

Product Safety Summary

Potassium Bifluoride

CAS No. : 7789-29-9

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found in the Material Safety Data Sheet (MSDS) for the chemical substance.

Names

- Potassium bifluoride (KBF)
- Potassium difluoride
- Potassium acid fluoride
- Potassium hydrogen difluoride
- Potassium fluoride compound with hydrogen fluoride (1:1)

Product Overview

Potassium bifluoride (KBF) is used as an abrasive, as a metal pretreatment before further processing, as a wood preservative and as a chemical intermediate. KBF is sold as a solid.

Solvay Fluorides LLC does not sell potassium bifluoride directly to consumers. Most potassium bifluoride is used in industrial applications and processes.

Potassium bifluoride is a corrosive chemical and contact can severely irritate and burn the skin or eyes causing possible permanent eye damage. Breathing potassium bifluoride dust can severely irritate and burn the nose, throat, and lungs, causing nosebleeds, cough, wheezing and shortness of breath. On contact with water or moist skin, KBF can release hydrofluoric acid, a very dangerous acid. When heated, potassium bifluoride releases hydrogen fluoride, a toxic, corrosive gas.

Inhalation or ingestion of large amounts of potassium bifluoride can cause nausea, vomiting and loss of appetite. Exposure to high concentrations or long term exposure can cause fluoride poisoning with stomach pain, weakness, convulsions and death. Long term or



repeated exposures can cause deposits of fluorides in bones and teeth, a condition called fluorosis. Fluorosis may cause pain, disability and discoloration of teeth.

Manufacture of Product

The potassium bifluoride market in North America is estimated to be between 200 and 400 thousand pounds per year. Solvay Fluorides, LLC imports the potassium bifluoride it sells from an affiliated company in Europe.

- Potassium bifluoride is manufactured by mixing anhydrous hydrogen fluoride (liquid) together and potassium hydroxide and then drying to form powder.



Product Description

Potassium bifluoride (KBF) is only sold in solid form. The solid is a white crystalline powder with a pungent odor. Typical physical properties for potassium bifluoride are provided in Table 1.

Table 1: Typical physical properties of Potassium Bifluoride

	KBF
Melting point	437° F (225° C)
Boiling point	Decomposes before boiling >752° F (400° C)
Density	2.37 (2370 g/l; 130.5 lbs/ft ³)
pH (0.8% solution)	1
Flash point	Non- flammable

Product Uses

Potassium bifluoride (KBF) is used as an abrasive, as a pretreatment of metals before they are further processed, as a wood preservative and as a chemical intermediate.



Solvay Fluorides LLC does not sell potassium bifluoride directly for consumer use. Some potassium bifluoride may be used in consumer products for etching glass or for cleaning ceramics.

Exposure Potential

- **Workplace exposure** – Potassium bifluoride is corrosive and toxic by ingestion, inhalation or contact with skin and eyes. Exposures can occur at a potassium bifluoride (KBF) manufacturing facility or a manufacturing, packaging or storage facility that handles KBF. Exposure may also occur in the event of a transportation incident. Manufacturing processes or systems where potassium bifluoride is used are usually 'closed' (not exposed to the environment) in order to prevent the evolution of hydrogen fluoride (HF) vapor. Persons involved in maintenance, sampling and testing activities, or in the loading and unloading of KBF containers are at greater risk of exposure. Following good industrial hygiene practices will minimize the likelihood of KBF or HF exposure; however, persons involved in higher risk activities should always wear proper personal protective equipment such as rubber gloves and boots, an acid suit, goggles and a hard hat. In instances where the potential for splashes is high, a face shield should also be worn. In instances where the likelihood of exposure to HF vapor is present, appropriate respiratory protection should be worn.

Exposure limits for potassium bifluoride made by OSHA, ACGIH and other agencies list limits for the "fluoride" content rather than as KBF specifically. Please consult the [Material Safety Data Sheet](#) for information concerning exposure limits.

- **Consumer exposure to products containing potassium bifluoride** - Although Solvay Fluorides LLC does not sell potassium bifluoride directly to consumers, it is used in some consumer cleaning products. The user should use these products in strict adherence with the manufacturer's use and/or label instructions.
- **Environmental releases** - Spills of potassium bifluoride should be contained and isolated from waterways and sewers or drains. Small spills of solid potassium bifluoride should be swept or shoveled up and placed in suitable containers for disposal. The contaminated area should be washed down with plenty of water. Lime or calcium hydroxide may be used to neutralize contaminated water and immobilize the fluoride ions as calcium fluoride. Disposal should be in accordance with applicable local, state or federal regulations. Persons attempting to clean up potassium bifluoride spills should wear proper personal protective equipment (See guidelines in the workplace exposure

section of this document or the [Material Safety Data Sheet](#)). If required, report spills to the appropriate state or federal authorities.

- **Fires** - Fires involving potassium bifluoride should be extinguished using measures appropriate to the circumstances and surrounding environment. Hazardous decomposition products such as hydrogen fluoride vapor can be generated if KBF is involved in a fire. Fire fighters should wear self-contained breathing apparatus and protective suits.

For additional information concerning potassium bifluoride emergency response procedures, please consult the [Material Safety Data Sheet](#).

Health Information

Potassium bifluoride is corrosive and toxic by ingestion, inhalation or contact with skin and eyes. During most exposures, potassium bifluoride will dissociate to release hydrofluoric acid. Effects can be immediate or may be delayed for as long as 24 hours, so treatment should be given if exposure is suspected. First aid techniques for treatment to hydrofluoric acid exposures are unique and exposure to even low levels of HF require a rapid response and the use of calcium (most commonly calcium gluconate solutions or gels) to scavenge and neutralize the fluoride ion. Please consult the [Material Safety Data Sheet](#) for additional information.

Concentrations of potassium bifluoride typically found in consumer products may pose risk of symptoms due to skin, ingestion or inhalation exposure. Persons suffering from eye or ingestion exposure to consumer strength potassium bifluoride products may experience symptoms similar to persons exposed to industrial strength potassium bifluoride (see below).

Exposures to potassium bifluoride can produce the following adverse health affects:

- **Contact** - Skin exposures can cause symptoms ranging from minor skin irritation to painful redness and swelling. Severe burns can occur if treatment is delayed after exposure to potassium bifluoride. Eye exposure to potassium bifluoride may result in severe eye irritation, burns or even blindness.
- **Inhalation** - The inhalation of potassium bifluoride dust can cause symptoms ranging from nose and throat irritation to coughing and difficulty breathing. Aspiration of KBF solutions may cause pulmonary edema (fluid in the lungs), pneumonitis (inflammation of the lungs), hypocalcemia (low serum calcium), nervous system disorders (tetany) and cardiac arrhythmia (irregular heart beat) and/or spasms.



- **Ingestion** - The ingestion of potassium bifluoride may cause burns of the mouth and throat and perforation of the esophagus and stomach. Nausea, bloody vomiting, abdominal pain, diarrhea, difficulty breathing, swelling of the throat, loss of consciousness, coma and heart failure can also occur. The ingestion of potassium bifluoride may be fatal.
- **Other Effects** - The International Agency for Research on Cancer (IARC) has not determined potassium bifluoride to be carcinogenic (cancer causing).

For more information on health effects and routes of exposure, or for information concerning proper first aid measures, please consult the [Material Safety Data Sheet](#).

Environmental Information

Potassium bifluoride is not known to bioaccumulate or persist in the environment more than a few days. However it will decompose in moist environments liberating hydrofluoric acid. For more ecological and environmental information concerning this product, please consult the [Material Safety Data Sheet](#).

Physical Hazard Information

Potassium bifluoride is corrosive and can corrode most metals. It is not flammable or explosive. Potassium bifluoride will react with water (including perspiration) to form hydrofluoric acid.

Exposure of potassium bifluoride to strong acids, strong bases, metals, glass water or high temperatures can cause decomposition. Decomposition of potassium bifluoride will result in the liberation of hydrogen fluoride gas.

For more information concerning the physical hazards of this product, please consult the [Material Safety Data Sheet](#).

Regulatory Information

Regulations may exist that govern the manufacture, sale, export, import, storage, transportation, use and/or disposal of this chemical. These regulations can vary by city, state, country or geographic region. Information may be found by consulting the relevant [Material Safety Data Sheet](#) specific to your country or region.



Additional Information

- Solvay America, Inc. www.solvaynorthamerica.com
- Solvay Chemicals, Inc. www.solvaychemicals.us
- Solvay Chemicals Inc. Material Safety Data Sheets
www.solvaychemicals.us/EN/Literature/LiteratureDocuments.aspx
- Contact Solvay Chemicals, Inc. solvaychemicals.us@solvay.com
- NJ Department of Health & Senior Services Hazardous Substance Fact Sheets
<http://web.doh.state.nj.us/rtkhsfs/factsheets.aspx>
- This summary was prepared in June, 2010.

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