SDS

Safety Data Sheet

1. IDENTIFICATION

Product Identifier: **Hydrofluoric Acid, 48-51% w/w**

Product Code(s): CF1043, H1023, H1059

Synonyms: Concentrated Hydrofluoric Acid; Fluorhydric Acid; Fluoric Acid; Hydrogen Fluoride Solution; Fluorine Hydride Aqueous.

Recommended Use: For manufacturing, industrial, and laboratory use only. Use as a catalyst or as a laboratory reagent.

Uses Advised Against: Not for food, drug, or household use.

Supplier: Rocky Mountain Reagents, Inc.
4621 Technology Drive, Golden, CO 80403
Phone: (303) 762-0800 Fax: (303) 762-1240

Emergency Phone Number: (800) 255-3924 (CHEM-TEL)

2. HAZARDS IDENTIFICATION

Hazard Classifications:

Acute Toxicity – Oral:	Category 2
Acute Toxicity – Dermal:	Category 1
Acute Toxicity – Inhalation:	Category 2
Skin Corrosion/Irritation:	Category 1A
Eye Damage/ Irritation:	Category 1
Specific Target Organ Toxicity (Single Exposure):	Category 1
Specific Target Organ Toxicity (Repeated Exposure):	Category 1
Corrosive to Metals	Category 1

Signal Word: DANGER

Hazard Statements:
Fatal if swallowed.
Fatal in contact with skin.
Fatal if inhaled.
Causes severe skin burns and eye damage.
Causes serious eye damage.
Causes damage to organs.
Causes damage to organs through prolonged or repeated exposure.
May be corrosive to metals.

Pictograms:

Precautionary Statements:

Prevention:

Wash thoroughly after handling.
Do not eat, drink, or smoke when using this product.
Do not get in eyes, on skin, or on clothing.
Wear protective gloves, protective clothing, eye protection, and face protection.
Do not breathe fumes, mists, vapors, or spray.
Use only outdoors or in a well-ventilated area.
In case of inadequate ventilation, wear respiratory protection.
Keep only in original container.

Response:

If exposed or concerned: Immediately call a poison center or doctor.
If swallowed: Rinse mouth. Do NOT induce vomiting. Give milk or 10% calcium gluconate by mouth (calcium carbonate or an antacid containing calcium or magnesium carbonate or hydroxide may also be used).
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Apply 2.5% calcium gluconate gel to the burn area. Burns covering more than 8 square inches require immediate treatment by a medical doctor. Wash contaminated clothing before reuse.
If inhaled: Remove person to fresh air and keep comfortable for breathing. A 2.5% calcium gluconate solution can be given by nebulizer. If not breathing, give artificial respiration using a pocket mask with a one-way valve.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. A 1% calcium gluconate gel solution can be used to irrigate the eye using a syringe or a continuous irrigation device.
Absorb spillage to prevent material damage.

Storage:

Store locked up.
Store in a well ventilated place. Keep container tightly closed.
Store in corrosive resistant container with a resistant inner liner.

Disposal:

Dispose of contents and container in accordance with local, regional, national, and international regulations.

Hazards Not Otherwise Classified:

Not applicable.

Toxicity Statement:

Not applicable.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Component	Common Name / Synonyms	CAS#	Chemical Formula	% by Weight
Hydrogen Fluoride	Hydrofluoric Acid	7664-39-3	HF	48.0 – 51.0
Water	Water	7732-18-5	H_2O	49.0 – 52.0

Trade Secret Statement:

Not applicable.

4. FIRST AID MEASURES

First Aid Procedures:

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. A 2.5% calcium gluconate solution can be given by nebulizer. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious, or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. Call a physician immediately.

Ingestion: Do NOT induce vomiting. If vomiting occurs, keep head low so that vomit does not enter lungs. Give milk or 10% calcium gluconate by mouth (calcium carbonate or an antacid containing calcium or magnesium carbonate or hydroxide may also be used). Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or poison control center immediately.

Skin Contact: Wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Apply 2.5% calcium gluconate gel to the burn area. Wash clothing before reuse. Immediate medical attention is required. Call a physician immediately.

Eye Contact: Check for and remove contact lenses, if present and easy to do. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. A 1% calcium gluconate gel solution can be used to irrigate the eye using a syringe or a continuous irrigation device. Immediate medical attention is required. Call a physician immediately.

General Advice: Poison information centers in each state can provide additional assistance for scheduled poisons. Ensure that those providing first aid and medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Symptoms and Effects: Inhalation may cause coughing, sore throat, difficulty breathing, and lung inflammation. Ingestion may cause sore throat, abdominal pain, diarrhea, vomiting, and gastrointestinal burns. Skin contact may cause burns. Eye contact may cause blurred vision and eye damage. Prolonged or repeated exposure may cause fluorosis of bones and joints, hypocalcemia, and hypomagnesemia. Prolonged or repeated exposure may affect the liver, respiratory system, kidneys, central nervous system, and skin.

Immediate Medical Care/ Special Treatment: Immediate medical attention is required. Call a physician or poison center immediately. Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media: Water spray, dry powder, alcohol resistant foam, carbon dioxide.

Unsuitable Extinguishing Media: Do not use dry sand. Do not use a solid (straight) water stream, as it may scatter and spread fire.

Hazardous Combustion Products: Hydrogen fluoride, hydrogen.

Specific Hazards: Contact with metals may produce hydrogen gas. May emit corrosive and/or toxic fumes when heated.

Special Protective Equipment/ Precautions for Firefighters: As in any fire, wear MSHA/NIOSH approved (or equivalent), self-contained, positive-pressure or pressure-demand breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment: Ventilate area of leak or spill. Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Wear appropriate personal protective equipment (see Section 8). Avoid contact with eyes, skin, and clothing.

Emergency Procedures: Evacuate surrounding personnel. In case of chemical emergency, or if unsure how to address an accidental release, consult a professional (see Section 1).

Methods for Containment: Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements, or confined areas. Dike the spilled material, where this is possible. Product should not be released to the environment. Contain and recover liquid in compatible containers (see Section 10) when possible.

Methods for Cleanup: Absorb spill with a compatible material (see Section 10) and place in a non-combustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Residues from spills can be neutralized with alkaline material such as soda ash or lime. Never return spills in original containers for reuse. Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling: Wear personal protective equipment (see Section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist. Do not ingest. When using, do not eat, drink, or smoke. Keep away from incompatible materials (see Section 10). Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty, as they retain product residues. Observe all warnings and precautions listed for this product. As with all acids, never add water directly to this product. Instead, add acids to water to prevent violent eruption of the solution.

Storage: Store in a cool, dry, ventilated area. Store in a segregated and approved area away from heat and incompatible materials (see Section 10). Store in original container. Do not store in metallic containers. Keep containers tightly closed and upright. Keep away from food, drink, and animal foodstuffs. Keep out of the reach of children. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of this product.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Hydrogen Fluoride:	OSHA PEL:	TWA:	3 ppm 2.5 mg/m^3
		STEL:	6 ppm
	ACGIH TLV:	TWA:	0.5 ppm 2.5 mg/m^3
	NIOSH:	IDLH:	30 ppm 250 mg/m^3
		TWA:	3 ppm 2.5 mg/m^3

Engineering Controls: Ensure adequate ventilation. 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.

Personal Protective Measures:

Eye/Face Protection: Wear safety glasses with side shields or safety goggles. Wear a face shield. Maintain approved eye wash station and accessible rinse facilities in work area.

Skin Protection: Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.

Respiratory Protection: An air-purifying, NIOSH-approved respirator with appropriate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a positive-pressure, air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are unknown, or if any other circumstances exist where air-purifying respirators may not provide adequate protection.

Specific Requirements for Personal Protective Equipment: Ensure that glove material is compatible with this product. This information is available from glove manufacturers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise indicated, all properties are given at 25 °C and standard pressure.

Appearance:	Colorless, transparent liquid.
Odor:	Pungent. Acrid.
Odor Threshold:	0.5 ppm as HF
Formula Weight:	20.01 (as HF)
pH:	< 1
Melting/Freezing Point:	-35 °C
Boiling Point/Range:	105 °C
Decomposition Temperature:	No information found.
Flash Point:	Not applicable.
Auto-ignition Temperature:	Not applicable.
Flammability:	Not flammable.
Flammability/Explosive Limits:	Not applicable.
Solubility:	Miscible with water.
Vapor Pressure:	25 mmHg at 20°C
Vapor Density:	2.21 (Air = 1)
Specific Gravity:	1.17 (Water = 1)
Evaporation Rate:	No information found.
Viscosity:	No information found.
Partition Coefficient (n-octanol/water):	No information found.

10. STABILITY AND REACTIVITY

Reactivity Data: Corrosive. See Section 11.

Chemical Stability: Stable under normal conditions.

Conditions to Avoid: Excessive heat, excessive ambient moisture, incompatible materials.

Incompatible Materials: Oxidizers, metals, alkalis, organic materials, water, cyanides, sulfides, sulfites, aldehydes, fluoride, calcium, carbonates, silica, glass, concrete.

Hazardous Decomposition Products: Hydrogen fluoride vapor, hydrogen.

Possibility of Hazardous Reactions: May react vigorously, violently, or explosively with the incompatible materials listed above. Excess thermal conditions may yield hazardous hydrogen fluoride vapor. Contact with metals may produce hazardous concentrations of hydrogen gas.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure: Inhalation, ingestion, skin contact, eye contact.

Acute Effects: May be fatal if swallowed, inhaled, or absorbed through the skin. Causes burns to the eyes, skin, respiratory tract, and gastrointestinal tract. May enter lungs if swallowed or vomited. Liquid and vapors are corrosive. May cause severe tissue damage.

Chronic Effects: Prolonged or repeated exposure may cause fluorosis of bones and joints, hypocalcemia, and hypomagnesemia. Prolonged or repeated exposure may affect the liver, respiratory system, kidneys, central nervous system, and skin.

Toxicological Data:

Hydrogen Fluoride:	LD_{50} Oral, Rat:	5 – 50 mg/kg
	LD_{50} Dermal, Rabbit:	< 50 mg/kg
	LC_{50} Inhalation, Rat:	0.5 – 2 mg/kg
Water:	Not applicable.	

Symptoms of Exposure: Coughing, sore throat, difficulty breathing, inflammation, abdominal pain, diarrhea, vomiting, burns, blurred vision, eye damage.

Carcinogenic Effects: This product is not considered to cause cancer by IARC, ACGIH, NTP, or OSHA.

12. ECOLOGICAL INFORMATION

Ecotoxicological Data: Hydrofluoric Acid:

EC_{50}, Water Flea (Daphnia magna):	270 mg/L 48 h
LC_{50}, Ide (Leuciscus idus):	660 mg/L 48 h

Persistence and Degradability: No information found.

Environmental Effects: Toxic to aquatic life. May leach into groundwater.

13. DISPOSAL INFORMATION

Disposal Instructions: All wastes must be handled in accordance with local, state, and federal regulations. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or into sewers.

Contaminated Packaging: Because emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

Waste Codes: U134: Hydrofluoric Acid

14. TRANSPORT INFORMATION

DOT:

UN Number: UN1790

Proper Shipping Name: Hydrofluoric acid (with not more than 60% strength)

Hazard Class: 8 (6.1)

Packing Group: II

ERG Number: 157

Environmental Hazard Regulations: No information found.

Other Transport Precautions: No information found.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

OSHA: This product is considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Inventory: All components of this product are on the U.S. TSCA Inventory.

U.S. EPCRA (SARA Title III):

Section 302: Hydrogen Fluoride: Reportable Quantity: 100 lb

Sections 311/312:

Hazard Category	List (Yes/No)
Section 311 – Hazardous Chemical	Yes
Immediate Hazard	Yes
Delayed Hazard	No
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No

Section 313: Hydrogen Fluoride: 1.0% De Minimis Concentration

CERCLA Reportable Quantities: Hydrofluoric Acid: 100 lb

International Inventories:

Country or Region	Inventory Name	On Inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*A "Yes" indicates that the listed components of this product comply with the inventory requirements administered by the governing country or region.

16. OTHER INFORMATION

Disclaimer: Rocky Mountain Reagents, Inc. provides the information in this Safety Data Sheet in the belief that it is reliable but assumes no responsibility for its completeness or accuracy. The physical properties reported in this SDS are obtained from literature and do not constitute product specifications. Rocky Mountain Reagents, Inc. makes and gives no representations or warranties with respect to the information contained herein or the product to which it refers, 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. No warranty against infringement of any patent, copyright or trademark is made or implied. This SDS is intended only as a guide to the appropriate handling of the material by a properly trained person. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. Accordingly, Rocky Mountain Reagents, Inc. assumes no liability whatsoever for the use of or reliance upon this information including results obtained, incidental or consequential damages, or lost profits.

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