
Safety Data Sheet**1. Chemical product and company identification****Product name** : 0.1mol/L Ammonium iron(III) sulfate solution**SDS code** : S2-01**Company/undertaking identification** :

HAYASHI PURE CHEMICAL IND.,LTD.

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URL : <https://www.hpc-j.co.jp/>**Emergency number** : 06-6910-7305**Recommended use** : For research and experimental use only.**Restrictions on use** : Do not use on a human body or for animal medicines, foods, household products, cosmetics, etc.**2. Hazards identification****GHS classification**

| | | | |
|--|--|---------------------------------|-----------------------------|
| Physical hazards | Explosives | classification not possible | |
| | Flammable gases | No classification | |
| | Aerosol | classification not possible | |
| | Oxidizing gases | No classification | |
| | Gases under pressure | No classification | |
| | Flammable liquids | classification not possible | |
| | Flammable solids | No classification | |
| | Self-reactive substances and mixtures | classification not possible | |
| | Pyrophoric liquids | classification not possible | |
| | Pyrophoric solids | No classification | |
| | Self-heating substances and mixtures | classification not possible | |
| | Substances and mixtures which in contact with water emit flammable gases | classification not possible | |
| | Oxidizing liquids | classification not possible | |
| | Oxidizing solids | No classification | |
| | Organic peroxides | classification not possible | |
| | Corrosive to metals | Category 1 | |
| | Desensitized explosives | classification not possible | |
| | Health hazards | Acute toxicity (oral) | classification not possible |
| | | Acute toxicity (dermal) | classification not possible |
| | | Acute toxicity (inhalation:gas) | classification not possible |
| Acute toxicity (inhalation:vapors) | | classification not possible | |
| Acute toxicity (inhalation:dust/mist) | | Category 4 | |
| Skin corrosion/irritation | | Category 1 | |
| Serious eye damage/eye irritation | | Category 1 | |
| Respiratory sensitization | | classification not possible | |
| Skin sensitization | | classification not possible | |
| Germ cell mutagenicity | | classification not possible | |
| Carcinogenicity | classification not possible | | |
| Reproductive toxicity | classification not possible | | |
| Specific target organ toxicity (single exposure) | Category 2 (respiratory system) | | |

| | | |
|-----------------------|---|---------------------------------|
| Environmental hazards | Specific target organ toxicity (repeated exposure) | Category 2 (respiratory system) |
| | Aspiration hazard | classification not possible |
| | Hazardous to the aquatic environment, short-term (acute) | classification not possible |
| | Hazardous to the aquatic environment, long-term (chronic) | Category 3 |
| | Hazardous to the ozone layer | classification not possible |

Hazard pictograms (GHS JP)



GHS05



GHS07



GHS08

| | |
|-----------------------------------|--|
| Signal word (GHS JP) | : Danger |
| Hazard statements (GHS JP) | : May be corrosive to metals (H290) Causes severe skin burns and eye damage (H314) Harmful if inhaled (H332) May cause damage to organs (respiratory system) (H371) May cause damage to organs (respiratory system) through prolonged or repeated exposure (H373) Harmful to aquatic life with long lasting effects (H412) |
| Precautionary statements (GHS JP) | |
| Prevention | : Keep only in original container. (P234) Do not breathe dust/fume/gas/mist/vapors/spray. (P260) Wash hands, forearms and face thoroughly after handling. (P264) Do not eat, drink or smoke when using this product. (P270) Use only outdoors or in a well-ventilated area. (P271) Avoid release to the environment. (P273) Wear protective gloves/protective clothing/eye protection/face protection. (P280) |
| Response | : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. (P301+P330+P331) IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. (P303+P361+P353) IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340) IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338) IF exposed or concerned: Call a POISON CENTER or doctor. (P308+P311) Immediately call a POISON CENTER or doctor. (P310) Get medical advice/attention if you feel unwell. (P314) Wash contaminated clothing before reuse. (P363) Absorb spillage to prevent material-damage. (P390) |
| Storage | : Store locked up. (P405) Store in corrosive resistant container with a resistant inner liner. (P406) |
| Disposal | : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation. (P501) |

3. Composition/information on ingredients

Distinction of substance or mixture : Mixture

| Name | Concentration or Concentration range | Formula | Kanpo number | | CAS RN |
|--|--------------------------------------|---|-----------------|-----------------------------|-----------|
| | | | CSCL no | ISHL no | |
| Ammonium Iron(III) sulfate dodecahydrate | About 4.75% | FeNH ₄ (SO ₄) ₂ ·12H ₂ O | (1)-359,(1)-400 | - | 7783-83-7 |
| Sulfuric acid | About 1.8% | H ₂ SO ₄ | (1)-430 | Existing Chemical Substance | 7664-93-9 |
| Potassium permanganate | About 0.0003% | KMnO ₄ | (1)-446 | Existing Chemical Substance | 7722-64-7 |
| Water | About 93.4497% | H ₂ O | - | - | 7732-18-5 |

The above concentration or concentration range are not product specification.
All percentages listed in the above concentration or concentration range are wt%, unless otherwise specified.

4. First aid measures

First aid measures

- First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
Get immediate medical advice/attention.
- First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing.
Gently wash with plenty of soap and water.
Get immediate medical advice/attention.
- First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Get immediate medical advice/attention.
- First-aid measures after ingestion : Do NOT induce vomiting.
Drink plenty of water.
Rinse mouth.
Get immediate medical advice/attention.

5. Fire fighting measures

- Suitable extinguishing media : Water spray, Alcohol-resistant foam, Dry powder, Carbon dioxide, Sand.
- Unsuitable extinguishing media : Do not use a heavy water stream.
- Explosion hazard : May induce explosion of containers by heating.
- Hazardous decomposition products in case of fire : In case of fire, product may produce irritative or toxic fumes/gases.
- Firefighting instructions : If ignited, for the initial fire-fighting, cut off combustion sources, extinguish fire at a stroke using appropriate fire-extinguishers.
In the case of peripheral fire, quickly remove movable containers to safe places.
If unable to be moved containers, sprinkle water to containers and surrounding equipment, etc. to cool.
Avoid (reject) fire-fighting water to enter environment.
Even after extinguishing fire, thoroughly cool containers by using plenty of water.
- Protection during firefighting : Wear appropriate fire-resistant clothing including self contained-compressed air breathing apparatus.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

- General measures : Before entering, ventilate the area.
Do not let unauthorized persons come close to the area.
Immediately place the leakage area in isolation, with taking proper distances for all directions.
Wear appropriate personal protective devices to prevent inhalation and contact with eye, skin, and clothing, and never attempt to work on the lee.

Environmental precautions

Environmental precautions : Avoid release to the environment.
Prevent entry to sewers and public waters.

Methods and Equipment for Containment and Cleaning up

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it.
Collect leaking and spilled liquid in sealable containers as far as possible.
Wash out the spilled area with large amounts of water.
If possible, neutralize with slaked lime, soda ash, etc. before washing out.

7. Handling and storage**Handling**

Technical measures : Work with appropriate personal protective equipment to prevent inhalation or contact to eyes, skin, and clothing.
Handle with care to prevent leakage, overflowing, or scattering, minimize generation of mist or vapor, and thoroughly ventilate.

Precautions for safe handling : Do not eat, drink or smoke when using this product.
Thoroughly wash your hands and gargle after handling.
Ensure good ventilation of the work station.
Do not contact, breathe or swallow.

Prevents handling of incompatible substances or mixtures : Avoid prolonged or repeated exposure.

Storage

Storage conditions : Store locked up.
Store in a well-ventilated place, away from direct sunlight. Keep container tightly closed and keep away from fire and heat sources.
Store in corrosive resistant container with a resistant inner liner.

Material used in packaging/containers : Light shielding airtight container.

Technical measures : Comply with applicable regulations.

Storage temperature : Cool and dark place

8. Exposure controls / Personal protection equipment

| Exposure limit values | |
|-------------------------------|--|
| Sulfuric acid | |
| Exposure limits (JSOH) | 【Ceiling】1mg/m3 |
| Exposure limits (ACGIH) | TWA 0.2 mg/m3(T),STEL - |
| Potassium permanganate | |
| Japan administration level | 0.2mg/m3(as Mn) |
| Exposure limits (JSOH) | 0.2mg/m3(as Mn, except Organic compounds) |
| Exposure limits (ACGIH) | TWA 0.02 mg/m3(R) ·0.1 mg/m3(I),STEL - (as Mn) |

Appropriate engineering controls : Cover up tightly the generation source at the handling place or install local exhaust equipment or overall ventilation equipment. Install safety showers and eye-fountains near a handling place. Clearly indicate the location.

Protective equipment

Respiratory protection : Gas mask for acid gases

Hand protection : Impervious protective gloves

Eye protection : Protective glasses (general glasses, glasses with side-shields, goggles)

Skin and body protection : Impervious aprons, Impervious work clothing, Impervious long boots

9. Physical and chemical properties

Physical state : Liquid

Appearance : Liquid

Color : pale yellow

Odor : Odorless

pH : ≤ 1 (25°C)

| | |
|---|---------------------------------|
| Melting point | : No data available |
| Freezing point | : No data available |
| Boiling point | : No data available |
| Flash point | : No data available |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapor pressure | : No data available |
| Relative density | : No data available |
| Density | : 1.03 g/cm ³ (20°C) |
| Relative gas density | : No data available |
| Solubility | : No data available |
| 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 | : No data available |
| Chemical stability | : Stable under normal handling conditions. |
| Possibility of hazardous reactions | : It is strong acid and reacts with strong bases. May react with strong oxidizing agents and strong reducing agents. |
| Conditions to avoid | : Sunlight, heat. Contact with strong bases, strong oxidizing agents and strong reducing agents. |
| Incompatible materials | : Strong bases, Strong oxidizing agents, Strong reducing agents |
| Hazardous decomposition products | : Nitrogen oxides, Sulfur oxides, Iron compounds |

11. Toxicological information

The information in this section is based on the "GHS Classification Results" by NITE.

| As a product | |
|--|--|
| Acute toxicity (oral) | classification not possible |
| Acute toxicity (dermal) | classification not possible |
| Acute toxicity (inhalation) | vapors:classification not possible Gases:classification not possible dust, mist:Category 4 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/irritation | Category 1 |
| Respiratory sensitization | classification not possible |
| Skin sensitization | classification not possible |
| Germ cell mutagenicity | classification not possible |
| Carcinogenicity | classification not possible |
| Reproductive toxicity | classification not possible |
| STOT-single exposure | Category 2 |
| STOT-repeated exposure | Category 2 |
| Aspiration hazard | classification not possible |
| Ammonium Iron(III) sulfate dodecahydrate | |
| Acute toxicity (oral) | No data available |
| Acute toxicity (dermal) | No data available |
| Acute toxicity (gas) | No data available |
| Acute toxicity (vapour) | No data available |
| Acute toxicity (inhalation:dust/mist) | No data available |
| Skin corrosion/irritation | No data available |
| Serious eye damage/irritation | No data available |
| Respiratory sensitization | No data available |
| Skin sensitization | No data available |
| Germ cell mutagenicity | No data available |
| Carcinogenicity | No data available |

| Ammonium Iron(III) sulfate dodecahydrate | |
|---|--|
| Reproductive toxicity | No data available |
| STOT-single exposure | No data available |
| STOT-repeated exposure | No data available |
| Aspiration hazard | No data available |
| Sulfuric acid | |
| Acute toxicity (oral) | Category 5 |
| Acute toxicity (dermal) | classification not possible |
| Acute toxicity (gas) | No classification |
| Acute toxicity (vapour) | classification not possible |
| Acute toxicity (inhalation:dust/mist) | Category 2 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/irritation | Category 1 |
| Respiratory sensitization | classification not possible |
| Skin sensitization | No classification |
| Germ cell mutagenicity | classification not possible |
| Carcinogenicity | classification not possible |
| Reproductive toxicity | No classification |
| STOT-single exposure | Category 1 |
| STOT-repeated exposure | Category 1 |
| Aspiration hazard | classification not possible |
| Potassium permanganate | |
| Acute toxicity (oral) | Category 4 |
| Acute toxicity (dermal) | classification not possible |
| Acute toxicity (gas) | No classification |
| Acute toxicity (vapour) | No classification |
| Acute toxicity (inhalation:dust/mist) | classification not possible |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/irritation | Category 1 |
| Respiratory sensitization | classification not possible |
| Skin sensitization | classification not possible |
| Germ cell mutagenicity | Category 2 |
| Carcinogenicity | classification not possible |
| Reproductive toxicity | Category 2 |
| STOT-single exposure | Category 3 (Respiratory tract irritation.) |
| STOT-repeated exposure | Category 1 |
| Aspiration hazard | classification not possible |
| Water | |
| Acute toxicity (oral) | No classification |
| Acute toxicity (dermal) | No classification |
| Acute toxicity (gas) | No classification |
| Acute toxicity (vapour) | No classification |
| Acute toxicity (inhalation:dust/mist) | No classification |
| Skin corrosion/irritation | No classification |
| Serious eye damage/irritation | No classification |
| Respiratory sensitization | No classification |
| Skin sensitization | No classification |
| Germ cell mutagenicity | No classification |
| Carcinogenicity | No classification |
| Reproductive toxicity | No classification |
| STOT-single exposure | No classification |
| STOT-repeated exposure | No classification |
| Aspiration hazard | No classification |

12. Ecological information

The information in this section is based on the "GHS Classification Results" by NITE.

| As a product | |
|---|-----------------------------|
| Hazardous to the aquatic environment, short-term (acute) | classification not possible |
| Hazardous to the aquatic environment, long-term (chronic) | Category 3 |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Ozone | classification not possible |
| Ammonium Iron(III) sulfate dodecahydrate | |
| Hazardous to Aquatic Environment - Acute Hazard | No data available |
| Hazardous to Aquatic Environment - Chronic Hazard | No data available |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Hazardous to the ozone layer | No data available |
| Sulfuric acid | |
| Hazardous to Aquatic Environment - Acute Hazard | Category 3 |
| Hazardous to Aquatic Environment - Chronic Hazard | Category 1 |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Hazardous to the ozone layer | classification not possible |
| Potassium permanganate | |
| Hazardous to Aquatic Environment - Acute Hazard | Category 1 |
| Hazardous to Aquatic Environment - Chronic Hazard | Category 1 |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Hazardous to the ozone layer | classification not possible |
| Water | |
| Hazardous to Aquatic Environment - Acute Hazard | No classification |
| Hazardous to Aquatic Environment - Chronic Hazard | No classification |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Hazardous to the ozone layer | classification not possible |

13. Disposal considerations

- Ecology - waste materials : With the detail information of the waste, subcontract its disposal to a waste disposer authorized by a Prefectural Governor.
- Contaminated container and packaging : Empty the packaging completely prior to disposal.
Empty containers should be taken for recycle, recovery or waste in accordance with local regulation.

14. Transport information

International Regulations

Transport by sea(IMDG)

| | |
|------------------------------------|--|
| UN-No. (IMDG) | : 1760 |
| Proper Shipping Name (IMDG) | : CORROSIVE LIQUID, N.O.S. |
| Packing group (IMDG) | : II |
| Transport hazard class(es) (IMDG) | : 8 |
| Hazard labels (IMDG) | : 8 |
| Class (IMDG) | : 8 |
| Special provision (IMDG) | : 274 |
| Packing instructions (IMDG) | : P001 |
| IBC packing instructions (IMDG) | : IBC02 |
| Tank instructions (IMDG) | : T11 |
| Tank special provisions (IMDG) | : TP2, TP27 |
| Stowage category (IMDG) | : B |
| Properties and observations (IMDG) | : Causes burns to skin, eyes and mucous membranes. |
| MFAG-No | : 154 |

Air transport(IATA)

| | |
|--|----------------------------|
| UN-No. (IATA) | : 1760 |
| Proper Shipping Name (IATA) | : Corrosive liquid, n.o.s. |
| Packing group (IATA) | : II |
| Transport hazard class(es) (IATA) | : 8 |
| Hazard labels (IATA) | : 8 |
| Class (IATA) | : 8 |
| PCA Excepted quantities (IATA) | : E2 |
| PCA Limited quantities (IATA) | : Y840 |
| PCA limited quantity max net quantity (IATA) | : 0.5L |
| PCA packing instructions (IATA) | : 851 |
| PCA max net quantity (IATA) | : 1L |
| CAO packing instructions (IATA) | : 855 |
| CAO max net quantity (IATA) | : 30L |
| Special provision (IATA) | : A3, A803 |
| ERG code (IATA) | : 8L |

Marine pollutant : Not applicable

Regulations in Japan

| | |
|-------------------------------|---|
| Regulatory information by sea | : Conform to the provisions of the Ship Safety Law. |
| Regulatory information by air | : Conform to the provisions of the Civil Aeronautics Law. |
| MFAG-No | : 154 |

Special transport precautions : When transporting, load containers so that they do not tip over, damage, drop or collapse. Make sure there is no leak in containers.

15. Regulatory information

National law

| | |
|---|---|
| Industrial Safety and Health Law | : Group 3 Specified Chemical Substance, (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.2 Para.1, Item 6) Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1) Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18 Item 1, Item 2, Attached Table No.9) Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Item 1, Item 2, Attached Table No.9) Sulfuric acid (Ordinance number : 613) Water-soluble iron salts (Ordinance number : 352) Corrosive Liquids (Ordinance on Industrial Safety and Health Law Art. 326) Substances on dental health checkup (Act, Art.66, Para.3, Enforcement Order, Art.22 Item 3) |
| Japanese Poisonous and Deleterious Substances Control Law | : Not applicable |
| Water Pollution Prevention Law | : Designated Chemical Substances (Law Article 2, Paragraph 4, Enforcement Order Article 3-3) |
| Fire Service Law | : Not applicable |

| | |
|---|--|
| Air Pollution Control Law | : Specified substances (Article 17, Paragraph 1 of the Law, Article 10 of the Enforcement Ordinance) Hazardous Air Pollutants, Priority Substances (Central Environment Council Report No. 9) |
| Foreign Exchange and Foreign Trade Control Act | : Export Trade Control Ordinance appendix 1-16 |
| Ship Safety Act | : Corrosive substances (Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations) |
| Civil Aeronautics Law | : Corrosive substances (Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations) |
| Port Regulation Law | : Corrosive substances (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods) |
| Waste Management on Public Cleansing Law | : Specially Controlled Industrial Wastes (Act Art.2, para 5, Enforcement Order Art.2-4) |
| Waterworks Law | : Hazardous Substances (Act Article 4 paragraph 2), Standard for Water Quality (Ministry Order No.101 of 2003) |
| Sewerage Law | : Substances for Water Quality Standard (Act Art.12-2 Para.2, Enforcement Order Art.9-4) |
| Japanese Pollutant Release and Transfer Register Law (PRTR Law) | : Not applicable |
| Labor Standards Act | : Chemical Substances Causing Occupational Illnesses (Act Art.75, Para.2, Ordinance Attached Table 1-2, Item 4-1, MHLW Notification No.36 of 1978) |

16. Other information

| | |
|-------------------|--|
| Data sources | : Handbook of 17423 Chemical Products, The Chemical Daily Co, Ltd. International Chemical Safety Cards. National Institute of Technology and Evaluation (NITE). 2020 Emergency Response Guidebook (ERG 2020). |
| Other information | : The SDS is copyrighted material of Hayashi Pure Chemical Ind, Ltd. This Safety Data Sheet is intended to be provided for business operators who handle chemical substance products of the relevant product and is not intended to assure safety in any way. The Safety Data Sheet does not verify all the information on the applicable chemical substance in the present time. With the recognition in that unknown danger constantly exists in the relevant chemical substance, the product shall be used in the principle of self-responsibility of the user with the highest priority to safety from transport and unpacking to disposal. When the relevant chemical substance is used, the user him/herself shall collect safety information and shall investigate laws and regulations at the place, organizations, countries, etc. where the substance is actually used and give the highest priority to them. The Company shall take no responsibility for investigating state and local regulations and the user shall handle this problem on his/her own responsibility. In the event that SDS in Japanese and SDS translated into other languages exist, the document described in Japanese is prior to all other documents whether or not there is any difference in contents, and documents in other languages shall be references. |