

SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product name: Hydrofluoric Acid, 49%

Product No.: 5824-06

Manufacturer:

Avantor Performance Materials, Inc.
3477 Corporate Parkway, Suite 200
Center Valley, PA 18034

Telephone:

Customer Service: 855-282-6867

Contact Person:

Emergency telephone:

24 Hour Emergency: 908-859-2151
Chemtrec: 800-424-9300

2 HAZARDS IDENTIFICATION

Emergency Overview:

Appearance:

Color: Colorless
Form : Liquid
Odor: Strong. Irritating.

Signal words DANGER!

Potential Health Effects:

General

Corrosive. Causes severe skin and eye burns. Causes digestive tract burns. May be fatal if inhaled, absorbed through skin, or swallowed. Mist or vapor extremely irritating to eyes and respiratory tract. Causes blood, cardiovascular system and respiratory system damage. Prolonged exposure may cause chronic effects. Reacts with water.

Inhalation: May be harmful if inhaled. Corrosive. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

Skin: Corrosive. Causes severe skin burns. May be fatal if absorbed through skin. Symptoms may be delayed.

Eye: Corrosive. Causes severe eye burns. Vapor or spray may cause eye damage, impaired sight or blindness.

Ingestion: Corrosive. May be fatal if swallowed. May cause burns of the gastrointestinal tract if swallowed.

Chronic Effects: Corrosive. Prolonged contact causes serious tissue damage. May cause fluorosis. Hypocalcemia and hypomagnesemia can occur from absorption of fluoride ion into the blood stream.

Routes of Exposure: Skin and/or eye contact., Inhalation, Ingestion

Target Organs: Blood, Heart, Cardiovascular system, Teeth., Bones, Endocrine system

OSHA Regulatory Status This product is hazardous according to OSHA 29CFR 1910.1200.

Environment: The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

3 COMPOSITION / INFORMATION ON INGREDIENTS

General information:

Hazardous Component(s):

Chemical name	CAS-No.	Concentration
HYDROGEN FLUORIDE	7664-39-3	45 - 55%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4 FIRST AID MEASURES

General: Immediate medical attention is required. If breathing is difficult, give oxygen. Keep victim warm. Ensure that emergency personnel are aware of the material involved, and take precautions to protect themselves.

Inhalation: Move to fresh air. Call a physician or poison control center immediately. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration.

Skin contact: Immediately remove contaminated clothing under a shower. Flush exposed areas with large quantities of water for five minutes. Wash carefully behind ears, under nails and in skin folds. Get medical attention immediately. For those providing assistance, avoid further skin contact to yourself and others. Wear HF impervious clothing with face shield or goggles and HF impervious gloves. If available, apply calcium gluconate gel (2.5%) into burn area continuously for 15 minutes or until pain relief. For a larger area, use iced Benzalkonium Chloride 0.13% soaks until pain has resolved at least 30-40 minutes. If calcium gluconate gel or Benzalkonium Chloride is not available, continue to wash exposed areas with water until patient is seen by a physician and is taken to a hospital. Insure that contaminated clothing and shoes are properly bagged and discarded. Insure that jewelry is removed and soaked in calcium gluconate solution to decontaminate.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.

Ingestion: Call a physician or poison control center immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Notes to the physician:

Treatment: Injection of 5% calcium gluconate is indicated as the primary medical treatment for large burns. If benzalkonium chloride soaks or calcium gluconate gel do not provide significant relief of pain within 30 to 40 minutes, injection of calcium gluconate solution is indicated. For burns of large skin areas (>15%), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. Calcium supplements are essential for emergency response to large exposures.

5 FIRE-FIGHTING MEASURES

Extinguishing media:	The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media:	Water may be ineffective in fighting the fire.
Unusual Fire & Explosion Hazards:	Product is acidic. Wear appropriate protective gear if spilled during fire fighting. Reacts with most metals to form flammable hydrogen gas. Fire may produce irritating, corrosive and/or toxic gases.
Special fire fighting procedures:	Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out. In case of fire and/or explosion do not breathe fumes.
Protective Measures:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment. Keep unauthorized personnel away. Keep upwind. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
Environmental precautions:	Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
Spill Cleanup Methods:	Neutralize spill area and washings with soda ash or lime. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.
Notification Procedures:	Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Inform authorities if large amounts are involved.

7 HANDLING AND STORAGE

Handling:	Use personal protective equipment as required. Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapors and spray mists. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. Never add water to acid! Always add acid to water while stirring to prevent release of heat, steam and fumes.
Storage:	Do not store in metal containers. Keep in a cool, well-ventilated place. Store in a dry place.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits

Chemical name	Type	Exposure Limit values	Source
HYDROGEN FLUORIDE - as F	TWA	0.5 ppm	US. ACGIH Threshold Limit Values (2011)
	Ceiling	2 ppm	US. ACGIH Threshold Limit Values (2011)
HYDROGEN FLUORIDE - as F	PEL	2.5 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	3 ppm	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	STEL	6 ppm	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
HYDROGEN FLUORIDE	TWA	3 ppm	US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)

Biological limit values

Chemical name	Exposure Limit values	Source
HYDROGEN FLUORIDE (fluorides: Sampling time: Prior to shift.)	2 mg/l (Urine)	ACGIH BEL (02 2012)
HYDROGEN FLUORIDE (fluorides: Sampling time: End of shift.)	3 mg/l (Urine)	ACGIH BEL (02 2012)

Protective Measures:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

Respiratory Protection:

In case of inadequate ventilation use suitable respirator. Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern.

Eye protection:

Wear safety glasses with side shields (or goggles) and a face shield.

Skin and Body Protection:

Wear suitable protective clothing.

Hygiene measures:

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Avoid contact with eyes, skin, and clothing.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical State:	Liquid
Form:	Liquid
Color:	Colorless

Odor:	Strong., Irritating.
Odor Threshold:	No data available.
pH:	1 (0.1 molar aqueous solution)
Freezing point:	-36 °C
Boiling Point:	108 °C
Flash Point:	Not applicable
Evaporation Rate:	No data available.
Flammability (solid, gas):	No data available.
Flammability Limit - Upper (%):	No data available.
Flammability Limit - Lower (%):	No data available.
Vapor pressure:	33.3 hPa
Vapor density (air=1):	No data available.
Relative density:	1.18
Solubility(ies)	
Solubility in Water:	Miscible with water.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Autoignition Temperature:	No data available.
Decomposition Temperature:	No data available.
Viscosity:	No data available.
Explosive properties:	No data available.
Oxidizing properties:	No data available.

10 STABILITY AND REACTIVITY

Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	Hazardous polymerization does not occur.
Conditions to avoid:	Heat, sparks, flames. Contact with incompatible materials.
Incompatible materials:	Strong oxidizing agents. Acids. Strong bases. Ammonia. Organic compounds. Glass. Cyanides. Fluorine. Metals. May attack some plastics, rubber and coatings.
Hazardous decomposition products:	Hydrogen fluoride.

11 TOXICOLOGICAL INFORMATION

Product:	
Acute Toxicity (Oral):	No data available.
Acute Toxicity (Inhalation):	
Name	Test results
HYDROGEN FLUORIDE	LC 50 (Rat, 1 h): 1,278 mg/l LC 50 (Mouse, 1 h): 500 mg/l
Inhalation:	May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

Ingestion:	May cause burns of the gastrointestinal tract if swallowed.
Skin corrosion/irritation:	Causes severe skin burns.
Serious eye damage/eye irritation:	Causes serious eye damage.
Respiratory sensitizer/Skin sensitizer:	Not a skin sensitizer.
Carcinogenicity:	This substance has no evidence of carcinogenic properties.
Mutagenesis:	No mutagenic components identified
Reproductive toxicity:	No components toxic to reproduction
Other effects:	None known.

12 ECOLOGICAL INFORMATION

Ecotoxicity:	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.
<u>Product:</u>	
Acute toxicity(Fish):	No data available.
Chronic Toxicity(Fish):	No data available.
Acute toxicity(Aquatic invertebrates):	No data available.
Chronic Toxicity(Aquatic invertebrates):	No data available.
Acute toxicity(Aquatic plants):	No data available.
Persistence and degradability:	Expected to be readily biodegradable.
Bioaccumulative potential:	No data available on bioaccumulation.
Mobility:	The product is water soluble and may spread in water systems.

13 DISPOSAL CONSIDERATIONS

Disposal methods:	Discharge, treatment, or disposal may be subject to national, state, or local laws.
Uncleaned Empty Packaging:	Since emptied containers retain product residue, follow label warnings even after container is emptied.

14 TRANSPORT INFORMATION

DOT

UN number:	UN 1790
Proper Shipping Name:	Hydrofluoric acid
Transport hazard class(es):	8, 6.1
Subsidiary risk label:	—
Packing group:	II
Label(s):	8, 6.1
Marine Pollutant	Not Regulated

IMDG - International Maritime Dangerous Goods Code

UN number:	UN 1790
UN proper shipping name:	HYDROFLUORIC ACID
Transport hazard class(es):	8, 6.1
Subsidiary risk label:	—
Packing group:	II
Label(s):	8, 6.1
Marine Pollutant:	Not Regulated
EmS No.:	F-A; S-B

IATA

UN number:	UN 1790
Proper Shipping Name:	Hydrofluoric acid
Transport hazard class(es):	8, 6.1
Subsidiary risk label:	—
Packing group:	II
Label(s):	8, 6.1

15 REGULATORY INFORMATION

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EU EINECS List:	On or in compliance with the inventory
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	On or in compliance with the inventory
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Switzerland Consolidated Inventory:	Not in compliance with the inventory.
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

US Regulations

• CERCLA Hazardous Substance List (40 CFR 302.4):

• Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3):

HYDROGEN FLUORIDE	Reportable quantity: 100 lbs.
-------------------	-------------------------------

• Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

HYDROGEN FLUORIDE	Threshold quantity: 1000 lbs
-------------------	------------------------------

SARA Title III

• Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Chemical name	RQ	Threshold Planning Quantity
HYDROGEN FLUORIDE	100 lbs.	100 lbs.

• Section 311/312 (40 CFR 370):

☒ Acute (Immediate)
 ☒ Chronic (Delayed)
 ☐ Fire
 ☐ Reactive
 ☐ Pressure Generating

• Section 313 Toxic Release Inventory (40 CFR 372):

Chemical name	CAS-No.	Reporting threshold for other users	Reporting threshold for manufacturing and processing
HYDROGEN FLUORIDE	7664-39-3	10000 lbs	25000 lbs.

State Regulations

• California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

No ingredient regulated by CA Prop 65 present.

• Massachusetts Right-To-Know List:

HYDROGEN FLUORIDE Listed

• New Jersey Right-To-Know List:

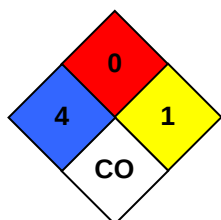
WATER Listed
 HYDROGEN FLUORIDE Listed

• Pennsylvania Right-To-Know List:

WATER Listed
 HYDROGEN FLUORIDE Listed

16 OTHER INFORMATION

NFPA Hazard ID



Flammability
 Health
 Reactivity
 Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
 COR: Corrosive

Revision Information:

Issue date: 10-01-2013

SDS No.:

Disclaimer:

THE INFORMATION PRESENTED IN THIS MATERIAL SAFETY DATA SHEET (MSDS/SDS) WAS PREPARED BY TECHNICAL PERSONNEL BASED ON DATA THAT THEY BELIEVE IN THEIR GOOD FAITH JUDGMENT IS ACCURATE. HOWEVER, THE INFORMATION PROVIDED HEREIN IS PROVIDED "AS IS," AND AVANTOR PERFORMANCE MATERIALS MAKES AND GIVES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, AND EXPRESSLY DISCLAIMS ALL WARRANTIES REGARDING SUCH INFORMATION AND THE PRODUCT TO WHICH IT RELATES, WHETHER EXPRESS, IMPLIED, OR

STATUTORY, INCLUDING WITHOUT LIMITATION, WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY, STABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. THIS MSDS/SDS IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PROPERLY TRAINED PERSON USING THIS PRODUCT, AND IS NOT INTENDED TO BE COMPREHENSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING, STORAGE, OR DISPOSAL OF THE PRODUCT. INDIVIDUALS RECEIVING THIS MSDS/SDS MUST ALWAYS EXERCISE THEIR OWN INDEPENDENT JUDGMENT IN DETERMINING THE APPROPRIATENESS OF SUCH ISSUES. ACCORDINGLY, AVANTOR PERFORMANCE MATERIALS ASSUMES NO LIABILITY WHATSOEVER FOR THE USE OF OR RELIANCE UPON THIS INFORMATION. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS, A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR TO VIOLATE ANY FEDERAL, STATE, LOCAL, OR FOREIGN LAWS. AVANTOR PERFORMANCE MATERIALS REMINDS YOU THAT IT IS YOUR LEGAL DUTY TO MAKE ALL INFORMATION IN THIS MSDS/SDS AVAILABLE TO YOUR EMPLOYEES.