

Product Safety Summary

Sodium Bifluoride

CAS No. : 1333-83-1

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

- Sodium bifluoride (SBF)
- Sodium difluoride
- Sodium acid fluoride
- Sodium hydrogen difluoride ($\text{Na}(\text{HF}_2)$)
- Sodium fluoride compound with hydrogen fluoride (1:1) ($\text{NaF}\cdot\text{HF}$)

Product Overview

Sodium bifluoride (SBF) is used in the process to plate metal cans. It is also used in metal plating or surface pretreatment and several other uses. Sodium bifluoride is sold as a solid.

Solvay Fluorides, LLC does not sell sodium bifluoride directly to consumers. The majority of sodium bifluoride is used in industrial applications and processes.

Sodium bifluoride is a corrosive chemical and contact can severely irritate and burn the skin or eyes causing possible permanent eye damage. Breathing sodium 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, SBF can release hydrofluoric acid, a very dangerous acid. When heated, sodium bifluoride releases hydrogen fluoride, a toxic, corrosive gas.

Inhalation or ingestion of large amounts of sodium 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 sodium bifluoride market in North America is estimated to be between 400 and 500 thousand pounds. Solvay Fluorides, LLC currently imports sodium bifluoride, although it has made SBF at its North American production facility in the central United States in the past.

- Sodium bifluoride is manufactured by mixing anhydrous hydrogen fluoride (liquid) and sodium hydroxide and drying to form powder.



- It may also be made by treating other fluoride salts with sodium hydroxide and drying to form crystals.

Product Description

Sodium bifluoride is only sold in solid form. The solid is a white, hygroscopic (absorbs water) crystalline powder with pungent odor. Typical physical properties for sodium bifluoride are provided in Table 1.

Table 1: Typical physical properties of Sodium Bifluoride

	SBF
Melting point	Decomposes before melting > 320° F (160° C)
Density	2.08 (2080 g/l; 114 lbs/ft ³)
pH (0.6% solution)	1
Flash point	Non- flammable

Product Uses

Sodium bifluoride (SBF) is primarily used in the process to plate metal cans. Other uses include formulation in brick, stone and masonry cleaning products, metal plating and



surface pretreatment applications and for pH adjustment in industrial textile processing facilities or laundries. SBF can also be used to etch glass.

Solvay Fluorides LLC does not sell sodium bifluoride directly for consumer use. Some sodium bifluoride may be used in consumer products for the etching of glass (hobby) or for ceramic cleaners.

Exposure Potential

- **Workplace exposure** – Sodium bifluoride is corrosive and toxic by ingestion, inhalation or contact with skin and eyes. Exposures can occur at a sodium bifluoride (SBF) manufacturing facility or a manufacturing, packaging or storage facility that handles SBF. Exposure may also occur in the event of a transportation incident. Manufacturing processes or systems where sodium 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 SBF containers are at greater risk of exposure. Following good industrial hygiene practices will minimize the likelihood of SBF 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 sodium 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 sodium bifluoride** - Although Solvay Fluorides LLC does not sell sodium 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 sodium bifluoride should be contained and isolated from waterways and sewers or drains. Small spills of solid sodium 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 sodium 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 sodium 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 SBF is involved in a fire. Fire fighters should wear self-contained breathing apparatus and protective suits.

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

Health Information

Sodium bifluoride is corrosive and toxic by ingestion, inhalation or contact with skin and eyes. During most exposures, sodium 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 sodium 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 sodium bifluoride products may experience symptoms similar to persons exposed to industrial strength sodium bifluoride (see below).

Exposures to sodium 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 sodium bifluoride. Eye exposure to sodium bifluoride may result in severe eye irritation, burns or even blindness.
- **Inhalation** - The inhalation of sodium bifluoride (dust or HF vapors from SBF decomposition can cause symptoms ranging from nose and throat irritation to coughing and difficulty breathing. Aspiration of SBF solutions may cause pulmonary edema (fluid on the lungs) and pneumonitis (inflammation of the lungs). Repeated or prolonged exposures may cause sore throat, nosebleeds and chronic bronchitis. Prolonged



exposure may cause hypocalcemia (reduced calcium levels) with nervous problems (tetany) and cardiac arrhythmia (irregular heart beat), and/or spasms.

- **Ingestion** - The ingestion of sodium 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 sodium bifluoride may be fatal.
- **Other Effects** - The International Agency for Research on Cancer (IARC) has not determined sodium 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

Sodium 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

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

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

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.

NOTICE

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay America, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by persons at their own discretion and risk and does not relate to use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes. Solvay America, Inc. reserves the right to make additions, deletions or modifications to the information at any time without prior notification. Trademarks and/or other products of the company referenced herein are either trademarks or registered trademarks of the company mentioned or its affiliates, unless otherwise indicated.

