

Material Safety Data Sheet

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Version 1.4
Regulation (EC) No 1907/2006

1 - Product and Company Information

Product Name HYDROFLUORIC ACID 73%
Product Number 47610

Company Sigma-Aldrich Company Ltd.
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United Kingdom

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2 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Very toxic by inhalation, in contact with skin and if swallowed.
Causes severe burns.

3 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
HYDROFLUORIC ACID, >60% STRENGTH	7664-39-3	231-634-8	009-003-00-1

Formula HF
Molecular Weight 20.01 AMU
Synonyms Acide fluorhydrique (French) * Acido fluoridrico
(Italian) * Fluorowodor (Polish) *
Fluorwasserstoff (German) * Fluorwaterstof
(Dutch) * Hydrofluoride * Hydrogen fluoride
(ACGIH:OSHA) * RCRA waste number U134 * Rubigine

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is

conscious. Call a physician immediately. Do not induce vomiting.

GENERAL INFORMATION

Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas unless the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious victims. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.
Explosion Hazards: Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.5
Poland		NDSCh	2
Poland		NDSP	-

EXPOSURE LIMITS - EUROPEAN UNION

Source	Type	Value
OEL	OEL	1.5 mg/m ³ 1.8 ppm

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	1.5 mg/m ³ 1.8 ppm

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	2.5 mg/m ³ 3 ppm

Remarks: =1=

Remarks: H

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.6 mg/m ³ 0.8 ppm

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	CLV (Ceil)	1.7 mg/m ³ 2 ppm

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	1.5 mg/m ³ 1.8 ppm

Remarks: M

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	STEL	2.5 mg/m ³ 3 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.
Special Protective Measures: Faceshield (8-inch minimum).

9 - Physical and Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	25 mmHg	20 °C
SG/Density	1.16 g/cm ³	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	1.27 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Conditions to Avoid: Light.

Materials to Avoid: Reacts violently with water. Avoid contact with metals., Alkali metals, Strong bases

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Hydrogen fluoride.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: MW7875000

ACUTE TOXICITY

LCLO
Inhalation
Human
50 ppm
30M

LC50
Inhalation

Rat

1,276 ppm

1H

Remarks: Behavioral:Change in motor activity (specific assay). Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Gastrointestinal:Changes in structure or function of salivary glands.

LC50

Inhalation

Mouse

342 ppm

1H

Remarks: Lungs, Thorax, or Respiration:Dyspnea. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Corneal damage. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other.

LC50

Inhalation

Monkey

1,774 ppm

1H

Remarks: Lungs, Thorax, or Respiration:Cyanosis. Behavioral:Coma. Gastrointestinal:Other changes.

LC50

Inhalation

Guinea pig

4,327 ppm

15M

Remarks: Lungs, Thorax, or Respiration:Respiratory depression. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

IRRITATION DATA

Eyes

Human

50 mg

Remarks: Severe irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

ROUTE OF EXPOSURE

Skin Contact: Causes severe burns.

Skin Absorption: May be fatal if absorbed through skin.

Eye Contact: Material is extremely destructive to the tissue of the eyes.

Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be fatal if inhaled.

Ingestion: May be fatal if swallowed.

TARGET ORGAN INFORMATION

Liver. Kidneys.

CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Rat

1 MG/M3/6H/24D-I

Inhalation

Cytogenetic analysis

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 4980 UG/M3/4H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Embryo or Fetus: Fetal death.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 470 UG/M3/4H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility:

Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1790

Class: 8

PG: I

Subrisk: 6.1

Proper Shipping Name: Hydrofluoric acid

IMDG

UN#: 1790

Class: 8

PG: I

Subrisk: 6.1

Proper Shipping Name: Hydrofluoric acid

Marine Pollutant: No

Severe Marine Pollutant: No

IATA

UN#: 1790
Class: 8
PG: I
Subrisk: 6.1
Proper Shipping Name: Hydrofluoric acid
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 009-003-00-1

NOTA: B

INDICATION OF DANGER: T+-C

Very toxic. Corrosive.

R-PHRASES: 26/27/28-35

Very toxic by inhalation, in contact with skin and if
swallowed. Causes severe burns.

S-PHRASES: 26-36/37/39-28-45

In case of contact with eyes, rinse immediately with plenty of
water and seek medical advice. Wear suitable protective
clothing, gloves, and eye/face protection. After contact with
skin, wash immediately with plenty of water. In case of
accident or if you feel unwell, seek medical advice immediately
(show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

ID-Number: 254

KBwS-Decision

16 - Other Information

WARRANTY

The above information is believed to be correct but does not
purport to be all inclusive and shall be used only as a guide. The
information in this document is based on the present state of our
knowledge and is applicable to the product with regard to
appropriate safety precautions. It does not represent any
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