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Safety Data Sheet

1. Chemical product and company identification

Product name	:	Sodium fluoride

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	37174
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Health hazards	Acute toxicity (oral)	Category 3
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (nervous system, heart, kidney)
	Specific target organ toxicity (repeated exposure)	Category 1 (teeth, bone)
	Specific target organ toxicity (repeated exposure)	Category 2 (heart, liver, kidney, reproductive organs (male))
Environmental hazards	Aquatic acute	Category 3

Hazard pictograms



Signal word : Danger

Hazard statements :
Toxic if swallowed
Causes skin irritation
Causes serious eye damage
Causes damage to organs (nervous system, heart, kidney)
Causes damage to organs (teeth, bone) through prolonged or repeated exposure
May cause damage to organs (heart, liver, kidney, reproductive organs (male)) through prolonged or repeated exposure
Harmful to aquatic life

Precautionary statements

Prevention	:	Do not breathe dust. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	:	IF SWALLOWED: Immediately call a POISON CENTER or doctor. IF ON SKIN: Wash with plenty of water. 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. Get medical advice/attention if you feel unwell. Rinse mouth. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
Storage	:	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
Sodium fluoride	≥ 97	NaF	Listed	231-667-8	7681-49-4

4. First aid measures

First aid measures

First-aid measures after inhalation	:	Remove the victim to fresh air, and make him blow his nose and gargle.
First-aid measures after skin contact	:	Wash the affected areas under running water.
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	:	Rinse mouth with water. Give the victim one or two glasses of water or milk. Do not induce vomiting. Get medical treatment as soon as possible.
Personal Protection in First Aid and Measures	:	Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects	:	If contact with skin, causes skin irritation and inflammation. If contact with eyes, causes eye irritation and conjunctiva inflammation.

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 dust. Conduct operations from upwind and evacuate people downwind.

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	:	Sweep up in a chemical waste container. Flush contaminated area with copious amounts of water.

7. Handling and storage

Handling

Technical measures	:	Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.
Precautions for safe handling	:	Avoid formation of dust and aerosols.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Polyethylene, Polypropylene, etc. Do not use glass, and many kinds of metals.

8. Exposure controls / Personal protection equipment

ACGIH TWA	2.5 mg/m³ (as F)

Appropriate engineering controls	:	Install a local ventilation system in case of dusty condition.

Protective equipment

Respiratory protection	:	If necessary, wear dust mask
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Solid

Color	:	White
Odor	:	Odorless
pH	:	The aqueous solution hydrolyzes and becomes alkaline.
Melting point	:	993 ° C
Freezing point	:	No data available
Boiling point	:	1700 ° C
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability	:	Non flammable.
Vapor pressure	:	No data available
Relative density	:	No data available
Density	:	2.8 g/cm^3
Relative gas density	:	No data available
Solubility	:	Organic solvents: Insoluble in ethanol. Water: 40 g/L (20℃)
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	:	A powerful fluorinating agent. The aqueous solution hydrolyzes and becomes alkaline, corroding the glass. Dissolves in hydrofluoric acid to produce sodium hydrogenfluoride.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Reacts vigorously with acids and emits corrosive hydrogen fluoride gas. When heated, it decomposes and generates corrosive hydrogen fluoride gas.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Acids, oxidizing substances.
Hazardous decomposition products	:	Fluorine, hydrogen fluoride.

11. Toxicological information

Acute toxicity (oral)	:	Toxic if swallowed rat LD50=69mg/kg
Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Causes skin irritation In skin primary irritation tests in rabbits, mild irritation was observed. In 24-hour skin irritation tests in rats, superficial necrosis, edema, and inflammation were observed. Thus, it was classified into category 2.

Serious eye damage/irritation	:	Causes serious eye damage Based on the description in the report on rabbit eye irritation tests: "Corneal epithelial loss and conjunctival necrosis were noted." The substance is thus considered to have severe and irreversible effects on the eye, it was classified into category 1.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	Classification not possible
Germ cell mutagenicity	:	Classification not possible As for in vitro tests, the substance increased dose dependent chromosome aberrations at 10 μg/mL and more. However, as for appropriate in vivo tests, no aberrations were seen. In addition, there is no evidence of germ cell mutagenicity. In summary, the classification was not possible because available positive results are not appropriate.
Carcinogenicity	:	No classification In NTP carcinogenicity tests with rats and mice dosed by drinking water for two years, a slight increase in the incidence of osteosarcoma in male rats was observed. This was regarded as equivocal evidence of carcinogenicity, but it was concluded that there is no evidence of carcinogenicity in female rats and male and female mice. Moreover, in carcinogenicity tests with rats and mice dosed by feeding for two years, it was negative in rats. On the other hand, in mice, an increase in osteoma was observed at the high dose, however, there was the retroviral infection, so, it is regarded that the increase in osteoma is not conclusive. In classification results by other organizations, this substance is classified in D by EPA, fluorides are classified in A4 by ACGIH, and fluorides (inorganic, used in drinking water) are classified in group 3 by IARC, respectively. From the above, it was classified as "No classification" based on the test results and the classification results by other organizations.
Reproductive toxicity	:	Classification not possible In both two-generation drinking water studies of the substance in rats and drinking-water developmental toxicity tests in rats or rabbits, no effects, or slight effects at dosing levels toxic to dams, which cannot be used for classification, were noted. In summary, oral exposure to the substance causes no clear reproductive toxicity. Thus, the classification was not possible because of insufficient data.
STOT-single exposure	:	Causes damage to organs (nervous system, heart, kidney) Studies show that a man who was orally administered 120 g of insecticide powder containing 97% sodium fluoride developed myotonia, ventricular fibrillation, and esophageal stricture after two hours of exposure. Fluorine ion binds to blood calcium to cause hypocalcaemia, which may result in myotonia, decreased myocardial contractility, and cardiovascular collapse. Animal studies have shown that lethal dose (oral administration) of fluorides including the substance is 20-100 mg F/kg and salivation, lacrimation, vomiting, diarrhea, muscular fibrillation, and hypofunction of respiratory organs/heart/whole body were observed as acute toxic symptoms. Moreover, in single oral studies of the substance 50 mg/kg in rats, polyuria and increased urinary excretion of inorganic phosphorus, calcium, magnesium, potassium, and sodium were observed. These doses correspond to category 1 guidance values. Thus, it was classified into category 1 (nervous system, heart, kidney).

STOT-repeated exposure	:	Causes damage to organs (teeth, bone) through prolonged or repeated exposure May cause damage to organs (heart, liver, kidney, reproductive organs (male)) through prolonged or repeated exposure There is no human data of the substance. ACGIH "fluorides" states that occupational exposure to inorganic fluorides causes fluorosis-related bone lesions. Animal studies have shown that in 26-week repeated oral dose toxicity studies by drinking water in rats and mice, regarding rats at 100 ppm with the dose of the guidance value range of category 2, gastric mucosal hyperplasia, at 300 ppm, suppression of body weight gain, focal degeneration of incisor enamel, and gastric ulcer were observed, and regarding mice, at 50 ppm and more with the dose of the guidance value range of category 1, increased osteoid, at 300 ppm with the dose of the guidance value range of category 2, focal degeneration of incisor enamel, and in premature death cases of the same group, acute nephritis, hepatic lesions, myocardial lesions, and testicular lesions were observed. In a 103-week repeated oral dose toxicity study by drinking water in rats and mice, regarding rats, at 25 ppm and more within the guidance value range of category 1, dentin dysplasia of incisor, odontoblast degeneration, ameloblast degeneration, at 175 ppm within the guidance value range of category 2, osteosclerosis, and regarding mice, at 175 ppm within the guidance value range of category 2, dental anomalies, and dentin dysplasia were observed. Of them, gastric changes were not used for classification because they were due to irritation. Thus, it was classified into category 1 (teeth, bone) and category 2 (heart, liver, kidney, reproductive organs (male)).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Harmful to aquatic life Chaetogammarus marinus EC50=84.6mg/L/96h
Aquatic chronic	:	No classification Orizias latipes NOEC≧9.9mg/L/28-day

Persistence and degradability

No additional information available

Bioaccumulative potential

Low bioconcentration
BCF : ≤0.66 (5mg/L), ≤6.4 (0.05mg/L)

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 consult approved disposal companies.

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)	:	1690
Proper Shipping Name (IMDG)	:	SODIUM FLUORIDE, SOLID
Packing group (IMDG)	:	III
Transport hazard class(es) (IMDG)	:	6.1

Air transport(IATA)

UN-No. (IATA)	:	1690
Proper Shipping Name (IATA)	:	Sodium fluoride, solid
Packing group (IATA)	:	III
Transport hazard class(es) (IATA)	:	6.1
Marine pollutant	:	Not applicable
MFAG-No	:	154

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 : Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) .
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.