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**Safety Data Sheet****1. Chemical product and company identification****Product name** : Perchloric acid (70%)**SDS code** : E9-14**Company/undertaking identification** :

HAYASHI PURE CHEMICAL IND.,LTD.

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URL : <https://www.hpc-j.co.jp/>**Emergency number** : 06-6910-7305**2. Hazards identification****GHS classification**

Physical hazards	Desensitized explosives	classification not possible	
	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	Category 1	
	Oxidizing solids	No classification	
	Organic peroxides	classification not possible	
	Corrosive to metals	Category 1	
	Health hazards	Acute toxicity (oral)	Category 4
		Acute toxicity (dermal)	classification not possible
		Acute toxicity (inhalation:gas)	No classification
Acute toxicity (inhalation:vapors)		classification not possible	
Acute toxicity (inhalation:dust/mist)		classification not possible	
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	Category 2		
Reproductive toxicity	Category 2		
Specific target organ toxicity (single exposure)	Category 3 (Respiratory tract irritation.)		
Specific target organ toxicity (repeated exposure)	Category 1 (thyroid gland)		
Aspiration hazard	classification not possible		

Environmental hazards	Hazardous to the aquatic environment, short-term (acute)	No classification
	Hazardous to the aquatic environment, long-term (chronic)	No classification
	Hazardous to the ozone layer	classification not possible

## Hazard pictograms (GHS JP)



GHS03



GHS05



GHS07



GHS08

## Signal word (GHS JP)

: Danger

## Hazard statements (GHS JP)

: May cause fire or explosion; strong oxidizer (H271)  
 May be corrosive to metals (H290)  
 Harmful if swallowed (H302)  
 Causes severe skin burns and eye damage (H314)  
 May cause respiratory irritation (H335)  
 Suspected of causing cancer (H351)  
 Suspected of damaging fertility or the unborn child (H361)  
 Causes damage to organs (thyroid gland) through prolonged or repeated exposure (H372)

## Precautionary statements (GHS JP)

## Prevention

: Obtain special instructions before use. (P201)  
 Do not handle until all safety precautions have been read and understood. (P202)  
 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210)  
 Keep away from clothing and other combustible materials. (P220)  
 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)  
 Wear protective gloves/protective clothing/eye protection/face protection. (P280)  
 Wear fire resistant or flame retardant clothing. (P283)

## Response

: IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. (P301+P312)  
 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 ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. (P306+P360)  
 IF exposed or concerned: Get medical advice/attention. (P308+P313)  
 Immediately call a POISON CENTER or doctor. (P310)  
 Get medical advice/attention if you feel unwell. (P314)  
 Wash contaminated clothing before reuse. (P363)  
 In case of fire: Use specify appropriate media to extinguish. (P370+P378)  
 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. (P371+P380+P375)  
 Absorb spillage to prevent material-damage. (P390)

## Storage

: Store in a well-ventilated place. Keep container tightly closed. (P403+P233)  
 Store locked up. (P405)  
 Store in corrosive resistant container with a resistant inner liner. (P406)  
 Store separately. (P420)

## 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	
Perchloric acid	About 70%	HClO <sub>4</sub>	(1)-221	Existing Chemical Substance	7601-90-3
Water	About 30%	H <sub>2</sub> 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 mass%, 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
- Unsuitable extinguishing media : Foam, Dry powder, Do not use a heavy water stream.
- Fire hazard : May intensify fire; oxidizer.
- 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.  
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**

- 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, Protective long boots

**9. Physical and chemical properties**

- Physical state : Liquid
- Appearance : Liquid
- Color : colorless
- Odor : Irritating odor
- pH : Strong acid
- Melting point : -112 °C (anhydrous)
- Freezing point : No data available
- Boiling point : 203 °C (72%, azeotrope)
- 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 : 1.76 g/cm<sup>3</sup> (22°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	:	When heated, it decomposes to produce toxic hydrogen chloride. And when heated, it may cause explosion. Reacts with many kinds of organic compounds, and may ignite and explode. When in contact with reducing substances and combustible substances, it poses a risk of fire and explosion. Corrodes many kinds of metals to produce flammable gas (hydrogen).
Conditions to avoid	:	Sunlight, heat. Contact with strong acids, strong bases, combustible substances, reducing substances, organic compounds, and metals.
Incompatible materials	:	Strong acids, Strong bases, Combustible substances, Reducing substances, Organic compounds, Metals
Hazardous decomposition products	:	Hydrogen chloride, Chlorine, Hydrogen, Oxygen

## 11. Toxicological information

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

As a product	
Acute toxicity (oral)	Category 4
Acute toxicity (dermal)	classification not possible
Acute toxicity (inhalation)	vapors:classification not possible Gases:No classification 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	classification not possible
Carcinogenicity	Category 2
Reproductive toxicity	Category 2
STOT-single exposure	Category 3 (Respiratory tract irritation.)
STOT-repeated exposure	Category 1
Aspiration hazard	classification not possible
Perchloric acid	
Acute toxicity (oral)	Category 4
Acute toxicity (dermal)	classification not possible
Acute toxicity (gas)	No classification
Acute toxicity (vapour)	classification not possible
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	classification not possible
Carcinogenicity	Category 2
Reproductive toxicity	Category 2
STOT-single exposure	Category 3 (Respiratory tract irritation.)
STOT-repeated exposure	Category 1
Aspiration hazard	classification not possible

<b>Water</b>	
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.

<b>As a product</b>	
Hazardous to the aquatic environment, short-term (acute)	No classification
Hazardous to the aquatic environment, long-term (chronic)	No classification
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Ozone	classification not possible
<b>Perchloric acid</b>	
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
<b>Water</b>	
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)	: 1873
Proper Shipping Name (IMDG)	: PERCHLORIC ACID
Packing group (IMDG)	: I
Transport hazard class(es) (IMDG)	: 5.1 (8)
Hazard labels (IMDG)	: 5.1,8
Class (IMDG)	: 5.1
Subsidiary hazard (IMDG)	: 8
Division (IMDG)	: 5.1
Special provision (IMDG)	: 900
Packing instructions (IMDG)	: P502
Packing provisions (IMDG)	: PP28
Tank instructions (IMDG)	: T10
Tank special provisions (IMDG)	: TP1
Stowage category (IMDG)	: D
Properties and observations (IMDG)	: Colourless liquid.Mixtures with combustible material may ignite spontaneously and, when involved in a fire, by shock or by friction, may cause an explosion. Highly corrosive to most metals. Causes burns to skin, eyes and mucous membranes. Transport of PERCHLORIC ACID with more than 72% acid, by mass is prohibited.
MFAG-No	: 143

#### Air transport(IATA)

UN-No. (IATA)	: 1873
Proper Shipping Name (IATA)	: Perchloric acid
Packing group (IATA)	: I
Transport hazard class(es) (IATA)	: 5.1 (8)
Hazard labels (IATA)	: 5.1, 8
Class (IATA)	: 5.1
Subsidiary hazards (IATA)	: 8
Division (IATA)	: 5.1
PCA Excepted quantities (IATA)	: E0
PCA Limited quantities (IATA)	: Forbidden
PCA limited quantity max net quantity (IATA)	: Forbidden
PCA packing instructions (IATA)	: Forbidden
PCA max net quantity (IATA)	: Forbidden
CAO packing instructions (IATA)	: 553
CAO max net quantity (IATA)	: 2.5L
ERG code (IATA)	: 5C
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	: 143
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	: Not applicable
Japanese Poisonous and Deleterious Substances Control Law	: Not applicable
Fire Service Law	: Group 6 - Oxidizing liquids - Perchloric acid (Law Art.2 Para 7, Attached Table 1, Group 6)
Foreign Exchange and Foreign Trade Control Act	: Export Trade Control Ordinance appendix 1-16
Ship Safety Act	: Oxidizing substances and organic peroxides/Oxidizing substances (Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Civil Aeronautics Law	: Oxidizing substances and organic peroxides/Oxidizing substances (Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

- Port Regulation Law : Oxidizing substances and organic peroxides/Oxidizing substances (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)
- Road Act : Restriction for Vehicle Traffic (Enforcement Order Art.19-13, Publication of Japan Highway Public Corp.)
- Waste Management on Public Cleansing Law : Specially Controlled Industrial Wastes (Act Art.2, para 5, Enforcement Order Art.2-4 )
- Japanese Pollutant Release and Transfer Register Law (PRTR Law) : 【After amendment of April 2023】  
Class 1 Designated Chemical Substances (Act, Art.2, Para.2, Enforcement Order, Art.1 Appended Table 1)  
Perchloric acid and its ammonium, potassium, sodium, magnesium or lithium salt (70%)

## 16. Other information

- Data sources : Handbook of 17322 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.