1,1,2-trichloroethane may be found in outdoor air. The main source of this 1,1,2-trichloroethane is thought to be industries that use it as a solvent. Because the industries that produce 1,1,2-trichloroethane or use it to make other chemicals often recycle or burn their waste, releases of 1,1,2-trichloroethane by these industries should not be major sources of pollution.

From surveys of industrial wastewater, we learn that some of the industries that discharge 1,1,2-trichloroethane are the timber products industry, plastics and synthetics industry, and laundries. Limited data show that 1,1,2-trichloroethane is present in a quarter to a half of city air samples. Where 1,1,2-trichloroethane is found, the samples tested usually contain 10 to 50 parts of 1,1,2-trichloroethane per trillion parts of air (ppt).

Though exposure to contaminated drinking water taken from groundwater sources is possible, such exposure appears to be rare. A nationwide survey did not find 1,1,2-trichloroethane in drinking water, but well water in some areas has been found to contain it. Surveys found 1,1,2-trichloroethane in well water in Wisconsin, New Jersey, Rhode Island, and Suffolk County, New York. The largest amount in these supplies was 31 parts of 1,1,2-

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trichloroethane per one billion parts of water (ppb). 1,1,2-Trichloroethane has not been reported in food or soil. Besides the air and drinking water sources, people may be exposed to 1,1,2-trichloroethane from spills and in the workplace, where it may be used as a solvent. Exposure would most likely be

from breathing vapors of the chemical or from skin contact.

When a chemical like 1,1,2-trichloroethane is utilized to make other chemicals, it is usually used in tightly closed automatic systems, so that workers are not usually exposed to high levels of it. A national survey conducted in 1981-1983 estimated that 1,036 workers were exposed to 1,1,2-trichloroethane. 1,1,2-Trichloroethane has been found thus far at 45 of 1,177 hazardous waste sites on the National Priorities List (NPL) in the United States. Landfill gases from these sites may contain 1,1,2-trichloroethane.

1.3 HOW CAN 1,1,2-TRICHLOROETHANE ENTER AND LEAVE MY BODY?

1,1,2-Trichloroethane can enter the body when a person breathes air containing 1,1,2-trichloroethane, or when a person drinks water containing this compound. It can also enter the body through the skin. After it enters the body, it is carried by the blood to organs and tissues such as the liver, kidney, brain, heart, spleen, and fat.

Experiments in which animals were given 1,1,2-trichloroethane by mouth have shown that most 1,1,2-trichloroethane leaves the body unchanged in the breath and as other substances that it was

changed into in the urine in about 1 day. Very little stays in the body more than 2 days.

1.4 HOW CAN 1,1,2-TRICHLOROETHANE AFFECT MY HEALTH?

1,1,2-Trichloroethane can cause temporary stinging and burning pain on the skin when humans touch it. There is no other information on the health effects of 1,1,2-trichloroethane in humans.

Most of what we know about the health effects of this chemical comes from experiments in animals. As is true with most chemicals, a large amount of 1,1,2-trichloroethane produces more damage than a small amount. Short-term exposure to high levels of 1,1,2-trichloroethane in air or high doses given by mouth or applied to the skin has caused death in animals.

Long-term exposure of animals to high doses given by mouth has also shortened the lifespan. These levels and doses are much higher than would be found in the air, water, or food to which humans might be exposed. Breathing high levels in air can affect the nervous system and cause sleepiness. 1,1,2-Trichloroethane may also affect the liver, kidney, and digestive tract, produce skin irritation, and affect the body's ability to fight infections. Mice, but not rats, that were given high doses of 1,1,2-trichloroethane by mouth for most of their life developed liver cancer, but we do not know whether humans exposed to this chemical would develop cancer. From the limited information available in animals, it appears that 1,1,2-trichloroethane does not cause birth defects or otherwise inhibit normal development.

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1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,1,2-TRICHLOROETHANE?

Although chemists have ways of measuring some chemicals in body fluids, there is no commonly used medical test to find out whether a person has been exposed to 1,1,2-trichloroethane.

1.6 WHAT LEVELS OF EXPOSURE HAVE RESULTED IN HARMFUL HEALTH EFFECTS?

It is not known what levels of 1,1,2-trichloroethane cause harmful health effects in people. In animals, liver effects, central nervous system depression, and death occurred at levels greater than 416 parts per million (ppm) 1,1,2-trichloroethane in air. At levels of 200 ppm in water, effects on the immune system and liver were seen.

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

The EPA has set a limit of 0.005 milligrams of 1,1,2-trichloroethane per liter of drinking water (0.005 mg/L). Discharges, spills, or accidental releases of 100 pounds or more of 1,1,2-trichloroethane must be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 45 milligrams 1,1,2-trichloroethane per cubic meter of air (45 mg/m³) for an 8-hour workday in a 40-hour workweek.

1.8 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:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

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

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 1989. Toxicological profile for 1,1,2-trichloroethane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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