



SAFETY DATA SHEET

1. Identification

Product identifier Hydrofluoric Acid 49%

Other means of identification

Product code -

Recommended use Industrial use.

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Supplier/Manufacturer Address KMG Electronic Chemicals, Inc.
9555 W. Sam Houston Parkway South
Suite 600
Houston, Texas 77099

Telephone 713-600-3800
Emergency telephone 760-476-3960

Distributed by:



Rocky Mountain Reagents
SCIENTIFIC SOLUTIONS SINCE 1951

4621 Technology Drive, Golden, CO 80403
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Part #: H1023, CF1043

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Acute toxicity, oral	Category 2
Acute toxicity, dermal	Category 1
Acute toxicity, inhalation	Category 2
Skin corrosion/irritation	Category 1A
Specific target organ toxicity, repeated exposure	Category 1 (Kidney, Liver, Lung)

OSHA defined hazards Not classified.

Label elements



Signal word Danger

Hazard statement Fatal if swallowed. Fatal in contact with skin. Fatal if inhaled. Causes severe skin burns and eye damage. Causes damage to organs (Kidney, Liver, Lung) through prolonged or repeated exposure.

Precautionary statement

Prevention Do not breathe mist. Do not get in eyes, on skin, or on clothing. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. Use only outdoors or in a well-ventilated area. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Response If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If swallowed: Immediately call a poison center/doctor. Do not induce vomiting. Rinse mouth. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Specific treatment is urgent (see this label). Get medical advice/attention if you feel unwell.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) Not classified.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Hydrofluoric acid		7664-39-3	49

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

4. First-aid measures

Inhalation

Following inhalation exposure, a 2.5% calcium gluconate solution can be given by nebulizer. If breathing is difficult, give oxygen. Immediately call a poison control center or doctor for treatment advice. Move person to fresh air. If breathing has ceased, start mouth-to-mouth artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Be aware that symptoms of chemical pneumonia (shortness of breath) may occur several hours after exposure.

Skin contact

Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Initiate and maintain gentle and continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour. Cover wound with sterile dressing. A physician should be consulted for all exposures. Burns covering an area greater than fifty-two square centimeters (8 square inches) require immediate treatment by a medical doctor. Remove contaminated clothing. With gloved hand apply 2.5% calcium gluconate gel to the burn area.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. A 1.0 pct calcium gluconate gel solution can be used to irrigate the eye using a syringe or a continuous irrigation device. Get medical attention immediately.

Ingestion

Immediately call a poison control center or doctor for treatment advice. If ingested give milk or calcium gluconate by mouth. Administer several vials of 10% aqueous calcium gluconate orally. (Calcium carbonate or an antacid containing calcium carbonate or magnesium carbonate or hydroxide may also be used.) Do not give anything by mouth to an unconscious person. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Most important symptoms/effects, acute and delayed

Inhalation: May cause damage to mucous membranes in nose, throat, lungs and bronchial system. Eye contact: May cause temporary blindness and severe eye damage. Corrosive. Skin contact: May cause serious chemical burns to the skin. Ingestion: May cause burns in mucous membranes, throat, esophagus and stomach.

Indication of immediate medical attention and special treatment needed

Treatment : This advice is provided to the attending physician because of the specific properties of hydrogen fluoride and hydrofluoric acid. All cases of ingestion and airway exposure, and skin burns with hydrofluoric acid >20% should be regarded as potentially fatal. Patients who have burns and pain within minutes of exposure can be assumed to have been exposed to concentrated acid and are at risk of rapid clinical deterioration and death. Burns can be accompanied by absorption of fluoride through the skin with sequestration of circulating calcium leading to hypocalcemia and hyperkalemia from the release of cell contents. Fatal cardiac dysrhythmias may ensue. A person who has HF burns greater than 25 square inches or who has been burned with concentrated HF should be admitted immediately to an intensive care unit and carefully monitored by EKG for 24 to 48 hours. Blood sampling should be taken to monitor circulating fluoride, potassium and calcium levels. Hemodialysis may be necessary for fluoride removal and correction of hyperkalemia. HF inhaled in high concentrations may cause acute inflammation and edema of the airway and acute pulmonary edema. Anyone who has been exposed to HF gas or mists and experiences respiratory irritation should be admitted to and monitored in an intensive care unit. In some cases, if the eyes are exposed to HF, it may penetrate to internal structures resulting in irreversible damage. HF skin burns are usually accompanied by severe, throbbing pain, which is thought to be due to irritation of nerve endings by increased levels of potassium ions entering the extracellular space to compensate for the reduced levels of calcium ions, which have been bound to the fluoride. RELIEF OF PAIN IS AN IMPORTANT GUIDE TO THE SUCCESS OF TREATMENT.

General information

In case of shortness of breath, give oxygen. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Keep victim warm. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media

This product is not flammable. Use extinguishing agent suitable for type of surrounding fire.

Unsuitable extinguishing media

None known.

Specific hazards arising from the chemical

By heating and fire, toxic and corrosive vapors/gases may be formed.

Special protective equipment and precautions for firefighters

Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire-fighting equipment/instructions

Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Local authorities should be advised if significant spillages cannot be contained. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Stay upwind. Keep out of low areas. Use personal protection recommended in Section 8 of the SDS.

Methods and materials for containment and cleaning up

Should not be released into the environment. Stop the flow of material, if this is without risk. Prevent entry into waterways, sewers, basements or confined areas.

Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Small Spills: Absorb spill with vermiculite or other inert material. Clean contaminated surface thoroughly. After removal flush contaminated area thoroughly with water.

Never return spills in original containers for re-use.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

Handle and open container with care. Use only with adequate ventilation. Avoid any exposure. Do not handle or store near an open flame, heat or other sources of ignition. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep this material away from food, drink and animal feed. Use care in handling/storage. Protect from sunlight. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Hydrofluoric acid (CAS 7664-39-3)	PEL	2.5 mg/m ³

US. OSHA Table Z-2 (29 CFR 1910.1000)

Material	Type	Value
Hydrofluoric acid (CAS 7664-39-3)	TWA	3 ppm

US. ACGIH Threshold Limit Values

Material	Type	Value
Hydrofluoric acid (CAS 7664-39-3)	Ceiling	2 ppm
	TWA	2.5 mg/m ³ 0.5 ppm

US NIOSH Pocket Guide to Chemical Hazards: Ceiling Limit Value and Time Period (if specified)

Material	Type	Value
Hydrofluoric acid (CAS 7664-39-3)	Ceiling	5 mg/m ³ 6 ppm

US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Material	Type	Value
Hydrofluoric acid (CAS 7664-39-3)	TWA	2.5 mg/m ³ 3 ppm

Biological limit values

ACGIH Biological Exposure Indices

Material	Value	Determinant	Specimen	Sampling Time
Hydrofluoric acid (CAS 7664-39-3)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Hydrofluoric acid (CAS 7664-39-3)

Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Hydrofluoric acid (CAS 7664-39-3)

Can be absorbed through the skin.

Appropriate engineering controls

If enclosed handling cannot be guaranteed, ventilation and protective clothing must be used. Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear approved safety glasses or goggles.

Skin protection

Hand protection

Wear protective gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.

Other

Wear appropriate chemical resistant clothing.

Respiratory protection

In case of inadequate ventilation use suitable respirator. Wear approved respiratory protection when working with this material unless ventilation or other engineering controls are adequate to keep airborne concentrations below recommended exposure standards. Follow respirator protection program requirements (OSHA 1910.134 or CSA-Z94.4-02(R2008), and ANSI / AIHA Z88.6) for all respirator use.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Remove and isolate contaminated clothing and shoes. Handle in accordance with good industrial hygiene and safety practice. Launder contaminated clothing before reuse.

9. Physical and chemical properties

Appearance

Colorless liquid.

Physical state

Liquid.

Form

Liquid.

Color

Colorless.

Odor

Pungent.

Odor threshold

Not available.

pH

Acidic

Melting point/freezing point

-118.35 °F (-83.53 °C)

Initial boiling point and boiling range

Not available.

226.4 °F (108 °C)

Flash point

Not available.

Evaporation rate

Not available.

Flammability (solid, gas)

Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not available.

Flammability limit - upper (%)

Not available.

Explosive limit - lower (%)

Not available.

Explosive limit - upper (%)

Not available.

Vapor density

0.7 (air=1)

Relative density

Not available.

Solubility(ies)

Not available.

Completely soluble

Partition coefficient (n-octanol/water)

No data available.

Auto-ignition temperature

Not available.

Decomposition temperature

Not available.

Viscosity

Not available.

Other information

Density	1.15
Molecular formula	HF
Molecular weight	20.01 g/mol

10. Stability and reactivity

Reactivity	Reacts violently with strong bases. Strong alkalis. Strong bases. Sulfides. Cyanides.
Chemical stability	Stable under normal temperature conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong alkalis. Metals. Strong oxidizing agents. Strong bases. Sulfides. Cyanides.
Hazardous decomposition products	Hydrogen fluoride. Toxic fluorides. Gives off hydrogen by reaction with metals

11. Toxicological information

Information on likely routes of exposure

Ingestion	Fatal if swallowed. Causes digestive tract burns.
Inhalation	Fatal if inhaled. Causes respiratory tract burns.
Skin contact	Fatal in contact with skin. Causes severe skin burns. Causes permanent skin damage (scarring).
Eye contact	Causes severe eye burns. May cause blindness.
Symptoms related to the physical, chemical and toxicological characteristics	Inhalation: May cause damage to mucous membranes in nose, throat, lungs and bronchial system. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure. Eye contact: Corrosive. Prolonged contact causes serious eye and tissue damage. May cause blindness. Skin contact: May cause serious chemical burns to the skin. Ingestion: May cause burns in mucous membranes, throat, esophagus and stomach.

Information on toxicological effects

Acute toxicity	Fatal if swallowed. Fatal in contact with skin. Fatal if inhaled.
Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	Causes severe eye burns.
Respiratory sensitization	No data available.
Skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	No data available.
Carcinogenicity	Not classified.

IARC Monographs. Overall Evaluation of Carcinogenicity

Hydrofluoric acid (CAS 7664-39-3) 3 Not classifiable as to carcinogenicity to humans.

Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	May cause damage to the following organs through prolonged or repeated exposure: Liver. Kidney. Lung.
Aspiration hazard	Not classified.
Chronic effects	Can cause cardiovascular effects. May cause damage to the liver and kidneys.
Further information	Can cause cardiovascular effects. May cause damage to the liver and kidneys. May cause lung edema. Symptoms may be delayed.

12. Ecological information

Ecotoxicity	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence and degradability	No data available.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Mobility in general	The product is water soluble and may spread in water systems.
Other adverse effects	Not established. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

13. Disposal considerations

Disposal instructions	Dispose of this material and its container at hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
Local disposal regulations	Dispose of in accordance with local regulations.
Hazardous waste code	U134: Waste Hydrofluoric Acid
US RCRA Hazardous Waste U List: Reference	
Hydrofluoric acid (CAS 7664-39-3)	U134
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Dispose of in accordance with local regulations.

14. Transport information

DOT

UN number	UN1790
UN proper shipping name	Hydrofluoric acid, with not more than 60 percent strength
Transport hazard class(es)	8
Subsidiary class(es)	6.1
Packing group	II
Special precautions for user	Not available.
Special provisions	A6, A7, B15, IB2, N5, N34, T8, TP2, TP12
Packaging exceptions	154
Packaging non bulk	202
Packaging bulk	243
ERG number	157

IATA

UN number	UN1790
UN proper shipping name	Hydrofluoric acid 60% or less strength
Transport hazard class(es)	8
Subsidiary class(es)	6.1
Packaging group	II
Environmental hazards	No
Labels required	Not available.
ERG Code	8P
Special precautions for user	Not available.

IMDG

UN number	UN1790
UN proper shipping name	HYDROFLUORIC ACID solution, with not more than 60% hydrogen fluoride
Transport hazard class(es)	8
Subsidiary class(es)	6.1
Packaging group	II
Environmental hazards	
Marine pollutant	No
Labels required	Not available.
EmS	F-A, S-B
Special precautions for user	Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code This substance/mixture is not intended to be transported in bulk.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Hydrofluoric acid (CAS 7664-39-3) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance Yes

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Hydrofluoric acid	7664-39-3	49

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Hydrofluoric acid (CAS 7664-39-3)

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

Hydrofluoric acid (CAS 7664-39-3)

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) 4.0 mg/l
4.0 mg/l

Food and Drug Administration (FDA) Not regulated.

US state regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Hydrofluoric acid (CAS 7664-39-3)

US. New Jersey Worker and Community Right-to-Know Act

Hydrofluoric acid (CAS 7664-39-3) 100 lbs

US. Pennsylvania RTK - Hazardous Substances

Hydrofluoric acid (CAS 7664-39-3)

US. Rhode Island RTK

Hydrofluoric acid (CAS 7664-39-3)

US. California Proposition 65**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Not listed.

International Inventories

Country(s) 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
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

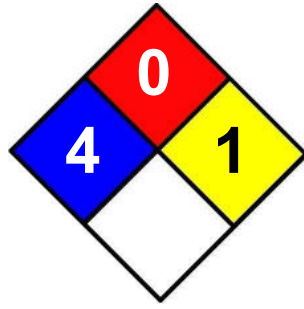
16. Other information, including date of preparation or last revision

Issue date 21-September-2013

Revision date -

Version #
NFPA Ratings

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Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.