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Safety Data Sheet

1. Chemical product and company identification

Product name : Iron(Ⅲ) chloride hexahydrate

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	:	16018
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 4
	Skin corrosion/irritation	Category 1C
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (systemic toxicity)
	Specific target organ toxicity (single exposure)	Category 3 (respiratory tract irritation.)
Environmental hazards	Aquatic acute	Category 3

Hazard pictograms

Signal word : Danger

Hazard statements :
Harmful if swallowed
Causes severe skin burns and eye damage
May cause respiratory irritation
Causes damage to organs (systemic toxicity)
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.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response	:	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. IF SWALLOWED: Rinse mouth. Do not induce vomiting. 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. Rinse mouth.
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
Iron(Ⅲ) chloride hexahydrate	≥ 97	FeCl3・6H2O	Listed	231-729-4	10025-77-1

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, get medical treatment as soon as possible.
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	:	Inhalation causes inflammation and pain of throat mucous membrane, cough, and nausea.

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 : If necessary, wear proper protective equipment to avoid contact with skin or inhalation of dust.

Precautions for safe handling : Avoid formation of dust and aerosols.

Storage

Storage conditions : As the chemical is deliquescent, keep the bottle tightly closed and store in a cool place.

Material used in packaging/containers : Store in glass or polyethylene bottles. Mild steel, copper, aluminium, and zinc are corroded.

8. Exposure controls / Personal protection equipment

ACGIH TWA	1 mg/m³ (as Fe)

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 : Yellow - brown

Odor : Odorless

pH : Strong acidity

Melting point : 36.5 ° C

Freezing point	:	No data available
Boiling point	:	280 ° 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	:	No data available
Relative gas density	:	No data available
Solubility	:	Organic solvents: Soluble in acetone, ethanol. Water: 71.7 % (0℃)
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	:	It is oxidative and may react on contact with reducing substances. Aqueous solutions are strongly acidic and corrode many metals.
Chemical stability	:	Stable under normal conditions. Deliquescent.
Possibility of hazardous reactions	:	When heated, it decomposes and produces chlorine gas.
Conditions to avoid	:	Light, heat, moisture.
Incompatible materials	:	Reducing substances、metals.
Hazardous decomposition products	:	Chlorine, hydrogen chloride.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=900mg/kg (as Iron(Ⅲ) chloride)
Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Causes severe skin burns Iron(Ⅲ) chloride : There is a description that this substance is a strong acid, and the pH of a 0.1M solution is 2.0, and therefore, it was classified into category 1C.
Serious eye damage/irritation	:	Causes serious eye damage Iron(Ⅲ) chloride : There is a description that this substance is a strong acid, and the pH of a 0.1M aqueous solution is 2.0. In addition, after application of a 40% aqueous solution of this substance to rabbits, it was severely irritating. From the above results, it was classified into category 1.
Respiratory sensitization	:	Classification not possible

Skin sensitization	:	Classification not possible Iron(Ⅲ) chloride : There is a description that in a test with guinea pigs, a positive reaction was observed in 1 out of 2 animals. However, no conclusions could be drawn because of a small number of animals and insufficient details of the test method.
Germ cell mutagenicity	:	No classification Iron(Ⅲ) chloride : As for in vivo, it was negative in a mouse bone marrow micronucleus test. As for in vitro, it was positive in 1 mouse lymphoma test with cultured mammalian cells but was negative in multiple bacterial reverse mutation tests and mouse lymphoma tests with cultured mammalian cells.
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	Classification not possible Iron(Ⅲ) chloride : Classification not possible due to lack of data. Besides, there was no information on reproductive toxicity study. However, there are reports that spermatogenesis in the testis and epididymis was an effect in a test by administration to the testis of rats, and that preimplantation mortality was seen in a test by administration to the vagina of rats 1 day before mating. These tests were not adopted as evidence of classification because the administration routes were different from the usual reproductive developmental toxicity test. In addition, there is a report that no effects on dams and fetuses were seen in a teratogenicity study with rats by the oral route (drinking water). However, it was the study with only one-dose and was not adopted for classification.
STOT-single exposure	:	Causes damage to organs (systemic toxicity) May cause respiratory irritation Iron(Ⅲ) chloride : Although not this substance, inhalation of ferric compounds such as dusts and mists is irritating to the respiratory tract. As for this substance, there is a case report of one person who accidentally ingested 200 mL of a ferric chloride solution (pH 1) and developed hypoxemia, severe metabolic acidosis with respiratory alkalosis initially and vomiting, drowsy consciousness, tachycardia, tachypnea 3 hours after ingestion and died of severe vomiting and cardiopulmonary arrest 4 hours after ingestion. Besides, there is a report of vomiting, diarrhea, mild lethargy, upper abdominal pain and pallor by the oral ingestion of ferric compounds in humans, and hyperglycemia, cyanosis, stupor, acidosis, hematemesis and coma in severe cases. There is a description of effects on the stomach mucosa and the cardiovascular/peripheral circulation, metabolic acidosis, and effects on the central nervous system by the oral ingestion of iron sulfate (Ⅱ). From the above, this substance was considered to be irritating to the respiratory tract, therefore, it was classified into category 3 (respiratory tract irritation). In addition, although it was considered to cause systemic effects, the target organ could not be identified, therefore, it was also classified into category 1 (systemic toxicity).

STOT-repeated exposure	:	Classification not possible In a 13-week study in which ferric chloride hexahydrate (Ⅲ) was administered by drinking water to rats, the No Observable Adverse Effect Level was reported to be 5,000 ppm However, it was not the result of a study conducted with sufficient evaluation items including histopathological examination. There is a description that the divalent ferrous ion is oxidized to the trivalent ferric ion in the stomach despite the low pH, and this then chelates with proteins which retain the iron in soluble form available for absorption into the small intestinal mucosa. Although repeated dose toxicity studies were extensively investigated including those on divalent iron compounds, in combined repeated dose toxicity studies with the reproduction/developmental toxicity screening test (OECD TG 422) in which ferrous sulfate heptahydrate (Ⅱ) for up to 49 days or ferrous chloride (Ⅱ) for up to 54 days was administered by gavage to rats, respectively, there was no toxicity within or lower than the dose range for category 2, and even in the high dose group, only pigmentation in the spleen and liver, and hemal effects, etc. were seen but no serious target organ toxicity was observed. From the above, although it was considered corresponding to "Not classified" by the oral route, there was no toxicity information by the other routes. Therefore, it was classified as "Classification not possible" due to lack of data.
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Harmful to aquatic life Daphnia pulex LC50=37.5mg/L/48h (as iron(Ⅲ) chloride)
Aquatic chronic	:	No classification Daphnia magna NOEC=2.0mg/L/21-day (as iron(Ⅲ) chloride)

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	:	Dissolve in water and add calcium hydroxide solution or sodium carbonate solution to precipitate iron hydroxide. 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)	:	3260
Proper Shipping Name (IMDG)	:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.
Packing group (IMDG)	:	III
Transport hazard class(es) (IMDG)	:	8

Air transport(IATA)

UN-No. (IATA)	:	3260
Proper Shipping Name (IATA)	:	Corrosive solid, acidic, inorganic, n.o.s.
Packing group (IATA)	:	III
Transport hazard class(es) (IATA)	:	8
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 : Dangerous Properties of Industrial Materials,6th ed. N.I.Sax Van Nostrand Reinhold Company (1984) .
Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
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.