

Safety Data Sheet

1. Product and company identification

Product name : Hydrofluoric acid(50%)
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@gms.kanto.co.jp
SDS No. : GE00172

2. Summary of danger and Hazard

GHS classification

Physical and chemical hazard

Flammable liquids : Out of category
Pyrophoric liquids : Out of category
Self-heating substances and mixtures : Out of category

Human health hazard

Acute toxicity(inhalation:vapors) : Category 3
Skin corrosion/irritation : Category 1A
Serious eye damage/eye irritation : Category 1
Specific target organ systemic toxicity(single exposure) : Category 1
Specific target organ systemic toxicity(repeated exposure) : Category 1

Environmental hazard

Hazardous to the aquatic environment-acute hazard : Category 3
Hazardous to the aquatic environment-chronic hazard : Out of category

Pictogram or symbol



Signal word : Danger
Hazard statement : Toxic if inhaled
Causes severe skin burns and eye damage
Causes serious eye damage

Causes damage to organs (respiratory organs, cardiovascular)

Causes damage to organs (nervous system, respiratory organs, teeth, bone) through prolonged or repeated exposure

Harmful to aquatic life

Cautions

- Safety measurements : Do not breathe dust, mist, and vapor.
Use only in a well-ventilated area.
Avoid release to the environment.
Do not eat, drink or smoke when using this product.
Wear appropriate protective gloves, glasses, clothing, face shield, or mask.
Wash protective equipment thoroughly after use.
Wash hands thoroughly after handling.
- First-aid measures : If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
If swallowed: Rinse mouth, do not induce vomiting. Immediately get medical treatment.
If in eyes : Rinse cautiously with water for several minutes. Get medical treatment.
If on skin : Remove contaminated clothing and the substance. Immediately get medical treatment.
If exposed, get medical treatment.
Get medical treatment, if you feel unwell.
- Storage : Tightly container closed and store in a well-ventilated area.
Store locked up.
- Disposal : Dispose of contents and containers appropriately in accordance with related regulations.

3. Composition/Information on ingredients

Substance/Mixture : Substance

Chemical name or commercial name

: Hydrofluoric acid

Ingredients and composition

: Water solution contains 50% Hydrofluoric acid

Chemical formula : HF

CAS No. : 7664-39-3

TSCA Inventory : Registered

EINECS No. : 2316348

Dangerous and hazardous ingredients

: Hydrofluoric acid

4. First aid measures

Inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.
If necessary, get medical treatment.

- 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.
- Eye contact : Wash the affected areas under running water for at least 15 minutes. Get medical treatment.
- Ingestion : Give the victim milk or 5% calcium gluconate water solution. Get medical attention.

5. Fire fighting measures

- Extinguishing media : This product is noncombustible.
- Prohibited extinguishing media : None
- Particular fire fighting : 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.
- Protection for firefighters : Firefighters should wear protective equipment.

6. Accidental release measures

- Cautions for personnel : 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.
- Cautions for environment : 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.
- Removal measure : 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. Cautions of handling and storage

Handling

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

Storage

- Adequate storage condition : Store in a dark, cool place and tightly closed.
- Safety adequate container materials : Polyethylene, fluorine resin
Do not use many kinds of metals like carbon steel, low-alloy steel, nickel, glass.

8. Exposure control/Personal protection

Engineering measures : Use with an enclosed system or a local exhaust ventilation.

Control parameters

ACGIH(2015) : 0.5ppm(TLV-TWA)
2ppm(ceiling) (TLV-STEL)

Protective equipment

Respiration protective equipment

: Chemical cartridge respirator with acids vapor cartage or airline respirator

Hands protective equipment

: Impervious protective gloves

Eyes protective equipment

: Safety goggles

Skin and body protective equipment

: Protective clothing, protective boots

9. Physical and chemical properties

Appearance : Liquid
Color : Colorless
Odor : Acrid odor
Odor threshold : 0.042ppm
pH : Strong acidity
Boiling point : 104°C
Melting point : -35°C
Flash point : Noncombustible
Vapor pressure : 18.6hPa(20°C)
Density : 1.18g/cm³ (20°C)
Solubility
Solubility in solvents : Water ; Miscible

10. Stability and reactivity

Stability : Fuming in air.

Reactivity : As the product is strong acidic, reacts vigorously with alkaline substances, also reacts with chloride salt, bromide salt, or sulfide salts.

Incompatible conditions : Light, heat

Incompatible materials : Alkaline substances, amines, metals.

Hazardous decomposition products

: Hydrogen fluoride gas

11. Toxicological information

Acute toxicity : Oral : Not possible to classify because of insufficient data.
Dermal : Not possible to classify because of insufficient data.
Toxic if inhaled(vapor)(category 3)

Inhalation(dust, mist) : Not possible to classify because of insufficient data.

rat inhalation LC50=650ppm/4H(vapor)

Skin corrosion/irritation : Causes severe skin burns and eye damage(category 1A)

On dermal exposure, the substance penetrates the skin deeply, causing severe pain and corrosivity. Even dilute solution can cause severe pain following contact with fingertip, penetrating under the nail. Peeling nails may occur after a few day of exposure. Thus, the substance was classified into category 1A.

Serious eye damage/eye irritation

: Causes serious eye damage(category 1)

Based on evidence of irreversible effects and corrosivity in animal eye irritation studies and whole-body inhalation exposure to high concentrations, it was classified into category 1.

Respiratory sensitization or Skin sensitization

: Respiratory sensitization : Not possible to classify because of insufficient data.

Skin sensitization : Not possible to classify because of insufficient data.

Mutagenicity : Not possible to classify because of insufficient data.

Carcinogenic effects : Not possible to classify because of insufficient data

ACGIH classifies fluoride as A4(not classifiable as a human carcinogen).

Effects on the reproductive system

: Not possible to classify because of insufficient data.

Specific target organ systemic toxicity single exposure

: Cause damage to organs (respiratory organs, cardiovascular)(category 1)

Incidental exposure of humans to the substance by inhalation and dermal routes caused severe burns to the hands and face, respiratory failure, hypocalcaemia, arrhythmia, and death within 24 hours (three cases). Autopsy revealed pulmonary edema. Hypocalcaemia is considered to be caused by binding fluorine ion to calcium. Thus, it was classified into category 1 (respiratory organs, cardiovascular).

Specific target organ systemic toxicity repeated exposure

: Cause damage to organs (nervous system, respiratory organs, tooth, bone) through prolonged or repeated exposure(category 1)

There is no human data of hydrofluoric acid. ACGIH "fluorides" shows that occupational exposure to inorganic fluorides caused fluorosis-related bone lesions. There is no animal data of hydrofluoric acid, but it can be classified as hydrogen fluoride in terms of toxicity. There are multiple data of hydrogen fluoride. In 91-day inhalation toxicity tests in rats (6 hours/day, 5 days/week), at 7.52 mg/m³ (as guidance value: 6.6 ppm), with the dose of the guidance value range of category 1, death, hair loss, hunchback position, body weight loss, malocclusion, increased number of segmented neutrophil/platelet, decreased red blood cell counts, decreases in blood sugar/albumin/A/G ratio, increased potassium/inorganic phosphorus, and increased relative weights of kidney/liver/lung/testis/spleen/brain/heart/adrenal gland were observed, and in 1-month inhalation toxicity tests in rats (6 hours/day, every day), at 1 mg/m³ (as guidance value: 0.4 ppm), with the dose of the guidance value range of category 1, tooth enamel damage, atrophy and local edema of bronchus mucosa, peribronchial thickening, and abnormal bone marrow cavity were observed.

In 5-month inhalation toxicity tests in rats (continuous exposure), at 0.03 ppm (as guidance value: 0.12 ppm) and more, with doses of the guidance value range of category 1, central nervous system dysfunction (decreased conditioned reflex, extended latency to start motor nerve reflex after stimulation), and at 0.1 ppm (as guidance value: 0.4 ppm), histopathological changes in neuronal synapse were observed. Thus, it was classified into category 1 (nervous system, respiratory organs, teeth, bone).

Aspiration hazard : Not possible to classify because of insufficient data.

12. Ecological information

Ecotoxicity

Fish toxicity : Harmful to aquatic life(category 3)
Chronic aquatic toxicity : Out of category
Amphipods EC50=73.3mg/L/96H
Fish (oryzias latipes) NOEC>9.9mg/L/28-day

Persistence and degradability

: Not available

Bioaccumulative potential : Not available

Mobility in soil : Not available

13. Disposal consideration

Residual disposal : 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.

Containers : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

UN class : Class 8(Corrosive substances) P. G. II

UN number : 1790

Marine regulation information

UN No. : 1790

Proper shipping name : HYDROFLUORIC ACID

Class : 8

Sub risk : 6.1

Packing group : II

Marine pollutant : Not applicable

Aviation regulation information

UN No. : 1790

Proper shipping name : Hydrofluoric acid

Class : 8

Sub risk : 6.1

Packing group : II

15. Regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

References

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 16817 Chemical Products, The Chemical Daily Co. (2017)

Handbook of Poisonous and Deleterious substances, revised and enlarged edition, Yakumu Kohosa(2000)

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, and it has the same required elements on the Material Safety Data Sheet (MSDS) which is prepared based on JIS Z7250:2010.