

This fact sheet answers the most frequently asked health questions (FAQs) about hydrogen chloride. 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 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: People working in occupations in which hydrogen chloride is used have the highest risk of being exposed to this compound. Exposure of the general population is minimal. Hydrogen chloride gas can cause irritation of the eyes, skin, and respiratory tract. Exposure to high levels can result in corrosive damage to the eyes, skin, and respiratory tissues, and could lead to pulmonary edema and even death in extreme cases. This substance has been found in at least 63 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is hydrogen chloride?

At room temperature, hydrogen chloride is a colorless to slightly yellow, corrosive, nonflammable gas that is heavier than air and has a strong irritating odor. On exposure to air, hydrogen chloride forms dense white corrosive vapors. Hydrogen chloride can be released from volcanoes.

Hydrogen chloride has many uses, including cleaning, pickling, electroplating metals, tanning leather, and refining and producing a wide variety of products. Hydrogen chloride can be formed during the burning of many plastics. Upon contact with water, it forms hydrochloric acid. Both hydrogen chloride and hydrochloric acid are corrosive.

What happens to hydrogen chloride when it enters the environment?

- Hydrogen chloride released to the atmosphere will be removed by rainfall.
- Hydrogen chloride dissociates readily in water to chloride and hydronium ions (an ion is an electrically charged atom

or molecule), which ultimately lowers the pH of the water (makes it more acidic).

- If released to soil, hydrogen chloride will evaporate from dry soil surfaces and dissociate into chloride anions and hydronium ions in moist soil.
- Hydrogen chloride does not accumulate in the food chain.

How might I be exposed to hydrogen chloride?

- You may breathe in air that contains very low levels of hydrogen chloride gas. Naturally-occurring (i.e., from volcanic eruptions) and other releases of hydrogen chloride are removed by rainfall, limiting the chances of exposure to high levels of this compound by breathing ambient air.
- Hydrogen chloride is used to produce other chemicals, or for applications such as a metal pickling, ore refining, food processing, manufacture of fertilizers and dyes, and in the rubber and textile industries. Workers in these occupations may inhale hydrogen chloride or get it on their skin.
- Soldering materials often contain hydrogen chloride and you may be exposed if you use these products during soldering.

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

How can hydrogen chloride affect my health?

Hydrogen chloride is irritating and corrosive to any tissue it contacts. Brief exposure to low levels causes throat irritation. Exposure to higher levels can result in rapid breathing, narrowing of the bronchioles, blue coloring of the skin, accumulation of fluid in the lungs, and even death. Exposure to even higher levels can cause swelling and spasm of the throat and suffocation. Some people may develop an inflammatory reaction to hydrogen chloride. This condition is called reactive airways dysfunction syndrome (RADS), a type of asthma caused by some irritating or corrosive substances.

Depending on the concentration, hydrogen chloride can produce from mild irritation to severe burns of the eyes and skin. Long-term exposure to low levels can cause respiratory problems, eye and skin irritation, and discoloration of the teeth.

Swallowing concentrated hydrochloric acid will cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.

We do not know if exposure to hydrogen chloride can result in reproductive effects.

How likely is hydrogen chloride to cause cancer?

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified hydrogen chloride as to its carcinogenicity. IARC considers hydrochloric acid to be not classifiable as to its carcinogenicity to humans.

How can hydrogen chloride affect children?

Children are probably affected by exposure to hydrogen chloride in the same ways as adults. We do not know

whether children differ from adults in their susceptibility to hydrogen chloride. In general, children may be more vulnerable to corrosive agents than adults because of the smaller diameter of their airways.

We do not know if exposure to hydrogen chloride can result in birth defects or other developmental effects.

How can families reduce the risk of exposure to hydrogen chloride?

- Most families will not be exposed to significant levels of hydrogen chloride gas.
- Household products containing hydrochloric acid should be stored in safe containers, in safe locations, out of the reach of children.

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

Specific tests for the presence of hydrogen chloride in the blood or urine are not generally useful. If a severe exposure has occurred, blood and urine analyses and other tests may show whether damage has occurred to the lungs or gastrointestinal tract. Some of these tests can be performed in a doctor's office. Some testing may require hospital facilities.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a ceiling limit of 5 parts of hydrogen chloride per million parts of air (5 ppm) in workplace air.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address 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.

