

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

Chemical: Hydrofluoric acid

NFPA: H=4 F=0 I=0 S=None

HMIS: H=4 F=0 R=1 PPE= Supplied by user;
dependent on conditions

MSDS Number: HF49-0505

Effective Date: 05 May 2005

Issued by: Solvay Chemicals, Inc. Regulatory Affairs Department

Not valid three years after effective date or after issuance of superseding MSDS, whichever is earlier. French or Spanish translations of this MSDS may be available. Check www.solvaychemicals.us or call Solvay Fluorides, LLC to verify the latest version or translation availability.

Material Safety Data Sheets contain country-specific regulatory information. Therefore, the MSDS's provided are for use only by customers of Solvay Fluorides, LLC in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

1. Company and Product Identification

1.1 Product Name: Hydrofluoric acid, 49% (aqueous solution)

Chemical Name: Hydrofluoric acid

Synonyms: Fluorhydric acid, 49% HF, Aqueous HF

Chemical Formula: HF

Molecular Weight: 20

CAS Number: 7664-39-3

EINECS Number: 231-634-8

1.2 Recommended Uses: Metallurgy; Glass industry, Chemical industry, Fuel additives, Intermediates

1.3 Supplier: Solvay Fluorides, LLC
PO BOX 27328 Houston, TX 77227-7328
3333 Richmond Ave. Houston, Texas 77098

1.4 Emergency Telephone Numbers

Emergencies (USA): 1-800-424-9300 (CHEMTREC®)

Transportation Emergencies (INTERNATIONAL/MARITIME): 1-703-527-3887 (CHEMTREC®)

Transportation Emergencies (CANADA): 1-613-996-6666 (CANUTEC)

Transportation Emergencies (MEXICO-SETIQ): 01-800-00-214-00 (MEX. REPUBLIC)
525-559-1588 (Mexico City and metro area)



Responsible Care
Good Chemistry at Work

MSDS No. HF49-0505 Revised 05-05-05
Copyright 2005, Solvay Fluorides, LLC
A subsidiary of Solvay Chemicals, Inc.
All Rights Reserved.
www.solvaychemicals.us 1.800.765.8292

Solvay
Fluorides

A Subsidiary of Solvay Chemicals, Inc.



Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

2. Composition/Information on Ingredients

INGREDIENTS	FORMULA	WT. PERCENT	CAS #
Hydrogen Fluoride	HF	49	7664-39-3
Water	H ₂ O	balance	7732-18-5

3. Hazards Identification

Emergency Overview:

3.1 Route of Entry: Inhalation: Yes Skin: Yes Ingestion: Yes

3.2 Potential Effects of exposure:

- Danger! Corrosive and toxic product, very hazardous to human health and the environment.
- Causes severe burns to eyes, skin, and respiratory tract.
- Burns may not be immediately painful or visible. Onset can be delayed up to 24 hours.
- Can be absorbed through the skin in fatal amounts.
- Risk of cardiac and nervous disorders.
- Presents hazards from its ionized fluorine which binds with calcium in the body and can result in hypocalcemia (possible life-threatening lowering of serum calcium).
- Chronic exposure to the product can cause bone or dental fluorosis.
- Reactions with certain metals can generate flammable and potentially explosive hydrogen gas.

Inhalation:

- Severe irritation of the nose and the throat.
- Spasmodic cough and difficulty in breathing.
- Risk of chemical pneumonitis (lung irritation) and pulmonary edema (fluid in lungs).
- At high concentrations, risk of hypocalcemia (possible life-threatening lowering of serum calcium) with nervous problems (tetany) and cardiac arrhythmia (heart irregularity).
- In case of repeated or prolonged exposure: risk of sore throat, nosebleeds, chronic bronchitis, emphysema and erosion of teeth.

Eyes:

- Also possible hazard by simultaneous inhalation of the product.
- Burns may not be immediately painful or visible for up to 24 hours.
- Severe eye irritation, watering, redness and swelling of the eyelids.
- Burns.
- Risk of serious or permanent eye lesions or cornea damage and blindness.

Skin contact:

- Also possible hazard by simultaneous inhalation of the product.
- Burns may not be immediately painful or visible for greater than 8 hours.
- The product can be absorbed through the skin causing destruction of the deep tissue layers including the bone tissue.
- Painful irritation, redness and swelling of the skin.
- Severe burns, slow healing.
- Risk of shock.
- If contacting the fingernails, severe pain after several hours.
- Risk of hypocalcemia (possible life-threatening lowering of serum calcium) depending on the extent of the lesions.

MSDS No. HF49-0505 Revised 05-05-05
Copyright 2005, Solvay Fluorides, LLC
A subsidiary of Solvay Chemicals, Inc.
All Rights Reserved.
www.solvaychemicals.us 1.800.765.8292

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

Ingestion:

- Severe irritations, burns, perforation of the gastrointestinal tract accompanied by shock.
- Risk of edema (fluid in lungs) and suffocation.
- Nausea, vomiting (bloody), abdominal cramps and diarrhea (bloody).
- Cough and difficulty breathing.
- Risk of chemical pneumonitis (lung irritation) and pulmonary edema (fluid in lungs) from product inhalation.
- Risk of hypocalcemia (possible life-threatening lowering of serum calcium) with nervous problems (tetany) and cardiac rhythm disorders.
- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest. Risk of general symptoms having a severe or fatal prognosis.

Carcinogenicity: See section 11.3.

4. First-Aid Measures

General Recommendations:

- Consult physician immediately in all cases.
- Personal protective equipment (respirator, gloves, etc.) required for rescuers of victims (See section 8).
- In case of product splashing into eyes and face, treat eyes first.
- Decontaminate the victim first.
- Maintain an adequate supply of antidote gel (calcium gluconate).

(HANDLE PATIENT AND ALL CONTAMINATED CLOTHING WITH HF-RESISTANT GLOVES.)

Note: The effect of HF, i.e. the onset of pain, particularly in dilute solutions, may not be felt for up to 24 hours. It is important that workers have immediate access to the antidote (calcium gluconate) both on and off the worksite in order to apply it as soon as possible. Instructions should be given for the worker not to use the gel in the eye and the worker to still seek medical attention regardless of how minor the contact. The calcium combines with the fluoride to form the insoluble calcium fluoride thus preventing the fluoride from entering the intact skin and causing tissue damage. HF antidote gel (calcium gluconate) is available through Pharmascience of Montreal, Canada [(800)207-4477] and your local pharmacist.

4.1 Inhalation:

- Remove the subject from the contaminated area as soon as possible. Transport subject lying down, with the head higher than the body, to a quiet, uncontaminated and well-ventilated location.
- Administer oxygen (2.5% calcium gluconate if available, can be oxygen nebulized with trained personnel) or cardiopulmonary resuscitation if necessary and as soon as possible. If patient is unconscious, give artificial respiration. Note: Mouth to mouth resuscitation is not recommended.
- Keep warm (blanket).
- Consult physician in all cases.
- Take to a hospital.

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

Eyes:

- Flush eyes with running water for 5 minutes, while keeping the eyelids wide open.
- Rinse the eyes with a calcium gluconate 1% solution in physiological serum (10 ml of calcium gluconate 10% in 90 ml of physiological serum) for 10 minutes. (Continue a calcium gluconate drip into eyes...Then drop wise while transporting.) If 1% calcium gluconate is not available continue flushing with water.
- In the case of difficulty opening the lids, administer an analgesic eyewash. Do not use oily drops, ointment, or HF skin burn treatments.
- Consult an ophthalmologist or eye specialist and physician immediately in all cases.
- Take to a hospital immediately.

Skin:

- Immediately bring the clothed subject under the shower.
- Remove contaminated shoes, socks and clothing, while washing the affected skin with running water for 5 minutes. Double-bag all contaminated clothing for disposal.
- Immediately apply calcium gluconate gel 2.5 % and massage into the affected area using rubber gloves; continue to massage while repeatedly applying gel until 15 minutes after pain is relieved (see section 16).
- Apply water longer (15 minutes) if calcium gluconate is not available.
- Alternately, immerse the burned area in a solution of 0.2% iced aqueous Hyamine 1622 (a quaternary ammonium made by Rohm & Haas) or 0.13% iced aqueous Zephiran Chloride (a benzalkonium chloride sold by Sanofi-Synthelabo).
- If finger/fingernails are touched, even if there is no pain, dip them in a bath of 5% calcium gluconate for 15 to 20 minutes.
- Keep warm (blanket); provide clean clothing.
- Consult a physician immediately in all cases of skin contact no matter how minor.
- Take to a hospital immediately.

Ingestion:

- Consult a physician immediately in all cases.
- Take to a hospital.

If the subject is completely conscious:

- Rinse mouth with fresh water.
- Do not induce vomiting.
- When directed by physician, give orally either 1% aqueous calcium gluconate solution, milk or calcium/magnesium containing anti-acid. Such solutions can be beneficial but also may be problematic if they induce vomiting.
- If the subject presents nervous, respiratory or cardiovascular disorders, administer oxygen.

If the subject is unconscious:

- Administer classical resuscitation measures.
- Do not give anything by mouth to an unconscious person.

Hydrofluoric acid, 49% (aqueous solution) Material Safety Data Sheet

4.2 Medical Treatment/Notes to Physician: (HANDLE PATIENT AND ALL CONTAMINATED CLOTHING WITH HF-RESISTANT GLOVES.)

Note: For burns of moderate area (greater than 8 square inches on a normal adult), significant inhalation exposure, and ingestion, systemic effects may occur, and a critical care unit should be considered for the patient to monitor for hypocalcemia, cardiac arrhythmias, hypomagnesemia, and hyperkalemia and possible dialysis. Hypocalcemia may need to be monitored for burns of greater than two square inches and may require systemic administration of calcium gluconate. EKG can be monitored indirectly for effectiveness of treatment for hypocalcemia. Excess calcium can cause heart irregularities.

Inhalation:

- Pulmonary resuscitation (oxygen therapy).
- If necessary, tracheal intubation and positive pressure ventilation.
- Treat as soon as possible. Give a 2.5 to 3% calcium gluconate solution by nebulizer in the first 12 to 24 hours.
- Prevention or treatment of pulmonary edema and bacterial secondary infection.
- Surveillance of cardiac (EKG), respiratory, renal and hepatic functions.
- In case of hypocalcemia, I.V. perfusion of 10 ml of a 10% calcium gluconate solution diluted in 1 liter of physiological serum.
- Surveillance of hyperfluoremia and possible treatment with hemodialysis.
- Do not give stimulants. Patient must remain inactive for at least 24 hours.

Eye Contact:

- Initiate irrigation with 500 to 1,000 cc of a 1% calcium gluconate solution in normal saline using local anesthetic. Administration by an ocular irrigator is desirable.
- Consult an ophthalmologist.
- Follow up with 1% calcium gluconate eyedrops as required and ophthalmic steroid solution, as indicated by ophthalmologist.
- In addition, medical surveillance as specified for inhalation.

Skin Contact:

- Prevention or treatment for shock.
- Apply and massage calcium gluconate gel (2.5%) until pain subsides or 20 minutes have elapsed for 4-6 times a day
- If the exposed surface is larger than 2 in², administer (in 1,000 cc of Hartman or saline solution) 20 cc of 10% calcium gluconate at a slow rate (60-70 drops/minute).
- For second and third-degree burns, or if the pain does not subside within 20 minutes, or burns with concentrated HF (greater than 50%), consider sub-cutaneous microinjections of 2.5% calcium gluconate at a distance of 5 mm around the affected area using a small gauge needle (#30 stainless). Do not use more than 0.5 ml per cm² of affected skin surface.
- Severe digital burns: slow intra-arterial infusion (over a 4-hour period) of 10 ml of a 10% calcium gluconate solution diluted in 40 ml of physiological serum.
- For HF contact on nails, consider splitting the nail and application of calcium gluconate on the nail bed.
- Blisters and necrotic tissue should be debrided (Warning: The liquid contained in the blister is corrosive).
- Do not use local anesthetics. Resolution of pain is a means to determine effective medical treatment.
- In addition, medical surveillance as specified in "inhalation" section.

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

Ingestion:

- Oxygen therapy via intra-tracheal intubation.
- If necessary, tracheotomy.
- Careful gastric lavage after administration of 10 vials of calcium gluconate (to be repeated as frequently as needed).
- In case of intense pain, inject an I.M. morphomimetic analgesic drug (piritramide) before taking to hospital.
- Prevention or treatment of shock and pulmonary edema.
- Digestive endoscopy in all cases.
- Treatment of gastrointestinal tract burns and resulting effects.
- Surveillance and treatment of hypocalcemia. In case of hypocalcemia, I.V. perfusion of 20 ml of a 10% calcium gluconate solution diluted in 1 liter of physiological serum.
- Surveillance of hyperfluoremia and possible treatment with hemodialysis.
- Surveillance of cardiac (EKG) and nervous system functions.

5. Fire-Fighting Measures

5.1 Flash point: Not applicable.

5.2 Auto-ignition Temperature: Non-flammable.

5.3 Flammability Limits: Non-flammable.

5.4 Unusual Fire and Explosion Hazards: See section 10.

5.5 Extinguishing Methods

Common: Use means appropriate for surrounding fire.

Inappropriate extinguishing means: None.

5.6 Fire Fighting Procedures

Specific hazards:

- Non-combustible/non-flammable but may produce dangerous fumes if involved in fire.
- Formation of dangerous gas in contact with water or humid air.
- Formation of flammable gas on contact with certain metals (see section 10).

Protective measures in case of intervention:

- Evacuate all non-essential personnel.
- Intervention only by capable personnel who are trained and aware of the hazards of the product.
- In all cases wear self-contained breathing apparatus.
- When intervention in close proximity wear full protective acid-resistant suit.
- Protect intervention team with water spray when approaching the fire.
- After intervention, proceed to clean the equipment used in intervention (remove clothing carefully, double-bag contaminated clothing and dispose of properly and shower thoroughly).

Other precautions:

- Cool containers exposed to fire.
- Depending on wind direction, warn people of danger of inhalation, close doors and windows and get ventilation stopped.
- Approach from upwind.

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

- Absorb gas/vapors with water spray.
- After the fire, proceed rapidly to clean the surfaces exposed to the fumes in order to limit the damage to the equipment.
- As for any fire, ventilate and clean the rooms before reentry.

6. Accidental Release Measures

6.1 Precautions:

- Follow the protective measures given in sections 5 and 8.
- Isolate area.
- Approach from upwind.
- Ventilate the premises.
- Eliminate all sources of ignition, and do not generate flames or sparks.
- Keep away materials and products which are incompatible with the product (see section 10).
- Disperse gas/vapor with water spray.
- To avoid excessive fuming, do not apply water directly onto the spillage but upstream or on a run off.
- In case of leaking container, try to reposition it to get the leak in gaseous phase.
- Protect intervention team with water spray.
- Use bagged lime to form containment.
- If safe to do so with proper personal protective equipment, attempt to stop or minimize the leak.

6.2 Cleanup methods:

- Prevent the product from entering sewers or confined spaces.
- Knock-down water is dangerous for the environment and should be diked for containment and later disposal (see section 13).
- Neutralize product with alkali (sodium carbonate, lime,...).

6.3 Precautions for protection of the environment:

- Immediately notify the appropriate authorities in case of significant discharge.
- Do not discharge into the environment (atmosphere, ...).

7. Handling and Storage

7.1 Handling:

- Carry out industrial operations in closed, but vented, piping circuits and equipment.
- Handle small quantities under a lab hood.
- Operate in a well ventilated area.
- Use only equipment and materials which are compatible with hydrogen fluoride.
- Keep away from reactive products (see section 10).
- Preferably transfer by pump or gravity.

7.2 Storage:

- Keep in a hermetically-sealed container.
- Store in a ventilated, cool area.
- Keep away from heat sources.
- Keep away from reactive products (see section 10).
- Use containment dike around storage containers and transfer installation.

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

7.3 Specific Uses: See section 1.2.

7.4 Other precautions:

- Provide tight electrical equipment, well protected against corrosion.
- Follow the protective measures given in section 8.
- Warn people about the dangers of the product.

7.5 Packaging: Plastic material: PE.

8. Exposure Controls/Personal Protection

8.1 Exposure Limit Values:

Authorized limit Values	ACGIH®-USA (2005)	OSHA	NIOSH
Hydrogen fluoride (as F)	TWA 0.5 ppm - TLV	PEL 3 ppm	IDLH 30 ppm
	TWA 0.38 mg/m ³ - TLV	STEL 6 ppm (15min)	
	TWA 2 ppm - ceiling		
	1.5 mg/m ³ - ceiling		

AIHA Emergency Response Planning Guidelines

ERPG-1	ERPG-2	ERPG-3
2 ppm	20 ppm	50 ppm

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.

8.2 Exposure Controls:

- Maintain employee exposures to levels below the applicable exposure limits.
- Follow the protective measures given in section 7.

8.2.1 Occupational Exposure Controls:

8.2.1.1 Ventilation: Provide local ventilation suitable for appropriate emission control.

8.2.1.2 Respiratory protection:

- Use only NIOSH-approved respirators.
- Comply with OSHA respiratory protection requirements.
- Use self-contained breathing apparatus in medium confinement/in insufficient oxygen environments/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.

8.2.1.3 Hand protection:

- Use Protective gloves - HF chemically-resistant; recommended materials: butyl rubber.

8.2.1.4 Eye protection: Chemical-proof goggles/full face shield obligatory.

8.2.1.5 Skin protection:

- HF acid-resistant clothing.
- HF chemically-resistant boots if risk of splashing.

8.3 Other precautions:

- Provide shower and eyewash stations.
- Wash soiled equipment.
- Take off contaminated clothing immediately after exposure. Double-bag and dispose of properly.
- Avoid contact with any leather object.
- Consult the industrial hygienist or the safety manager for the selection of personal protective equipment suitable for the working conditions.

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

9. Physical and Chemical Properties

9.1 Appearance: Liquid.

Color: Colorless.

Odor: Pungent.

9.2 Important Health, Safety and Environmental information:

pH: <1; 10 mg HF/l: pH=3.15; 100 mg HF/l: pH = 2.65

Change of state:

Melting point: -36.1°C (-33°F).

Boiling point: 106°C (223°F) at atm.

Decomposit.on Temperature: No data.

Flash Point: Not applicable.

Flammability: Non-flammable.

Explosive Properties: With certain materials (see section 10).

Oxidizing Properties: Not applicable.

Vapor Pressure: 30.7 mbar (23 mmHg) at 20°C (68°F).

Relative Density:

Specific gravity: 1.16 at 25°C (77°F).

(H₂O=1).

Solubility:

Water: Very Soluble.

Fat: No data.

Partition coefficient: Not applicable.

Viscosity: No data.

Vapor Density (air=1): 2.4 at 20°C (68°F).

Evaporation Rate: No data.

10. Stability and Reactivity

Stability: Unstable under certain conditions (see below).

10.1 Conditions to avoid: Negligible.

10.2 Materials and substances to avoid:

- Metals: yield hydrogen gas.
- Glass: dissolves.
- Strong Bases: violent reaction.
- Alkalines: violent reaction.

10.3 Hazardous decomposition products: Hydrogen.

10.4 Hazardous Polymerization: Will not occur.

10.5 Other Information:

- Exothermic reaction when dissolved in water.
- Explosive mixtures in contact with alkaline metals (Na, K, Li,...).

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

11. Toxicological Information

11.1 Acute toxicity:

Inhalation: LC₅₀, 1 hour(s), rat, 850 to 1070 ppm.

Oral: LD₁₀₀, guinea pig, 80 mg/kg (2% solution).

Dermal: No data.

Irritation:

- Corrosive.
- Inhalation, reacts with mucous membranes.

Sensitization: No data.

Comments:

- Corrosive effect for the skin, eyes and respiratory tract.
- Chronic exposure may entail dental or skeletal fluorosis.
- Risk of effect on the liver and the kidney.
- The carcinogenic effect found in animals is not demonstrated in humans.
- Risk of toxic effect on reproductive systems.

11.2 Chronic toxicity:

- Inhalation, after prolonged exposure, rat, target organ: respiratory system/eyes/kidney, liver, observed effect (Sodium fluoride).
- Oral route, after prolonged exposure, rat/mouse, target organ: skeleton / thyroid / testes / kidney, liver, ca. 1 mg/kg. observed effect (Sodium fluoride).
- Ambiguous carcinogenic effect (Sodium fluoride).
- Fetotoxic and fertility effects (Sodium fluoride).
- Ambiguous mutagenic effect (Sodium fluoride).

11.3 Carcinogenic Designation: None

12. Ecological Information

12.1 Acute ecotoxicity:

- Fish, *Salmo gairdneri*, LC₅₀, 96 hour(s), 51 mg/l (Fluorides).
- Crustaceans, *Daphnia magna*, EC₅₀, 48 hour(s), 97 mg/l).
- Conditions: Fresh water (Fluorides).
Crustaceans, *Mysidopsis bahia*, EC₅₀, 96 hour(s), 10.5 mg/l.
- Conditions: Salt water (Fluorides).
Algae, *Scenedesmus* sp. EC₅₀, 96 hour(s), 43 mg/l (Fluorides).

12.2 Chronic ecotoxicity:

- Fish, *Salmo gardneri*, LC₅₀, 21 day(s), 3.7 mg/l (Fluorides).
- Crustaceans, *Daphnia magna*, NOEC, 21 day(s), 3.7 mg/l (Fluorides).

12.3 Mobility:

- Air - mobility in aerosol form.
- Water - considerable solubility and mobility.
- Soil/sediments - adsorption on mineral soil constituents.
- Conditions: slightly acid pH (Fluorides).

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

12.4 Degradation

Abiotic:

- Air - neutralization by natural alkalinity.
- Water/soil - ionization/neutralization of inorganic and organic materials.
- Water/soil - complexation/precipitation of inorganic materials.

Degradation products: aluminum/iron/calcium/phosphate complexes and/or precipitates as a function of pH (Fluorides).

Biotic: Not applicable (inorganic compound).

12.5 Potential for bioaccumulation:

Bioconcentration: log Po/w - not applicable (ionizable inorganic compound).

Accumulation into vegetable leaves (Fluorides).

12.6 Other adverse effects /Comments:

- Harmful for aquatic organisms.
- Nevertheless, hazard for the aquatic environment is limited due to product properties: low chronic toxicity.
- Product fate is highly dependent on environmental conditions: pH, temperature, oxidoreductive potential, mineral and organic content of the medium,...

13. Disposal Considerations

13.1 Waste treatment:

- Dispose in compliance with local, state and federal regulations.
- Contact the producer for recycling/recovery suggestions.
- Absorb the product in a KOH solution. Possible residual solution. Vapors may be released. Good ventilation is required.
- Use lime or, preferably, calcium hydroxide or calcium carbonate to precipitate the fluoride ion in the form of CaF₂.

13.2 Packaging treatment:

- To avoid treatment, use dedicated containers. Do not rinse containers.
- Dispose of the containers in compliance with local, state and federal regulations.

13.3 RCRA Hazardous Waste: Listed; RCRA Waste Number: U134.

14. Transport Information

Mode	DOT	IMDG	IATA
UN Number	UN 1790	UN 1790	UN 1790
Class	8	8	8
Proper Shipping Name	Hydrofluoric acid	Hydrofluoric acid	Hydrofluoric acid
Hazard label (Subsidiary)	Corrosive (Toxic)	Corrosive + toxic	Corrosive + toxic
Subsidiary risk	6.1	Toxic	Toxic
Placard	Corrosive (Toxic)	1790	
Subsidiary Placard	Poison		
Packing Group	II	II	II
Reportable Quantity	100 lbs.		
MFAG		750	
EmS	ERG: 157	EMS: 8-03	ERG code: 8P

MSDS No. HF49-0505 Revised 05-05-05
Copyright 2005, Solvay Fluorides, LLC
A subsidiary of Solvay Chemicals, Inc.
All Rights Reserved.
www.solvaychemicals.us 1.800.765.8292

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

15. Regulatory Information

National Regulations (US)

TSCA Inventory 8(b): Yes.

SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR 355): Yes.

SARA Title III Sec. 311/312 (40 CFR 370): Yes.

Threshold planning quantity: 100 lbs.

SARA Title III Sec. 313 Toxic Chemical Emissions Reporting (40 CFR 372): Yes.

CERCLA Hazardous Substance (40 CFR Part 302)

Listed waste: Yes; (U134) Reportable quantity-100 lbs.

Unlisted waste: Yes.

Characteristic: D002 (Corrosive).

Other: Occupational Safety and Health Administration (OSHA) requirements for process safety management must be followed anytime at least 1,000 lbs. of hydrofluoric acid is used or stored. Refer to 29CFR 1910.119 for specific details.

Environmental Protection Agency (EPA) requirements for a Risk Management Plan (RMP) must be followed anytime at least 1,000 lbs. of hydrofluoric acid > 50% is used or stored. Refer to 40CFR68.150 for specific details.

State Component Listing:

State	Comment
CA	Airborne Contaminants & Emissions Inventory
CA	Hazardous Substance List
CT	Hazardous Material Safety
IL	Chemical Safety Act
IL	Toxic Substances Disclosure to Employees Act
IN	Occupational Health & Safety Standards - Air
KY	Occupational Health & Safety Standards - Air
LA	Right to Know List
LA	Spill Reporting
MA	Oil and Hazardous Materials List
MA	Right to Know Substance List
MN	Hazardous Substance List
NJ	Right to Know Substance List
NJ	Spill Tax List
NJ	Toxic Catastrophe Prevention Act
NC	Exposure Limits for Air Contaminants
NY	Release Reporting List of Hazardous Substances
PA	Right to Know
RI	Right to Know Act

National Regulations (Canada)

Canadian DSL Registration: DSL.

Hydrofluoric acid, 49% (aqueous solution) Material Safety Data Sheet

WHMIS Classification: D1A - Very toxic material.
E - Corrosive.

This product has been classified in accordance with the hazard criteria of the **Controlled Products Regulations**, and the MSDS contains all the information required by the **Controlled Products Regulations**.

Labeling according to Directive 1999/45/EC.

Category	ID	Phrase
Symbols	T+	Very toxic.
	C	Corrosive.
Phrases R	26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
	35	Causes severe burns.
Phrases S	(1/2)	(Keep locked up and out of the reach of children.)
	7/9	Keep container tightly closed and in a well-ventilated place.
	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	36/37	Wear suitable protective clothing and gloves.
	45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. Other Information

16.1 Ratings:

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)

Health = 4 Flammability = 0 Instability = 0 Special = None

HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM)

Health = 4 Fire = 0 Reactivity = 1 PPE = Supplied by User; dependent on local conditions

16.2 Other Information:

For additional information on handling, storage and packaging see HFIPI: *Recommended Practices for the Hydrogen Fluorides Industry*. Copies can be purchased through the American Chemistry Council at (703) 741- 5611.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Fluorides, LLC 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 technically skilled persons at their own discretion and risk and does not relate to the 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, the

Hydrofluoric acid

Hydrofluoric acid, 49% (aqueous solution)

Material Safety Data Sheet

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 Chemicals, Inc. reserves the right to make additions, deletions or modifications to the information at any time without prior notification.

Trademarks and/or other Solvay Fluorides, LLC products referenced herein are either trademarks or registered trademarks of Solvay Fluorides, LLC or its affiliates, unless otherwise indicated.

16.3 Reason for revision:

Supersedes edition: Solvay Fluorides, LLC MSDS HF49-0704 dated 07/15/2004.

Purpose of revision: Update ACGIH data (section 8).