

Safety Data Sheet

1. Chemical product and company identification

Product name : HYDROFLUORIC ACID (50%)

Company information

Name of manufacturer : KANTO CHEMICAL CO., INC.
 Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan
 Name of section : Electronic materials division technical department
 Telephone number : +81-3-6214-1080
 Facsimile number : +81-3-3241-1043
 Mail address : el-info@kanto.co.jp
 Reference No : GE00172 1.2
 Recommended uses and restrictions : Electronic chemicals

2. Hazards identification

GHS classification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity (oral)	Category 2
	Acute toxicity (dermal)	Category 3
	Acute toxicity (inhalation:dust/mist)	Category 1
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs, cardiovascular)
	Specific target organ toxicity (repeated exposure)	Category 1 (teeth, bone)
Environmental hazards	Aquatic acute	Category 3

Hazard pictograms



Signal word : Danger

Hazard statements : May be corrosive to metals
 Fatal if swallowed or if inhaled
 Toxic in contact with skin
 Causes severe skin burns and eye damage
 Causes damage to organs (respiratory organs, cardiovascular)
 Causes damage to organs (teeth, bone) through prolonged or repeated exposure
 Harmful to aquatic life

Precautionary statements

- Prevention : Keep only in original container.
Do not breathe mist/vapors.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
[In case of inadequate ventilation] wear respiratory protection.
- Response : IF SWALLOWED: Immediately call a POISON CENTER or doctor.
IF SWALLOWED: Rinse mouth. Do not induce vomiting.
IF ON SKIN: Wash with plenty of water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water .
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Call a POISON CENTER or doctor.
Immediately call a POISON CENTER or doctor.
Call a POISON CENTER or doctor if you feel unwell.
Get medical advice/attention if you feel unwell.
Take off immediately all contaminated clothing and wash it before reuse.
Absorb spillage to prevent material-damage.
- Storage : Store in a well-ventilated place. Keep container tightly closed. Store locked up.
- Disposal : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Hydrofluoric acid	50 (as F 48)	HF	Listed	231-634-8	7664-39-3

4. First aid measures

First aid measures

- First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
- First-aid measures after skin contact : Remove contaminated clothing and shoes immediately. Flush affected areas with plenty of water immediately. If possible, apply calcium gluconate jelly on affected areas. Get medical attention.
- First-aid measures after eye contact : Wash the affected areas under running water for at least 15 minutes. Get medical treatment.
- First-aid measures after ingestion : Give the victim milk or 5% calcium gluconate water solution. Get medical attention.

Personal Protection in First Aid and Measures : Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects : The substance is very corrosive to the eyes, skin and respiratory tract. Inhalation of the vapour may cause lung oedema.

5. Fire fighting measures

Suitable extinguishing media : This product is noncombustible.
 Unsuitable extinguishing media : None
 Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.
 Personal protection (Emergency response) : Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Keep away personnel except for authorized ones from spillage area by stretching ropes.

Environmental precautions

Environmental precautions : Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment : Collect the spillage as much as possible to switable empty container. Or else dilute with water gradually and neutralize with calcium hydroxide solution or sodium carbonate solution then wash thoroughly with water.

7. Handling and storage

Handling

Technical measures : Wear proper protective equipment to avoid contact with skin or inhalation of vapor.
 Precautions for safe handling : Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.
 Because this chemical corrodes many kinds of metal, glass and concretes, choose appropriate materials.
 The substance is acidic. Avoid contact with alkaline substances.

Storage

Storage conditions : Store in a dark, cool place and tightly closed.
 Material used in packaging/containers : Polyethylene, fluorine resin.
 Do not use many kinds of metals like carbon steel, low-alloy steel, nickel, glass.

8. Exposure controls / Personal protection equipment

ACGIH TWA	0.5 ppm (as F)
ACGIH Ceiling	2 ppm (as F)
Remark (ACGIH)	Skin

Appropriate engineering controls : Use with an enclosed system or a local exhaust ventilation.

Protective equipment

Respiratory protection : Chemical cartridge respirator with acids vapor cartage or airline respirator

Hand protection : Impervious protective gloves

Eye protection : Safety goggles

Skin and body protection : Protective clothing, protective boots

9. Physical and chemical properties

Physical state : Liquid
 Color : Colorless.
 Odor : Pungent.
 pH : Strong acidity
 Melting point : -35 ° C
 Freezing point : No data available
 Boiling point : 104 ° C
 Flash point : Non flammable.
 Auto-ignition temperature : Non flammable.
 Decomposition temperature : No data available
 Flammability : Non flammable.
 Vapor pressure : No data available
 Relative density : No data available
 Density : 1.18 g/cm³ (20°C)
 Relative gas density : No data available
 Solubility : Water: Miscible.
 Partition coefficient n-octanol/water (log Pow) : No data available
 Explosive limits (vol %) : No data available
 Viscosity, kinematic: : No data available
 Particle characteristics : No data available

10. Stability and reactivity

Reactivity : This substance is a strong acid and reacts with alkaline substances and many metals. Glass also corrodes.
 Chemical stability : Stable under normal conditions. Fuming in air.
 Possibility of hazardous reactions : Corrodes most metals except gold and platinum. At that time, flammable hydrogen gas may be generated.
 Conditions to avoid : Light, heat.
 Incompatible materials : Alkaline substances, metals.
 Hazardous decomposition : Hydrogen fluoride, fluorine.



products

11. Toxicological information

Acute toxicity (oral)	:	Fatal if swallowed It has been reported that when hydrogen fluoride is taken orally, the lethal dose in humans is 1.5 g or 20 mg / kg. Based on the above, it was classified into category 2.
Acute toxicity (dermal)	:	Toxic in contact with skin Chemical burns with a body surface area of 7% caused by 50-70% hydrofluoric acid have been reported to be fatal. Based on the above, it was classified into category 3.
Acute toxicity (inhalation)	:	No classification (gas) Classification not possible (vapor) Fatal if inhaled
Acute toxicity (mist) - Description	:	It has been reported that the lethal concentration of hydrogen fluoride fume is 50-250 ppm (mist, 4-hour equivalent: 0.0008-0.004 mg / L) or higher. Based on the above, it was classified into category 1.
Skin corrosion/irritation	:	Causes severe skin burns When hydrofluoric acid adheres to the skin and mucous membranes, it causes strong painful corrosion locally, causing systemic effects and death in some cases. It is said that if hydrofluoric acid adheres to 50-100 cm ² of the skin, it is necessary to be hospitalized, and if it is 100 cm ² or more, it should be treated with ICU. In addition, in a skin irritation test in rabbits (OECD TG404), significant crusting with destruction of skin tissue occurred and did not recover within 14 days. Based on the above, it was classified into category 1B.
Serious eye damage/irritation	:	Causes serious eye damage The skin corrosion / irritation section of this substance is category 1B. Based on the above, it was classified into category 1.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	Classification not possible
Germ cell mutagenicity	:	No classification It could not be concluded from the results of in vivo tests with hydrofluoric acid (a mouse dominant lethal test, a mutual translocation tests with mouse testes, a chromosomal aberration test with rat bone marrow cells). It was described that evaluation was possible by tests with sodium fluoride, which showed no chromosomal aberration. However, although abnormality was observed in anaphase cells, since fluoride ions do not bind to DNA covalently, and do not form DNA adducts, it is thought to be a secondary effect. Therefore, it is concluded that inorganic fluoride does not induce chromosomal damage in vivo. As for in vitro, a bacterial reverse mutation test was negative.
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	Classification not possible
STOT-single exposure	:	Causes damage to organs (respiratory organs, cardiovascular) As a result of percutaneous exposure to 80% hydrofluoric acid, cases of death due to "dyspnea with chest pain" and "severe hypocalcemia" have been reported. Thus, it was classified into category 1 (respiratory organs, cardiovascular).



- STOT-repeated exposure : Causes damage to organs (teeth, bone) through prolonged or repeated exposure
In humans, it has been reported that fluoride accumulates in bone and tooth buds, and chronic exposure to high levels of fluoride and hydrogen fluoride causes skeletal fluorosis. Based on the above, it was classified into category 1 (teeth, bone).
- Aspiration hazard : Classification not possible

12. Ecological information

Ecotoxicity

- Aquatic acute : Harmful to aquatic life
Chaetogammarus marinus EC50=38.28mg F/L/96h (as sodium fluoride)
- Aquatic chronic : No classification
Oryzias latipes NOEC≥9.9mg F/L/28-day (as sodium fluoride)

Persistence and degradability

No additional information available

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Hazardous to the ozone layer

- Ozone : Classification not possible

13. Disposal considerations

- Ecological waste information : Add the chemical in a large amount of calcium hydroxide solution gradually to precipitate calcium fluoride. Filter the precipitation and bury in a landfill site approved for hazardous waste disposal. Or entrust approved waste disposal companies with the disposal.

<Note>

- *The pH of the neutralization should be above 8.5. The precipitation does not form completely below pH 8.5.
- *If added rapidly calcium hydroxide solution in the chemical, generate heat and the chemical may fly in all directions.
- *As unreacted toxic gas may be emitted at the disposal work, wear appropriate protective equipment. Even a small amount of the gas has the toxicity.

- Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea (IMDG)

- UN-No. (IMDG) : 1790
Proper Shipping Name (IMDG) : HYDROFLUORIC ACID
Packing group (IMDG) : II



Transport hazard class(es) : 8 (6.1)
(IMDG)

Air transport(IATA)

UN-No. (IATA) : 1790
Proper Shipping Name (IATA) : Hydrofluoric acid
Packing group (IATA) : II
Transport hazard class(es) : 8 (6.1)
(IATA)
Marine pollutant : Not applicable
MFAG-No : 157

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : Handbook of dangerous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001) .
Dangerous Properties of Industrial Materials, 6th ed. N. I. Sax Van Nostrand Reinhold Company (1984) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) .
Handbook of Poisonous and Deleterious substances, revised and enlarged edition, Yakumu Kohosa (2000) .
NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully. The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements. The information herein is only provision of information, and it does not represent a guarantee the properties of the product. The Safety Data Sheet (SDS) is prepared based on JIS Z7253.

