

Distributed By:
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SAFETY DATA SHEET
North American Version

HYDROFLUORIC ACID 49%

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or preparation

Product name : HYDROFLUORIC ACID 49%
Molecular Weight : 20 g/mol

1.2. Use of the Substance/Preparation

Recommended use : - Chemical industry
- Glass industry
- Metallurgy
- Fuel additive
- Chemical intermediate

1.3. Company/Undertaking Identification

Address : SOLVAY FLUORIDES, LLC
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone : 1 (800) 424-9300 CHEMTREC® (USA & Canada)
01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number : US: +1-713-525-6500 (Product information)
(product information): US: +1-800-765-8292 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 4 F= 0 I= 1 S= none
HMIS : H= 4 F= 0 R= 1 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : liquid
Colour : colourless
Odour : pungent

Main effects

- Very toxic by inhalation, in contact with skin and if swallowed.
- Causes severe burns.
- Hazardous decomposition products formed under fire conditions.

2.2. Potential Health Effects:

Inhalation

- Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough.
- Breathing difficulties
- Aspiration may cause pulmonary oedema and pneumonitis.
- At high concentrations, risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia.
- Repeated or prolonged exposure: sore throat, Nose bleeding, chronic bronchitis.

Eye contact

- May cause permanent eye injury.
- May cause blindness.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Burn, Lachrymation, Redness, Swelling of tissue.

Skin contact

- Causes severe burns.
- Risk of shock.
- In case of contact with fingernails, severe pain after several hours.
- Risk of hypocalcemia following the extend of the lesions.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Irritation, Redness, Swelling of tissue.

Ingestion

- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.
- Risk of throat (o)edema and suffocation.
- Risk of chemical pneumonitis from product inhalation.
- risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia
- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest.
- Symptoms: Nausea, Bloody vomiting, Abdominal pain, Diarrhoea, Cough, Severe shortness of breath.

Other toxicity effects

- See section 11: Toxicological Information

2.3. Environmental Effects:

- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen fluoride

CAS-No. : 7664-39-3
Concentration : **appr. 49.0 %**

4. FIRST AID MEASURES

4.1. Inhalation

- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.
- Take victim immediately to hospital.

4.2. Eye contact

- Immediate medical attention is required.
- Take victim immediately to hospital.
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- Rinse the eyes with a calcium gluconate 1% solution in physiological serum (10 ml of calcium gluconate 10% in 90 ml of physiological serum)

- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).

4.3. Skin contact

- Call a physician immediately.
- Take victim immediately to hospital.
- Take off contaminated clothing and shoes immediately.
- Wash off with plenty of water.
- 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.
- If fingers/finger nails are touched, even if there is no pain, dip them in a bath of 5% calcium gluconate for 15 to 20 minutes.
- Keep warm and in a quiet place.

4.4. Ingestion

- Call a physician immediately.
- Take victim immediately to hospital.

If victim is conscious:

- If swallowed, rinse mouth with water (only if the person is conscious).
- Give to drink a 1% aqueous calcium gluconate solution.
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

If victim is unconscious but breathing:

- Oxygen or artificial respiration if needed.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- Water may be ineffective.

5.3. Special exposure hazards in a fire

- The product is not flammable.
- Not combustible.
- Heating can release hazardous gases.
- Gives off hydrogen by reaction with metals.
- Contact with water may produce heat release and presents risks of splashing.

5.4. Hazardous decomposition products

- Hydrogen

5.5. Special protective equipment for fire-fighters

- Wear self-contained breathing apparatus and protective suit.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear chemical resistant oversuit
- Protect intervention team with a water spray as they approach the fire.

5.6. Other information

- Cool containers / tanks with water spray.
- Keep from any possible contact with water.
- Approach from upwind.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- After the fire, proceed rapidly with cleaning of surfaces exposed to the fumes in order to limit equipment damage.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

- Refer to protective measures listed in sections 7 and 8.
- Approach from upwind.
- Isolate the area.
- Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- Avoid spraying the leak source.
- Protect intervention team with a water spray as they approach the fire.

6.2. Environmental precautions

- If the product contaminates rivers and lakes or drains inform respective authorities.
- Do not flush into surface water or sanitary sewer system.

6.3. Methods for cleaning up

- Prevent product from entering drains.
- Dilute with water.
- Contact with water may produce heat release and presents risks of splashing.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

7.1. Handling

- Clean and dry piping circuits and equipment before any operations.
- Keep away from water.
- Used in closed system
- Handle small quantities under a lab hood.
- Use only in well-ventilated areas.
- Use only equipment and materials which are compatible with the product.
- Keep away from Incompatible products.
- Preferably transfer by pump or gravity.
- For further information, please contact:
- Manufacturer, importer, supplier

7.2. Storage

- Keep container tightly closed.
- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from Incompatible products.
- Prevent spreading over a wide area (e.g. by containment or oil barriers).
- Information about special precautions needed for bulk handling is available on request.

7.3. Packaging material

- Plastic drum
- Polyethylene

7.4. Other information

- Provide tight electrical equipment well protected against corrosion.
- For personal protection see section 8.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Hydrogen fluoride

- PEL (OSHA / USA)
TWA = 3 ppm
- US. ACGIH Threshold Limit Values 2007
time weighted average = 0.5 ppm
Remarks: as F
- US. ACGIH Threshold Limit Values 2007
Ceiling Limit Value = 2 ppm
Remarks: as F
- US. OSHA Table Z-2 (29 CFR 1910.1000) 02 2006
time weighted average = 3 ppm
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
Permissible exposure limit = 2.5 mg/m³
Remarks: as F
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
time weighted average = 3 ppm
Remarks: as F
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
Short term exposure limit = 6 ppm
Remarks: as F
- US. ACGIH Threshold Limit Values 2008
Remarks: as F, Can be absorbed through skin.
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
time weighted average = 3 ppm
Remarks: as F
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
Short term exposure limit = 6 ppm
Remarks: as F

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

SAEL = Solvay Acceptable Exposure Limit, Time Weighted Average for 8 hour workdays. No Specific TLV STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV TWA.

8.2. Engineering controls

- Provide appropriate exhaust ventilation at machinery.
- Apply technical measures to comply with the occupational exposure limits.
- Refer to protective measures listed in sections 7 and 8.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- In the case of dust or aerosol formation use respirator with an approved filter.
- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

8.3.2. Hand protection

- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Protective gloves - impervious chemical resistant:
- Suitable material: butyl-rubber

8.3.3. Eye protection

- Face-shield
- Chemical resistant goggles must be worn.

8.3.4. Skin and body protection

- impervious clothing
- Apron/boots of butyl rubber if risk of splashing.
- Do not wear leather shoes.

8.3.5. Hygiene measures

- Use only in an area equipped with a safety shower.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- May not get in touch with:
 - Leather
- Handle in accordance with good industrial hygiene and safety practice.
- Consult the industrial hygienist or the safety manager for the selection of personal protective equipment suitable for the working conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

Appearance	: liquid
Colour	: colourless
Odour	: pungent

9.2. Important health safety and environmental information

pH	: < 1
Boiling point/boiling range	: 106 °C (223 °F)
Flash point	: <i>Remarks: not applicable</i>
Flammability	: <i>Remarks: The product is not flammable.</i>
Explosive properties	: <u><i>Explosion danger:</i></u> <i>Remarks: With certain materials (see section 10).</i>
Oxidizing properties	: <i>Remarks: not applicable</i>
Vapour pressure	: 30.7 mbar <i>Temperature: 20 °C (68 °F)</i>
Relative density / Density	: 1.16 <i>Temperature: 25 °C (77 °F)</i>
Solubility	: Water <i>Remarks: completely miscible, Reacts violently with water.</i>
Partition coefficient: n-octanol/water	: <i>Remarks: not applicable</i>
Vapour density	: 2.4 <i>Temperature: 20 °C (68 °F)</i>

9.3. Other data

Freezing point: : -36.1 °C (-33.0 °F)

10. STABILITY AND REACTIVITY

10.1. Stability

- Stable under recommended storage conditions.
- Reacts violently with water.
- Corrosive in contact with metals
- Gives off hydrogen by reaction with metals.
- Risk of violent reaction.
- Risk of explosion.

10.2. Conditions to avoid

- Exposure to moisture.

10.3. Materials to avoid

- Water, glass, Metals, Strong bases, Alkali metals

10.4. Hazardous decomposition products

- Hydrogen

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity

- LD 100, guinea pig, 80 mg/kg (2 % solution)

Acute inhalation toxicity

- LC50, 1 h, rat, 850 - 1,070 mg/m³

Irritation (other route)

- Corrosive

Chronic toxicity

- Inhalation, Prolonged exposure, rat, Target Organs: Respiratory system, Kidney, Liver, testes, observed effect, (gas)
- Inhalation, Prolonged exposure, rat, Target Organs: cardio-vascular system, nervous system, observed effect, (gas)

Remarks

- corrosive effects
- Liver and kidney injuries may occur.
- Chronic exposure may entail dental or skeletal fluorosis
- The carcinogenic effect is not demonstrated in human
- risk of effect to:
- toxic effects for reproduction

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Fishes, *Salmo gairdneri*, LC50, 96 h, 51 mg/l (Fluorides)
 - Crustaceans, *Mysidopsis*, EC50, 96 h, 10.5 mg/l (Fluorides)
- Remarks: salt water

- Crustaceans, Daphnia magna, EC50, 48 h, 97 mg/l (Fluorides)
Remarks: fresh water

Chronic toxicity

- Fishes, Salmo gairdneri, LC50, 21 Days, 2.7 - 4.7 mg/l (Fluorides)
- Crustaceans, Daphnia magna, NOEC, 21 Days, 3.7 mg/l (Fluorides)
- Algae, Scenedesmus sp., EC50, 96 h, 43 mg/l (Fluorides)

12.2. Mobility

- Air
Remarks: mobility as solid aerosols
- Water, Solubility, Mobility
- Soil/sediments, (fluoride)
Conditions: pH
Remarks: potential adsorption

12.3. Persistence and degradability

Abiotic degradation

- Air
Result: neutralization by natural alkalinity
- Water, Soil
Result: ionization/neutralization
- Water, Soil
Result: complexation/precipitation of inorganic materials

Biodegradation

- Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

12.4. Bioaccumulative potential

- Bioaccumulative potential: log Pow
Result: not applicable
- (Fluorides)
Result: accumulation into vegetable leaves

12.5. Other adverse effects

- no data available

12.6. Remarks

- No data is available on the product itself.
- Ecological data therefore refers only to the effects of the decomposition products.
- Harmful to aquatic organisms.
- Nevertheless, hazard for the environment is limited due to product properties:
- . low chronic toxicity.
- Product fate is highly dependent on environmental conditions: pH, temperature, redox potential, mineral and organic content of the medium,...

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- or

13.2. Packaging treatment

- Clean container with water.
- The empty and clean containers are to be reused in conformity with regulations.
- To avoid treatments, as far as possible, use dedicated containers.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - Yes
- Unlisted RCRA Hazardous Waste (40 CFR 302) - Yes
- D002 (corrosive waste)

14. TRANSPORT INFORMATION

UN-Number	1790
IATA-DGR	
Class	8
Sub-risks	Toxic
Packing group	II
ICAO-Labels	CORROSIVE + TOXIC
Proper shipping name: HYDROFLUORIC ACID	
IMDG	
Class	8
Sub-risks	toxic
Packing group	II
ICAO-Labels	CORROSIVE + TOXIC
HI/UN No.	1790
U.S. Dept of Transportation	
Class (Subsidiary)	8 (6.1)
Packing group	II
Label (Subsidiary)	Corrosive (toxic)
U.S. Dept of Transportation	
Class (Subsidiary)	6.1
Label (Subsidiary)	toxic
Marine pollutant:	no
Emergency info:	ERG: 157
Proper shipping name: HYDROFLUORIC ACID	
Canada (TDG)	
Class (Subsidiary)	8 (6.1)
Packing group	II
Label (Subsidiary)	Corrosive (Toxic)
Marine pollutant:	no
Emergency info:	ERG: 157
Proper shipping name: HYDROFLUORIC ACID	

15. REGULATORY INFORMATION

15.1. Inventory Information

Australian Inventory of Chemical Substances (AICS) : - In compliance with inventory.

Canadian Domestic Substances List (DSL)	:	-	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	:	-	In compliance with inventory.
Japan (ENCS) List (ENCS (JP))	:	-	In compliance with inventory.
New Zealand Interim Inventory of Chems. (NZ CLSC)	:	-	In compliance with inventory.
Toxic Substance Control Act list (TSCA)	:	-	In compliance with inventory.
EU list of existing chemical substances (EINECS)	:	-	In compliance with inventory.
Korea Existing Chemicals Inv. (KECI) (KECI (KR))	:	-	In compliance with inventory.
Philippines PICCS (PICCS (PH))	:	-	In compliance with inventory.

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- yes.

SARA Hazard Designation (SARA 311/312)

- Acute Health Hazard: Yes.
- Chronic Health Hazard: Yes.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- yes.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- This product is reportable under 40 CFR Part 302.4 because it contains the following substance(s):.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

- yes.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- yes.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- not regulated.

15.3. Classification and labelling

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

- D1A Very Toxic Material Causing Immediate and Serious Toxic Effects
- E Corrosive Material

Remarks: 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.

EC Label

- Hazardous components which must be listed on the label: Hydrogen fluoride
- The product is classified and labelled in accordance with Directive 1999/45/EC.

Symbol(s)	T+ C	Very toxic Corrosive
R-phrase(s)	R26/27/28 R35	Very toxic by inhalation, in contact with skin and if swallowed. Causes severe burns.
S-phrase(s)	S 1/2 S 7/9 S26 S36/37 S45	Keep locked up and out of the reach of children. Keep container tightly closed and in a well-ventilated place. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)

Health = 4 Flammability = 0 Instability = 1 Special =none

HMIS (Hazardous Material Information System)

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

Further information

- HF-Antidote Gel from IPS Healthcare is recommended as treatment for injuries from hydrofluoric acid.
- Update
This data sheet contains changes from the previous version in section(s): 1.2
- Distribute new edition to clients
- Environmental Protection Agency (EPA) requirements for a Risk Management Plan must be followed anytime at least 1000 lbs. of Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater) are used or stored. Refer to 40 CFR 68.150 for specific details.
- Occupational Safety and Health Administration (OSHA) requirements for process safety management must be followed anytime at least 1000 lbs. of Hydrogen Fluoride are used or stored. Refer to 29 CFR 1910.119 for specific details.

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 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. 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 the company mentioned in section 1 nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, 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 in compliance with

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