VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Virginia Department of Health
DIVISION OF ENVIRONMENTAL EPIDEMIOLOGY
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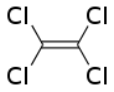
FREQUENTLY ASKED QUESTIONS ABOUT TETRACHLOROETHYLENE



What is tetrachloroethylene?

Tetrachloroethylene is a synthetic chemical that is widely used for dry cleaning fabrics and for metal-degreasing operations. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels. Other names for tetrachloroethylene include perchloroethylene, PCE, and PERC.

How might I be exposed to tetrachloroethylene?

Most exposures to tetrachloroethylene occur in the workplace through breathing vapor and direct contact with the liquid. More information about occupational exposure to tetrachloroethylene, and safe work practices can be found at www.osha.gov. Exposure to the general public typically occurs from environmental sources (contaminated air and water) and from consumer products. Products that may contain tetrachloroethylene include water repellents, silicone lubricants, fabric finishers, spot removers, adhesives, and wood cleaners. Common environmental levels of tetrachloroethylene (called background levels) are several thousand times lower than levels found in some workplaces. Water polluted with tetrachloroethylene may have levels greater than 1 ppm. In soil, background levels are typically 100–1,000 times lower than 1 ppm. However, the background level of tetrachloroethylene in air is usually less than 1 part in 1 billion parts of air (ppb). The air close to dry cleaning shops and tetrachloroethylene waste sites has levels of tetrachloroethylene higher than background levels.

What happens to tetrachloroethylene when it enters the environment?

Most of the tetrachloroethylene released into the environment comes from its use to remove grease from metals. It can also enter the air and water when it is disposed at waste sites. It evaporates easily, but can stay in the soil and in groundwater for a long time. Because tetrachloroethylene can travel through soils quite easily, it can get into underground drinking water supplies. If it gets into underground water, it may stay there for many months without being broken down. Tetrachloroethylene does not readily bioaccumulate in animals that live in water, such as fish, clams, and oysters.

How does tetrachloroethylene get into and leave the body?

Tetrachloroethylene enters the body through inhalation or ingestion. Tetrachloroethylene exits through the lungs during exhalation irrespective of the way it enters the body. A small amount of the tetrachloroethylene is metabolized (converted) by the liver into other chemicals that are then excreted in urine within a few days.

How can tetrachloroethylene affect my health?

Tetrachloroethylene has been used medicinally as a general anesthetic and at high concentrations is known to produce loss of consciousness. When concentrations in air are high—particularly in closed, poorly ventilated areas—acute exposures can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Results of animal studies, conducted with tetrachloroethylene at concentrations higher than those of typical exposures, have found that tetrachloroethylene can cause liver and kidney damage. Animal studies have also shown that offspring of pregnant animals exposed to excessive levels of tetrachloroethylene can develop behavior problems.

Does tetrachloroethylene cause cancer?

Although it has not been shown to cause cancer in people, the U.S. Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a human carcinogen based on. The International Agency for Research on Cancer (IARC) has determined that tetrachloroethylene is a probable human carcinogen. The U.S. Environmental Protection Agency (EPA) has classified tetrachloroethylene as likely to be carcinogenic in humans by all routes of exposure.

Is there a medical test to determine whether I have been exposed to tetrachloroethylene?

Tetrachloroethylene can be detected in human blood and breath. Breakdown products of tetrachloroethylene can also be detected in the blood and urine of exposed individuals. Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed only to tetrachloroethylene. Test results cannot determine the extent to which a person has been exposed to tetrachloroethylene, and cannot predict adverse health effects.

What is the air quality standard for tetrachloroethylene?

There is no standard for the amount of tetrachloroethylene in the indoor air of homes. However, there are standards for workplace air. The Occupational Safety and Health Administration (OSHA) permissible exposure limit is 100 ppm tetrachloroethylene in workplace air. This limit is based on an eight-hour time-weighted average for a 40-hour week.

What is the drinking water standard for tetrachloroethylene?

EPA sets the standards for public drinking water. These standards or limits are known as Maximum Contaminant Levels or MCLs. EPA's MCL for tetrachloroethylene is 0.005 mg/L in public drinking water. Consuming water with levels of tetrachloroethylene consistently above the MCL over a long period of time may increase the risk of adverse health effects.

What does VDH recommend if high levels of tetrachloroethylene are found in drinking water?

The Virginia Department of Health recommends installing a whole-house carbon filtration device to remove tetrachloroethylene contamination from drinking water.

Where can my physician or I get more information?

If you need further information regarding the health effects of tetrachloroethylene, please contact the Virginia Department of Health, Division of Environmental Epidemiology, 101 North 14th Street, 15th Floor, Richmond, VA 23219, or call (804) 864-8182.

Division of Environmental Epidemiology, 2018