



1,2-Dichloroethene (DCE)

Answers to Frequently Asked Questions

What is 1,2-DCE?

1,2-Dichloroethene (die-klor'oh-eh'theen), also called 1,2-DCE, is a clear, manmade liquid chemical that is not normally found in nature. 1,2-DCE evaporates (changes from liquid to gas) quickly when it touches air, burns easily, and has a harsh smell.

There are two kinds of 1,2-DCE called cis-1,2-DCE and trans-1,2-DCE. 1,2-DCE is used to make other chemical mixtures, used to produce plastic, and used for cleaning electronics and metal parts.

How does 1,2-DCE enter the environment?

1,2-DCE is created when other chemicals (like TCE and PCE) break down in the environment. This is the most common source of 1,2-DCE in Ohio.

1,2-DCE can also enter the environment when factories use it, spill it, or dispose of it in an unsafe way.

Once 1,2-DCE is in the environment, sunlight and microorganisms (very tiny living creatures) will slowly break it down. 1,2-DCE that evaporates into the air can stay there for many days. 1,2-DCE in surface water, like lakes and rivers, will mostly evaporate into the air. In soil, 1,2-DCE can either evaporate, or it can travel down into groundwater (underground sources of water) where it may stay for up to four months.

How can 1,2-DCE enter my body?

People are exposed to 1,2-DCE mainly by inhaling it (breathing it in) or by drinking water that has been contaminated (polluted) with it. Water that contains 1,2-DCE can create steam vapors that also contain 1,2-DCE.

Once 1,2-DCE is in a person's body, it may travel to many organs through their blood. After one or two days, most of it will be broken down into a gas and will leave through the breath and urine.

Who may be exposed to 1,2-DCE?

People living in or near cities may be more likely to be exposed to 1,2-DCE than people who live in rural areas or farmland. This is because industries that make and use 1,2-DCE are more likely to be in or near cities.

People who live near landfills or waste dumps may also be exposed to more 1,2-DCE than other people.

People working in factories that use 1,2-DCE may also be exposed to large amounts of 1,2-DCE. Without using the correct safety equipment, they may be in danger of inhaling large amounts of 1,2-DCE gas that is trapped indoors.



People who live near or work in factories that use 1,2-DCE or other chemicals that break down into 1,2-DCE are most likely to breathe or drink 1,2-DCE. (Image source: Shutterstock)

Can 1,2-DCE affect my health?

1,2-DCE can make you sick. Whether you will get sick from being exposed to 1,2-DCE depends on:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- Your overall age, health, and lifestyle.

What are the health effects of 1,2-DCE?

Breathing high levels of 1,2-DCE even for a short time can make you feel tired, dizzy, or sick to your stomach. Breathing very high levels of 1,2-DCE for too long can cause death.

In studies where scientists used laboratory animals, the animals that breathed high levels of 1,2-DCE for a long time had damage to their lungs, liver, and heart. The longer they breathed 1,2-DCE, the sicker they got.

Animals that were fed small amounts of 1,2-DCE by mouth had damage to their liver and blood cells. Animals that were fed large amounts of 1,2-DCE died.

Does 1,2-DCE cause cancer?

No, 1,2-DCE is not known to cause cancer.

How does 1,2-DCE affect children?

Babies and children can be exposed to 1,2-DCE the same way adults can. They can breathe 1,2-DCE gas in the air or drink it in water that has been contaminated. The health effects of 1,2-DCE in children have not been studied, but children would most likely have the same health problems as adults.

In pregnant animals who drank or breathed 1,2-DCE, their unborn babies did not grow as quickly as the unborn babies of other pregnant animals who did not get exposed to 1,2-DCE. It is not known if these results are also true for pregnant human mothers and babies.



Can a medical test show if I've been exposed to 1,2-DCE?

1,2-DCE can be measured in your blood, urine, and tissue (a sample of skin, fat, or organ). These tests are not often used because the results do not always show that you were exposed to 1,2-DCE and not another chemical.

Remember, a test can only tell you whether you have 1,2-DCE in your body or not. It cannot tell you if you will have health problems or where the 1,2-DCE came from.

How does the federal government protect me from 1,2-DCE?

The federal government makes regulations and recommendations to protect the public from the harmful effects of 1,2-DCE. Regulations can be enforced by law. Different agencies set guidelines for:

- Drinking water. The U.S. Environmental Protection Agency (EPA) does not allow more than 0.07 milligrams of cis-1,2-DCE in every 1 liter of water (or 0.07 parts per million). U.S. EPA does not allow more than 0.1 milligram of trans-1,2-DCE in every 1 liter of water (or 0.1 parts per million).
- Workplace air. For jobs where 1,2-DCE may be in the air, the National Institute for Occupational Safety and Health (NIOSH) recommends that workers should not be exposed to more than 200 parts 1,2-DCE to every million parts air.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1996. Toxicological profile for 1,2-Dichloroethene. U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

Ohio Department of Health
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