

This fact sheet answers the most frequently asked health questions (FAQs) about cresols. For more information, 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. It is important you understand this information because these substances 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: Exposure to cresols occurs mainly from breathing air containing car exhaust, air from homes heated with coal or wood, and smoking cigarettes. Cresols are corrosive and high levels can cause skin burns and internal burns if ingested, in addition to liver and kidney damage, and possibly death. Low levels may cause eye, nose, and throat irritation. *o*-Cresol, *m*-cresol, *p*-cresol, and mixed cresols have been found in at least 210, 22, 310, and 70 of the 1,678 current or former National Priority List sites, respectively, identified by the Environmental Protection Agency (EPA).

What are cresols?

Cresols are a widely occurring natural and manufactured group of chemicals. In their pure form, they are colorless solids and may be liquids if they are mixtures. Cresols smell like medicine.

There are three forms of cresols that differ slightly in their chemical structure: *ortho*-cresol (*o*-cresol), *meta*-cresol (*m*-cresol), and *para*-cresol (*p*-cresol). These forms occur separately or as a mixture. Cresols are used to dissolve other chemicals, as disinfectants and deodorizers, and to make other chemicals.

Cresols may be formed normally in the body from other compounds. Cresols are found in many foods and in wood and tobacco smoke, crude oil, coal tar, and in chemical mixtures used as wood preservatives. Small organisms in soil and water produce cresols when they break down materials in the environment.

What happens to cresols when they enter the environment?

- Cresols enter the environment from natural sources, car exhaust, combustion, manufacture and use, and waste sites.
- In air, cresols quickly break down into other chemicals.
- Cresols evaporate slowly from soil and water surfaces, but can be quickly degraded by bacteria.

- Cresols do not attach strongly to soils; therefore, they may move into groundwater below the soil surface.
- Cresols may last longer in deep groundwater or water that does not have bacteria.
- In soil, half the total amount of cresols will break down in about a week.
- Cresols do not seem to accumulate in fish or other organisms.

How might I be exposed to cresols?

- Breathing contaminated air from car exhaust, coal or wood combustion, oil refineries, or cigarette smoke.
- If you work in a place that manufactures or uses cresols you may be exposed by breathing air or by skin contact.
- Eating foods, including ketchup, tomatoes, cheese, butter, and bacon, or drinking beverages such as coffee, black tea, whiskey, brandy, and rum, but generally the levels are low and not harmful.
- Drinking contaminated water near garbage dumps or hazardous waste sites where cresols may be stored or buried.

How can cresols affect my health?

Most exposures to cresols are at very low levels that are not harmful, but cresols breathed, ingested, or applied to the skin at very high levels, can be very harmful because they are corrosive substances. Inhalation of high levels of

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cresols for a short time results in irritation of the eyes, nose, and throat. Very little else is known about the effects of breathing cresols. Ingestion of high levels results in mouth and throat burns, abdominal pain, vomiting, kidney problems, and effects on the blood and nervous system. Skin contact with high levels of cresols can burn the skin and damage the kidneys, liver, blood, lungs, and brain. Death may occur in both cases. It is not known what the effects are from long-term ingestion or skin contact with low levels of cresols.

Studies in animals have shown similar effects from exposure to cresol except for one study that found lesions inside the nose of rats and mice after eating food contaminated with mostly *p*-cresol and a mixture of *m*- and *p*-cresol. Animal studies suggest that cresols probably would not affect reproduction in humans.

How likely are cresols to cause cancer?

No human studies are available on the carcinogenic effects of cresols. Animal studies show that cresols may increase the ability of some carcinogenic chemicals to cause tumors.

The EPA has determined that cresols are possible human carcinogens.

How can cresols affect children?

Children can be exposed to cresols the same way adults might be exposed. There is no unique way of exposure for children. There are no studies of children exposed to cresols, but a baby who had a solution of cresol accidentally spilled on his head suffered serious damage to the skin, liver, and kidneys, became comatose, and died within 4 hours of the accident.

We do not know whether exposure of pregnant women to cresols can harm the unborn child. Studies in animals indicate that exposure during pregnancy at levels that harm the mother can also adversely affect the fetus. There are no reports of cresols in maternal milk.

How can families reduce the risks of exposure to cresols?

- Avoiding environmental tobacco smoke, which contains cresols, will reduce exposures to cresols.
- Avoiding areas of high traffic, manufacturing plants, or hazardous waste sites will reduce the risk of exposure to cresols.

Is there a medical test to determine whether I've been exposed to cresols?

Tests are available that measure the amount of cresols in the urine. The test must be performed within 1 day of exposure since cresols break down quickly in the body.

Since cresols occur naturally in the body, results of tests for cresols exposure would have to be compared to results of tests taken from the same person either before exposure or several days after exposure. These tests are not routinely performed at your doctor's office, but your doctor can collect samples and send them to a testing laboratory.

Has the federal government made recommendations to protect human health?

The EPA requires that spills of 100 pounds or more of cresols to the environment be reported to the Agency.

The Occupational Safety and Health Administration (OSHA) has set a limit of 5 parts per million (ppm) for cresols in air to protect workers during 8-hour work shifts.

The National Institute for Occupational Safety and Health (NIOSH) recommends that workers be exposed to no more than 2.3 ppm of cresols in work place air as an average during a 10-hour workday. NIOSH also considers a concentration of 250 ppm of cresols in air as Immediately Dangerous to Life or Health.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Cresols (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. 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.

