

## Product Safety Summary

### Sodium Fluoride

CAS No. : 7681-49-4

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 fluoride (SF)
- Natrium fluoride
- Sodium monofluoride (NaF)

#### Product Overview

Sodium fluoride is used for water fluoridation, as a metal surface treatment and cleaner, as a glass etchant, and for pH adjustment in industrial textile processing or laundries. When added to toothpaste it increases the strength of teeth by the formation of fluorapatite, a naturally occurring component of tooth enamel. Sodium fluoride is also used as a wood preservative and an insecticide.

Solvay Chemicals, Inc. does not sell sodium fluoride directly to consumers. Most sodium fluoride is used in industrial applications and processes.

Sodium fluoride is a toxic chemical and contact can severely irritate the skin or eyes. Breathing sodium fluoride dust can irritate the nose, throat, and lungs. Contact of sodium fluoride with water or extended skin contact can release hydrofluoric acid, a very dangerous acid.

Inhalation or ingestion of large amounts of sodium fluoride can cause nausea, vomiting and loss of appetite. Exposure to high concentrations or long term exposure to lower concentrations can cause fluoride poisoning with stomach pain, weakness, convulsions, collapse and death. It can also cause deposits of fluorides in bones and teeth, a condition called Fluorosis. This may cause pain, disability and discoloration. ***The above health***



**effects do NOT occur with the levels of sodium fluoride typically used in water for preventing cavities in teeth (water fluoridation).**

### Manufacture of Product

- The sodium fluoride market in North America is 10-13 million pounds. Solvay Chemicals, Inc., through its subsidiary Solvay Fluorides, LLC., currently imports its sodium fluoride, although it has made SF at its North American production facility in the central United States in the past. All Solvay Fluorides' sodium fluoride is certified to meet or exceed the purity required for use in water fluoridation systems. Composition and quality requirements for that use are governed by NSF International / ANSI (American National Standards Institute) Standard 60 and American Water Works Association Standard B701.
- Solid sodium fluoride is usually made by neutralizing hydrofluoric acid with sodium hydroxide and then drying to form crystals.



### Product Description

Sodium fluoride (SF) is a solid. The solid is an odorless, white crystal. Typical physical properties for Sodium fluoride are provided in Table 1.

Table 1: Typical physical properties sodium fluoride

|                         |                                 |
|-------------------------|---------------------------------|
| <b>Melting point</b>    | approx. 1818°F (992°C)          |
| <b>Bulk Density</b>     | 1,000 – 1,400 kg/m <sup>3</sup> |
| <b>Solubility</b>       | 42 g/l<br>@ 68 °F (20°C )       |
| <b>pH @ 20°C (68°F)</b> | 7.4<br>saturated solution       |
| <b>Flash point</b>      | Non- flammable                  |
| <b>Vapor Pressure</b>   | 1.33 hPa<br>@ 1971°F (1070°C)   |

## Product Uses

Sodium fluoride is used for water fluoridation, as a metal surface treatment and cleaner, as a glass etchant, and for pH adjustment in industrial textile processing or laundries. When added to toothpaste it increases the strength of teeth by the formation of fluorapatite, a naturally occurring component of tooth enamel. Sodium fluoride is also used as a wood preservative and an insecticide.

## Exposure Potential

- **Workplace exposure** - Exposure can occur at either a sodium fluoride manufacturing facility or a manufacturing, packaging or storage facility that handles sodium fluoride. Exposure may also occur in the event of a transportation incident. Persons involved in maintenance, sampling and testing activities, or in the loading and unloading of sodium fluoride packages are at greater risk of exposure. Following good industrial hygiene practices will minimize the likelihood of exposure; however, persons involved in higher risk activities should always wear proper personal protective equipment such as rubber gloves and boots, respiratory protection, goggles and a hard hat.

Please consult the [Material Safety Data Sheet](#) for occupational exposure limits.

**Consumer exposure to products containing sodium fluoride** - Solvay Fluorides does not sell sodium fluoride directly to consumers. Users should follow manufacturer's use and/or label instructions if sodium fluoride is listed as a component. ***Adverse health effects do NOT occur with the levels of sodium fluoride typically used in water for preventing cavities in teeth (water fluoridation).***

- **Environmental releases** - Spills of sodium fluoride should be contained and isolated from waterways and sewers or drains. Small spills of solid sodium fluoride 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 the 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 fluoride 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 fluoride should be extinguished using measures appropriate to the circumstances and surrounding environment. Hazardous decomposition products may be generated. Fire fighters should wear self-contained breathing apparatus and protective suits.

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

## Health Information

The concentrations of sodium fluoride potentially found in consumer products may pose risk of symptoms due to skin, ingestion or inhalation exposure. Persons suffering from eye or ingestion exposure to certain consumer strength sodium fluoride products may experience symptoms similar to persons exposed to industrial strength sodium fluoride (see below).

Exposures to industrial strength sodium fluoride can produce the following adverse health affects:

- **Contact** - Skin exposures can cause moderate eye and skin irritation. Burns can occur if treatment is delayed after exposure to sodium fluoride.
- **Inhalation** - The inhalation of sodium fluoride dust can cause nose and throat irritation. Prolonged exposures may cause sore throat, nosebleeds and chronic bronchitis. High concentration exposures may cause hypocalcemia with nervous system disorders (tetany) and cardiac arrhythmia (reduced calcium levels, spasms and irregular heart beat). Chronic inhalation of sodium fluoride can cause skeletal fluorosis (adverse changes in bone structure.)
- **Ingestion** - The ingestion of sodium fluoride may cause salivation, burns of the mouth and throat and irritation of the esophagus and stomach, nausea, bloody vomiting, abdominal pain, diarrhea, risk of convulsions, loss of consciousness, deep coma and heart failure. Hypocalcemia with nervous system disorders (tetany) and cardiac arrhythmia (reduced calcium levels) may also occur. Ingestion of sodium fluoride may be fatal. Chronic ingestion of ammonium fluoride can cause dental fluorosis (discoloring of teeth) and skeletal fluorosis (adverse changes in bone structure).
- **Other Effects** - The International Agency for Research on Cancer (IARC) has not determined sodium fluoride 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 fluoride is not known to bioaccumulate or persist in the environment more than a few days. However, it can decompose in moist, acidic environments liberating hydrofluoric acid. For more ecological and environmental information concerning this product, please consult the [Material Safety Data Sheet](#).

## Physical Hazard Information

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

Exposure of sodium fluoride to strong acids, and water or high temperatures can cause decomposition. Decomposition of sodium fluoride will result in the liberation of hydrogen fluoride and possibly other hazardous products. Avoid contact with glass.

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 North America, LLC ([www.solvaynorthamerica.com](http://www.solvaynorthamerica.com))
- Solvay Chemicals, Inc. ([www.solvaychemicals.us](http://www.solvaychemicals.us))
- Solvay Chemicals Inc. Material Safety Data Sheets ([www.solvaychemicals.us/services/resourcelibrary](http://www.solvaychemicals.us/services/resourcelibrary))
- Contact Solvay Chemicals, Inc. ([www.solvaychemicals.us/feedback](http://www.solvaychemicals.us/feedback))
- NJ Department of Health & Senior Services Hazardous Substance Fact Sheets (<http://web.doh.state.nj.us/rtkhsfs/factsheets.aspx>)
- NSF International Standard 60  
[http://www.nsf.com/business/water\\_distribution/standards.asp?program=WaterDistributionSys](http://www.nsf.com/business/water_distribution/standards.asp?program=WaterDistributionSys)
- American Water Works Association  
<http://apps.awwa.org/WaterLibrary/ShowAbstract.aspx?an=0027643>
- This summary was prepared April 2010

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