



PUBLIC HEALTH STATEMENT

1,2-DIBROMO-3-CHLOROPROPANE

CAS#: 96-12-8

Division of Toxicology

September 1992

This Public Health Statement is the summary chapter from the Toxicological Profile for 1,2-Dibromo-3-chloropropane. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQsTM 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.

This Statement was prepared to give you information about 1,2-dibromo-3-chloropropane and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,177 sites on its National Priorities List (NPL) sites. 1,2-Dibromo-3-chloropropane has been found at 8 of these sites. However, we do not know how many of the 1,177 NPL sites have been evaluated for 1,2-dibromo-3-chloropropane. As EPA evaluates more sites, the number of sites at which 1,2-dibromo-3-chloropropane is found may change. This information is important for you because 1,2-dibromo-3-chloropropane may cause harmful health effects and because these sites are potential or actual sources of human exposure to 1,2-dibromo-3-chloropropane.

When a chemical is released from a large area such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment as a chemical emission. This emission, which is also called a release, does not always lead to exposure. You are exposed to a chemical only when you come

into contact with that chemical. You may be exposed to it in the environment by breathing, eating, or drinking substances containing the chemical or from skin contact with it.

If you are exposed to a hazardous substance such as 1,2-dibromo-3-chloropropane, several factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, sex, nutritional status, family traits, lifestyle, and state of health.

1.1 WHAT IS 1,2-DIBROMO-3-CHLOROPROPANE?

1,2-Dibromo-3-chloropropane is a colorless liquid with a sharp smell. It can be smelled in air at 2 parts chemical in 1 million parts of air. It evaporates about as fast as water does, which is not very quickly. 1,2-Dibromo-3-chloropropane will dissolve in water to a very limited extent. It can be tasted in water when 0.01 mg chemical is present in 1 liter of water. It is a man-made chemical not found naturally in the environment. We do not know exactly how much of it is currently made or used by industry, but it is probably a small amount. Some industries use 1,2-dibromo-3-chloropropane to make a chemical that is used to make materials resistant to burning. Large amounts of 1,2-dibromo-3-chloropropane were used in the past on certain farms to kill pests that were harmful to the crops. Farmers in Hawaii stopped using this chemical in 1985; use in other states stopped in 1979.

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1,2-Dibromo-3-chloropropane breaks down slowly in the air. Most of the 1,2-dibromo-3-chloropropane that is released to the air disappears within several months. Most of this chemical that enters surface water evaporates into the air within several days or a week. It does not stick to the soil at the bottom of rivers, lakes, or ponds. We do not expect fish or other seafood from water containing 1,2-dibromo-3-chloropropane to build up large amounts of this chemical in their bodies. Some of what is spilled on or applied to soil moves through the soil into the groundwater, where it may remain for a long time. Some of the 1,2-dibromo-3-chloropropane in soil evaporates from the surface of the soil into the air. Small amounts may stay in the soil for several years. This chemical also breaks down slowly to simpler chemicals in water and soil.

1.2 HOW MIGHT I BE EXPOSED TO 1,2-DIBROMO-3-CHLOROPROPANE?

1,2-Dibromo-3-chloropropane is not usually found in the environment (air, water, and soil). Sometimes, however, it is found in the soil and underground water from cropland where it has been used as a pesticide. It has been found in well-water near farms where 1,2-dibromo-3-chloropropane was used. It has been found in food grown on farms that used the chemical and at some hazardous waste sites. Foods today most likely do not contain this chemical.

1,2-Dibromo-3-chloropropane can enter the environment while it is being made or used in industry and research. Because this chemical is not used very much, the releases are probably small. Releases and disposal of 1,2-dibromo-3-chloropropane at waste sites can lead to higher than usual levels in the nearby air, water, and soil.

We do not know exactly what amounts of 1,2-dibromo-3-chloropropane are usually found in the air, surface water, and soil. However, based on the limited usage in the past 5-10 years, we expect that levels where the chemical has not been used or discarded are either low or nonexistent. In areas where the chemical has been used as a soil fumigant, it may still be present in soil and groundwater at low levels.

You can be exposed to 1,2-dibromo-3-chloropropane by drinking water or eating certain foods that may still contain the compound. You might also be exposed to 1,2-dibromo-3-chloropropane by breathing air containing it. Exposure may happen if you live near a hazardous waste site that has released 1,2-dibromochloropropane to the air, water, or soil. Exposure can also occur in the workplace from spills or other accidents or even during routine handling. We do not know how much 1,2-dibromo-3-chloropropane the general public or workers are exposed to or how often they are exposed to it. However, the limited use of 1,2-dibromo-3-chloropropane in recent years suggests that exposure is minimal and infrequent.

1.3 HOW CAN 1,2-DIBROMO-3-CHLOROPROPANE ENTER AND LEAVE MY BODY?

1,2-Dibromo-3-chloropropane can enter your body through the lungs if you breathe air contaminated with it. It can also enter your body if you drink contaminated water or eat contaminated food. It can enter through your skin if it comes into contact with your skin. We do not know exactly how much or how fast 1,2-dibromo-3-chloropropane enters your body through your lungs after breathing it or

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through your skin after skin contact with it. Studies in animals show that almost all the 1,2-dibromo-3-chloropropane that they swallowed entered the bloodstream quickly. Inside the body, 1,2-dibromo-3-chloropropane is carried by the blood to many organs and breaks down into other chemicals also called breakdown products. These breakdown products can attach to some chemicals inside the cells of your body and may cause harmful effects in the liver, kidneys, or male reproductive organs. Most of the breakdown products are removed from your body quickly, but they may stay in fatty tissue for a longer period of time. The breakdown products of 1,2-dibromo-3-chloropropane leave the body in urine and in the air you breathe out. Only a small amount leaves in the stool.

1.4 HOW CAN 1,2-DIBROMO-3-CHLOROPROPANE AFFECT MY HEALTH?

Studies of workers in chemical factories that produced 1,2-dibromo-3-chloropropane showed that its main harmful effect is on male reproductive organs. Men exposed to 1,2-dibromo-3-chloropropane in the air may have more girl children than boy children, produce fewer sperm, and eventually become unable to father children. We do not know the exact levels of 1,2-dibromo-3-chloropropane in air that cause these effects. Studies of workers have also suggested that 1,2-dibromo-3-chloropropane may cause headache, nausea, lightheadedness, and weakness. No adverse effect on reproduction was seen in people who drank water contaminated with small amounts (0.004-5.75 parts in a billion parts of water) of 1,2-dibromo-3-chloropropane. Studies in animals show that 1,2-dibromo-3-chloropropane may cause birth defects in the offspring of adult rats exposed to large

amounts. However, human exposure to 1,2-dibromo-3-chloropropane that occurred at work or by drinking contaminated water has not been linked with birth defects. Some people have smelled the sharp odor of 1,2-dibromo-3-chloropropane when only small amounts were present, 2 parts in 1 million parts of air (2 ppm).

Some laboratory animals died after they breathed in, received large amounts in their food, or had skin contact with 1,2-dibromo-3-chloropropane. Rats and mice that survived breathing in or eating large amounts of 1,2-dibromo-3-chloropropane had damaged stomachs, livers, and kidneys. Incoordination and sleepiness were seen in animals that breathed or took large amounts of 1,2-dibromo-3-chloropropane by mouth. Animals that breathed large amounts of this chemical also had damaged brains. In addition, rats and mice that breathed large amounts in 1,2-dibromo-3-chloropropane had damaged air passages and lungs. Some laboratory animals that breathed large amounts of 1,2-dibromo-3-chloropropane had damaged spleens, low blood cell production in the bone marrow, or decreased amounts of blood cells in the blood. Rabbits that had 1,2-dibromo-3-chloropropane placed in contact with their eyes and skin had irritated eyes, cloudy corneas, and damaged skin. Female rats mated with male rats that received low-to-moderate doses of 1,2-dibromo-3-chloropropane in their food for 5 days had miscarriages. Rats and rabbits that breathed in or received low doses of 1,2-dibromo-3-chloropropane in their food for less than 1 year had harmful effects on their reproductive organs. Male offspring of rats that were exposed to 1,2-dibromo-3-chloropropane while they were pregnant also had harmful effects on their reproductive organs. Laboratory animals that were exposed to low-to-moderate amounts of

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1,2-dibromo-3-chloropropane through breathing, swallowing, or skin contact for a long time period developed cancer. Cancerous tumors on the inside of the nose were seen after animals breathed 1,2-dibromo-3-chloropropane for long periods. Cancer of the stomach and kidneys was seen after animals were given this chemical by mouth for long periods. Cancer of the stomach and skin was seen after animals had skin contact with this chemical for long periods. The Department of Health and Human Services has determined that 1,2-dibromo-3-chloropropane may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer has determined that 1,2-dibromo-3-chloropropane is possibly carcinogenic to humans.

1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,2-DIBROMO-3-CHLOROPROPANE?

1,2-Dibromo-3-chloropropane can be measured in exhaled air, blood, and samples of tissues from the body. Samples must be collected shortly after exposure because 1,2-dibromo-3-chloropropane leaves your body rapidly after exposure. If a large exposure has occurred, levels may be detected for longer after exposure than if a small exposure has occurred. The levels of 1,2-dibromo-3-chloropropane cannot be used to predict whether or not you will experience adverse health effects. These tests are probably not available through your doctor's office, but your doctor can refer you to a place where they can be done. Biological changes in the human body have been studied after 1,2-dibromo-3-chloropropane exposure, but they have not been used to tell whether exposure occurred.

Exposure to 1,2-dibromo-3-chloropropane causes lower production of sperm. Therefore, sperm counts and the blood levels of certain hormones (follicular stimulating hormone, luteinizing hormone) can be checked in exposed men to find out whether harmful effects have occurred. However, these changes have not been linked with exposure levels of the chemical or lengths of exposure to the chemical. Furthermore, the hormonal changes are not sensitive enough to detect minor changes in sperm counts.

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

The Environmental Protection Agency (EPA) recommends that the amount of 1,2-dibromo-3-chloropropane that is found in underground drinking water be kept to low levels. The highest recommended level is 100 micrograms of 1,2-dibromo-3-chloropropane per liter of water ($\mu\text{g/L}$). Furthermore, EPA requires that industries report spills of 1 pound or more of 1,2-dibromo-3-chloropropane. EPA banned the use of this chemical as a pesticide in the United States in the early 1980s.

The Occupational Safety and Health Administration (OSHA) recommends that the amount of 1,2-dibromo-3-chloropropane in workplace air be kept to low levels. The highest level allowed in the workplace is 1 part in one billion parts of air (ppb), for an 8-hour workday and a 40-hour workweek.

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**1.7 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). 1992. Toxicological profile for 1,2-
Dibromo-3-chloropropane. Atlanta, GA: U.S.
Department of Health and Human Services, Public
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www.atsdr.cdc.gov/

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