

Frequently Asked Questions About

HYDROGEN FLUORIDE

What is hydrogen fluoride?

Hydrogen fluoride (HF) is a colorless gas composed of the elements hydrogen and fluorine. It dissolves in water to make hydrofluoric acid. In high concentrations, both hydrogen fluoride and hydrofluoric acid are very corrosive.

Where can hydrogen fluoride be found in the environment?

A significant amount of naturally occurring hydrogen fluoride is released into the air by volcanoes. Weathering of fluoride-containing rocks is an important natural source of this mineral in soil, sediment, and groundwater. In the western U.S., rocks and soils naturally have higher than average fluoride concentrations, so more fluoride is present in that region's groundwater. Hydrogen fluoride and hydrofluoric acid can react with and are neutralized by other substances to form mineral fluorides—materials that are found naturally in soil, oceans, and volcanoes.

Manmade releases of fluorides to the environment are due to the use of fertilizers, disposal of industrial waste, and fossil fuel combustion. Manufacturers of steel, brick, tile, and aluminum also release large amounts of hydrogen fluoride.

How is hydrogen fluoride used?

Hydrogen fluoride is an important industrial chemical used for fabricating aluminum and stainless steel as well as for etching circuit boards and glass. The largest uses of hydrofluoric acid occur during the production of petrochemicals, glass, ceramics, resins, solvents, stain removers, and pharmaceuticals. In the past, hydrogen fluoride was used for producing chlorofluorocarbons, but it is no longer used for that purpose.

Do electric utilities release hydrogen fluoride into the environment?

Yes. Coal and oil contain very small amounts of fluoride which are released during combustion processes. Pollution control devices operate in many power plants to help reduce these emissions.

Of the total industrial releases in 2006, power plants released 29,779 tons of hydrogen fluoride into the environment, accounting for approximately 81 percent of total industrial releases reported to the Environmental Protection Agency (EPA) that year. According to EPA, all reporting industries combined released 36,886 tons of hydrogen fluoride in 2006.

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continued

How could I be exposed to hydrogen fluoride? Will exposure affect me?

Exposure to hydrogen fluoride can occur by breathing air droplets containing it or by drinking water, especially groundwater, that is contaminated with it. However, ingesting fluoride in either of these ways does not present a health risk. Fluoride is a naturally occurring element, so humans are regularly exposed to the small amounts already present in the environment. In addition, a certain amount of fluoride is recommended for good dental health.

Hydrofluoric acid is corrosive to skin and eyes. Skin contact with concentrated acid can cause burning and irritation. Inhaling large quantities of hydrofluoric acid or hydrogen fluoride can cause coughing or bronchitis. In extremely rare cases, ingesting large amounts of hydrofluoric acid can be fatal. Exposure to above normal levels of hydrogen fluoride has not been found to cause cancer.

What do EPA and other experts say about hydrogen fluoride?

In its 1998 report to Congress, EPA reported that hydrogen fluoride in air measured from 600 power plants would never reach unhealthy levels in the U.S. In fact, the agency estimates that the long-term concentration of hydrogen fluoride in the air around power plants is 100 to 10,000 times below the level that may cause adverse health effects.

EPA has identified hydrogen fluoride as a hazardous substance, and regulates its levels in drinking water. The Occupational Safety and Health Administration regulates permissible levels in workplace air.

Where can I get more information?

- Electric Power Research Institute, 3412 Hillview Ave., P.O. Box 10412, Palo Alto, CA 94303; (800) 313-EPRI; <http://www.epri.com>
- U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 200 Independence Ave., S.W., Washington, D.C. 20201; (877) 696-6775; <http://www.atsdr.cdc.gov/>
- U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., N.W., Washington, D.C. 20460; (202) 260-2090; <http://www.epa.gov/>



**EDISON ELECTRIC
INSTITUTE**

701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2696
202-508-5000
www.eei.org

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