

SAFETY DATA SHEET
North American Version

HYDROFLUORIC ACID 70 % (AQUEOUS SOLUTION)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name : HYDROFLUORIC ACID 70 % (AQUEOUS SOLUTION)
Chemical Name : Hydrofluoric acid
Molecular formula : HF
Molecular Weight : 20 g/mol

1.2. Use of the Substance/Mixture

Recommended use : - Metallurgy
- Glass industry
- Chemical industry
- Fuel additive
- Chemical intermediate
Recommended use : - For further information, please contact: Supplier

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

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

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 4 F= 0 I= 1 S= None
HMIS : H= 3 F= 0 R= 1 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : liquid
Colour : colourless
Odour : pungent

Main effects

- Chronic exposure may entail dental or skeletal fluorosis

2.2. Potential Health Effects:

Inhalation

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

Eye contact

- May cause permanent eye injury.
- May cause blindness.
- Symptoms: Lachrymation, Redness, Swelling of tissue, Burn.

Skin contact

- Causes severe burns.
- Risk of shock.
- Risk of hypocalcemia following the extent of the lesions.
- Symptoms: Irritation, Redness, Swelling of tissue, Burn.

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. 70.0 %

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

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.
- First treatment with calcium gluconate paste.
- Rinse with lukewarm running water.
- Please make sure that hospital staff is aware of the unique characteristics of injuries caused by HF exposures and the fact that the systemic toxic effects of the exposure will require prompt serum monitoring of fluorides, calcium, magnesium and sodium, and calcium replacement by infusion.

4.4. Ingestion

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

If victim is conscious:

- Rinse mouth with water.
- Give to drink a 1% aqueous calcium gluconate solution.
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

4.5. Notes to physician

Exposure to decomposition products :

- Take victim immediately to hospital.
- Immediate medical attention is required.
- If skin irritation occurs:
- 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.
- HF-Antidote Gel from IPS Healthcare is recommended as treatment for injuries from hydrofluoric acid.
- Please make sure that hospital staff is aware of the unique characteristics of injuries caused by HF exposures and the fact that the systemic toxic effects of the exposure will require prompt serum monitoring of fluorides, calcium, magnesium and sodium, and calcium replacement by infusion.

5. FIREFIGHTING 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.
- Hazardous decomposition products formed under fire conditions.
- Gives off hydrogen by reaction with metals.

5.4. Hazardous decomposition products

- Hydrogen

5.5. Special protective equipment for firefighters

- Wear self-contained breathing apparatus and protective suit.
- Wear chemical resistant oversuit
- Special protective actions for fire-fighters
- In case of fire, use water spray.
- Keep product and empty container away from heat and sources of ignition.
- Cool containers / tanks with water spray.
- Keep from any possible contact with water.

- Approach from upwind.

5.6. Other information

- Suppress (knock down) gases/vapours/mists with a water spray jet.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.

6.1.2. Advice for emergency responders

- Immediately evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.
- Wear self-contained breathing apparatus and protective suit.
- Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- Avoid spraying the leak source.
- Ventilate the area.

6.2. Environmental precautions

- Discharge into the environment must be avoided.
- If the product contaminates rivers and lakes or drains inform respective authorities.
- Prevent product from entering drains.

6.3. Methods and materials for containment and cleaning up

- Prevent product from entering drains.
- When diluting, always add the product to water. Never add water to the product.
- Neutralize with lime milk or soda and flush with plenty of water.
- Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE

7.1. Handling

- Use only in well-ventilated areas.
- Used in closed system
- Use only clean and dry utensils.
- Keep away from water.
- Preferably transfer by pump or gravity.
- Keep away from Incompatible products.

7.2. Storage

- Keep container tightly closed.
- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from Incompatible products.
- Keep in a bunded area.
- Electrical equipment should be protected to the appropriate standard.

7.3. Packaging material

- Steel drum
- Steel coated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Hydrogen fluoride

- PEL (OSHA / USA)
TWA = 3 ppm
- US. ACGIH Threshold Limit Values 12 2010
time weighted average = 0.5 ppm
- US. ACGIH Threshold Limit Values 12 2010
Ceiling Limit Value = 2 ppm
- 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 12 2010
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.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- In the case of dust or aerosol formation use respirator with an approved filter.
- Respirator with a full face mask
- In case of decomposition (see section 10), face mask with combined type B-P3 cartridge.
- 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.
- Recommended Filter type:: E-P3

8.3.2. Hand protection

- Heat insulating gloves
- Impervious gloves

- 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).
- Suitable material: Fluoroelastomer

8.3.3. Eye protection

- Chemical resistant goggles must be worn.
- If splashes are likely to occur, wear: Face-shield

8.3.4. Skin and body protection

- Complete suit protecting against chemicals
- Boots
- Do not wear leather shoes.

8.3.5. Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- May not get in touch with:
 - Leather
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

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	: 60 °C (140 °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	: from 14 - 470 mbar <i>Temperature: 20 °C (68 °F)</i>
Relative density / Density	: from 1.23
Bulk density	: <i>Remarks: not applicable</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: : -100 °C (-148 °F)
Auto-flammability : *Remarks:* not applicable

10. STABILITY AND REACTIVITY

10.1. Stability

- Stable under recommended storage conditions.

10.2. Conditions to avoid

- Exposure to moisture.

10.3. Materials to avoid

- Water, glass, Metals, Strong bases, Alkali metals
- 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, 2240 - 2340 ppm (gas)

Acute dermal irritation/corrosion

- 1 min, rabbit, 2 %(m), *Remarks:* NOEC (solution)
- 30 min, rabbit, 0.01 %(m), *Remarks:* NOEC (solution)

Irritation (other route)

- Corrosive

Sensitisation

- Did not cause sensitization. (Sodium fluoride)

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)

Carcinogenicity

- Limited evidence of carcinogenicity in animal studies, (Sodium fluoride)

Reproductive toxicity

- rat, 10 - 14 mg/kg, NOAEL, (Sodium fluoride)

Remarks

- no data available
- In vitro tests did not show mutagenic effects, In vivo tests did not show mutagenic effects, (Sodium fluoride)

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Fishes, *Salmo gairdneri*, LC50, 96 h, 51 mg/l (Sodium fluoride)
Remarks: fresh water, static test
- Crustaceans, *Daphnia magna*, EC50, 96 h, 10.5 mg/l (Sodium fluoride)
Remarks: salt water
- Crustaceans, *Daphnia magna*, EC50, 48 h, 26 mg/l (Sodium fluoride)
Remarks: fresh water

Chronic toxicity

- Fishes, *Oncorhynchus mykiss*, NOEC, 21 Days, 4 mg/l (Sodium fluoride)
Remarks: fresh water, static test
- Crustaceans, *Daphnia magna*, NOEC, 21 Days, 8.9 mg/l (Sodium fluoride)
Remarks: static test, fresh water
- Algae, various species, EC50, 96 h, 43 mg/l (Sodium fluoride)
Remarks: fresh water
- Algae, various species, EC50, 81 mg/l (Sodium fluoride)
Remarks: Marine water
- Algae, various species, NOEC, 7 d, 50 mg/l (Sodium fluoride)
Remarks: fresh water, static test
- Algae, various species, NOEC, 7 d, 50 mg/l (Sodium fluoride)
Remarks: Marine water, static test

12.2. Mobility

- Air
Remarks: mobility as solid aerosols
- Water, Solubility(ies), 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

- Remarks: Does not bioaccumulate.

12.5. Other adverse effects

- no data available

12.6. Remarks

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.
- Dilute with plenty of water.

- Can be eliminated from water by precipitation.
- Filtrate the product and send the cake to a landfill for industrial waste.
- Discharge liquid filtrate to a wastewater treatment system

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

IATA-DGR

UN number	UN 1790
Class	8
Packing group	I
ICAO-Labels	8 - Corrosive 6.1 - Toxic

Proper shipping name: HYDROFLUORIC ACID

IMDG

UN number	UN 1790
Class	8
Packing group	I
IMDG-Labels	8 - Corrosive 6.1 - Toxic

EmS
F-A
S-B

Proper shipping name: HYDROFLUORIC ACID

U.S. Dept of Transportation

UN number	UN 1790
Class	8
Packing group	I
Label	8 - Corrosive 6.1 - Toxic

EmS
157
Reportable Quantity
45.4 kg

Proper shipping name: HYDROFLUORIC ACID

Canada (TDG)

UN number	UN 1790
Class	8
Packing group	I
Label	8 - Corrosive 6.1 - Toxic

EmS 157
Proper shipping name: HYDROFLUORIC ACID

15. REGULATORY INFORMATION

15.1. Inventory Information

Toxic Substance Control Act list (TSCA)	: -	In compliance with inventory.
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.
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	: -	In compliance with inventory.
Korean Existing Chemicals List (ECL)	: -	In compliance with inventory.
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	: -	In compliance with inventory.
New Zealand Inventory of Chemicals (NZIOC)	: -	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.
- Reactivity 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.

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)

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

HMIS (Hazardous Material Information System)

Health = 3 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): 8.1.2.1, 8.1.2.2

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).

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