

ToxFAQs™ for

Chlorophenols

June 1999

This fact sheet answers the most frequently asked health questions about chlorophenols. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. 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.

HIGHLIGHTS: Chlorophenols are a group of compounds that are used in a number of industries and products. Exposure to high levels can cause damage to the liver and immune system. These substances have been found in at least 166 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are chlorophenols? (Pronounced klor'o fee-nolz')

Chlorophenols are a group of chemicals that are produced by adding chlorines to phenol. Phenol is an aromatic compound derived from benzene. There are 5 basic types of chlorophenols and 19 different chlorophenols.

Most chlorophenols are solid at room temperature. They have a strong, medicinal taste and smell. Small amounts can be tasted in water.

Some chlorophenols are used as pesticides. Others are used in antiseptics. Small amounts are produced when water is disinfected with chlorine. They are also produced while bleaching wood pulp with chlorine to make paper.

What happens to chlorophenols when they enter the environment?

- Chlorophenols can enter the environment when they are being made or used as pesticides.

- Most chlorophenols released to the environment go into water.
- Small amounts of chlorophenols enter the air.
- In the air, sunlight helps destroy these compounds and rain washes them out of the air.
- Chlorophenols stick to soil and sediments at the bottom of lakes, streams, and rivers.
- Low levels of chlorophenols in water, soil, or sediment are broken down and removed from the environment in a few days to weeks by microorganisms.

How might I be exposed to chlorophenols?

- Most people are exposed to very low levels of chlorophenols in chlorinated drinking water.
- There are some chlorophenols in city air.
- You can be exposed if you work with chlorophenols or use them as pesticides.
- You can be exposed if you make or use treated wood.

How can chlorophenols affect my health?

Workers exposed to pesticides that contain chlorophenols have developed acne and mild injury to their livers.

In laboratory studies, animals that received high levels of chlorophenols in food or water developed liver and immune system effects. They did not gain as much weight as animals not fed the compounds.

High levels of chlorophenols given to pregnant female rats in their drinking water reduced the number of babies they had, and caused low birth weights. Chlorophenols have not been shown to cause birth defects in animals.

How likely are chlorophenols to cause cancer?

There is evidence to suggest that people exposed to chlorophenols for a long time may have slightly higher incidences of cancer. However, the people studied were exposed to other chemicals as well.

In animal studies, one chlorophenol, 2,4,6-trichlorophenol, caused leukemia in rats and liver cancer in mice. The Department of Health and Human Services (DHHS) has determined that 2,4,6-trichlorophenol may reasonably be anticipated to be a carcinogen.

How can chlorophenols affect children?

Children can be exposed in the same ways as adults; however, children may be more sensitive than adults to the effects of chlorophenol-based pesticides and herbicides. Chlorophenols leave the body quickly, so they are not likely to accumulate in the mother's tissues or breast milk.

There are no human studies on the effects of chlorophenols on developing fetuses. Studies in rats showed that chlorophenols can pass through the placenta and produce toxic effects to the

developing fetuses. The most common problems are delayed hardening of the bones of the breastbone, spine, and skull.

How can families reduce the risk of exposure to chlorophenols?

Parents should keep children away from areas where chlorophenols have been used as pesticides. Always check labels on household products, and store them safely in their original containers. Never store chemicals in containers that children might find attractive to eat or drink from, such as soda bottles.

Is there a medical test to show whether I've been exposed to chlorophenols?

There is no test to show if you have been exposed to chlorophenols. There are tests for certain compounds that are produced in your body when chlorophenols break down. However, exposure to other substances could also produce the same test results.

Has the federal government made recommendations to protect human health?

EPA recommends that drinking water contain no more than 0.04 milligrams per liter (0.04 mg/L) of 2-chlorophenol for a lifetime exposure for an adult, and 0.05 mg/L for a 1-day, 10-day, or longer exposure for a child.

For 2,4-dichlorophenol, EPA recommends that drinking water contain no more than 0.03 mg/L for a 1-day, 10-day, or longer exposure for a child.

Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for chlorophenols. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
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