

# Safety Data Sheet

## 1. Product and Company Identification

Chemical name. : Hydrogen Peroxide  
 Manufacturer's name : SANTOKU CHEMICAL INDUSTRIES CO., LTD.  
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 Section in charge : Logistics & Procurement Department

### Recommended use of chemicals and restrictions on use :

For electrical Industries : cleaning solution or oxidizing agent for semiconductor manufacturing

For general industries : Oxidizing agent, molder, base agent for environmental protection,

Bleaching : paper, pulp, natural fiber and so on

## 2. Hazard Identification

### GHS Classification

#### Physical and Chemical Hazard

Explosive : Not applicable

Flammable liquid : Not applicable

Self-reactive chemical : Not applicable

Pyrophoric liquid : Not applicable

Self-heating chemical : Not applicable

Oxidizing liquid : Class-2

#### Human Health Hazard

Acute toxicity (oral) : Class-4

Acute toxicity (dermal) : Class-5

Acute toxicity (inhalation : vapors) : Class-4

Skin corrosion – irritation : Class-1A – 1C

Germ cell mutagenicity : Out of Classification

Carcinogenicity : Out of classification

Serious eye damage – Eye irritation : Class-1

Reproductive toxicity : Class-2

Specific target organ systemic toxicity (single exposure) : Class-1(Aspiratory / Central nerve system)

Specific target organ systemic toxicity (repeated exposure) : Class-1(lung) Class-2(blood)

#### Environmental Hazard

Aquatic environment acute hazard : Class-2

Aquatic environment chronic hazard : Out of classification

#### Element of label

#### Pictogram or Symbol



#### Signal Word

: Danger

#### Hazard Statement

May intensify fire or explosion : oxidizer

Harmful if swallowed

May be harmful in contact with skin

Harmful if inhaled

Causes severe skin burns

Causes serious eye damage

Suspected of damaging fertility or the unborn child

Causes damage to organs (respiratory organs and central nerve system)

Causes damage to organs (lung and blood) through prolonged or repeated exposure

Toxic to aquatic life

### 3. Composition / Information on Ingredients

Substance  
Chemical name : Hydrogen peroxide  
Chemical formula: : H<sub>2</sub>O<sub>2</sub>  
Chemical characteristic (chemical formula or structural formula) : HO-OH  
CAS No. : 7722-84-1  
UN No. : 2014 Class 5.1 Packing grade-II  
Concentration : 31wt% of hydrogen peroxide 、 69wt% of water (CAS No. 7732-18-5)

### 4. First-aid measures

- Inhalation : Remove the victim to fresh air and let him rest with easy breathing.  
Seek medical attention immediately.
- Skin contact : Take off affected clothing or remove them out immediately.  
If it is difficult to remove contaminated clothes, wash over the clothes with water spray.  
Wash affected skin with soap and running water or shower.  
Seek medical attention immediately.  
Wash contaminated clothing before reuse.
- Eye contact : Wash affected eyes with water for a few minutes carefully.  
If contact lens used and it is easy to remove, remove it.  
Continue to wash affected eyes.  
Seek medical attention immediately.
- Ingestion : Let him/her gargle. Do not force to vomit.  
Seek medical attention immediately.
- Anticipated acute symptoms and delayed symptoms:
  - Inhalation : sore throat, cough, vertigo, headache, nausea, breathlessness.
  - Skin contact : corrosive, vitiligo, redness, skin burn, pain.
  - Eye contact : redness, pain, filmy eyes, serious burn.
  - Ingestion : sore throat, stomachache, abdominal fullness, nausea, vomits.

### 5. Fire Fighting Measures

- Fire extinguishant : Small fire : water  
: Major fire : A plenty of water
- Inappropriate extinguishant : powder extinguisher, bubble extinguisher
- Specific danger and hazard : It may accelerate burning when caught in fire.  
The container may be explored by heat
- Specific extinguish methods : Evacuate from affected area, extinguish from a certain distance due to danger of explosion.  
When major fire, extinguish from proper distance to fired area.  
If no danger, remove containers from fired area  
If unable to remove containers, cool down them by sprinkling to the containers and surrounding area.  
Fire fighting activities should be carried out from effective and proper distance.  
Cool down the containers with a plenty of water properly even after extinguishment.
- Protection for fire fighting persons: Use appropriate breathing equipment and wear chemical protection clothes.

### 6. Accidental Release Measures

- Warning points to human body, protective equipment and emergency actions :
- Do not touch spilled substances and not walk within it.
  - Segregate the affected area as released area with proper distance to all direction.
  - Prohibit to enter the area except concerned persons
  - Use appropriate protective equipment to avoid contact to eyes and skin, and inhalation of gas.  
(see "8. Exposure Controls / Personnel Protection" )
  - Do not touch damaged containers or spilled chemicals without personnel protective equipment.
- Stay on the windward.  
Keep away from low ground

Ventilate prior to enter confined area.

Warning points to environment : Pay attention not to affect to environment by discharging to rivers.  
Do not discharge to environment.

#### Collection

When minor release : Flush the affected area with a plenty of water.

When major release : Collect spilled chemicals, preventing from increasing spilled area with sands.

Preventive measures for secondary accident :

Separate combustible materials ( wood, paper, oil and etc.) from spilled chemicals.

## 7. Handling and Storage

Handling :

Prevention on exposure of handling persons :

Use appropriate personnel protective equipment with proper materials. Permeable and combustible materials (natural leather, cotton and rayon) is not suitable. And it is important to provide safety shower, eye washer and so on at work spaces. Take preventive measures to avoid spills and leakage.

Prevention from fire and explosion :

Keep fire away at handling area do not put combustible and flammable materials.

Pipes as well as containers for hydrogen peroxide should not be fully sealed.

Local and Whole ventilation :

Provide local or whole area ventilation at work place as needed

Caution to safety handling :

Close up with dedicated caps to avoid contamination of foreign materials such as particles, heavy metals, alkalis.

Storage :

Appropriate Storage Conditions

Store in a well-ventilated room away from fire to prevent hydrogen peroxide from becoming hot.  
(Avoid direct sunlight, It is desirable to store it in a cool and dark place)

Equipped with leak prevention facilities.

Use the dedicated cap with a vent hole and avoid full closure. Install vent pipe for tank storage.

Check damages of containers and leakage from it.

Prepare tap waters for emergency use.

Lock the doors at storage place and control personnel entrance.

Prohibited Material for co-storage :

Do not store with combustible materials and materials to accelerate decomposition of hydrogen peroxide, such as particles, heavy metals, lusters, acids, alkalis and solvents

Storage Conditions to avoid :

Do not return hydrogen peroxide into the containers.

Do not use containers which are used for other chemicals.

Do not lie the containers on their side. Leakage may occurred since its caps has vent hole with filter when it is lied on its side.

## 8. Exposure Controls / Personnel Protection

Allowable concentration

Japan Association of Industrial Health (2005): Not applicable

ACGIH TLV-TWA: 1 ppm (2005).

Facilities

: Provide safety shower and eye shower at work place and storage area.

: Ventilate to keep concentration in the air within allowable limit.

Personnel Protective Equipment

Respiratory Protection

: Use appropriate respiratory protective equipment in handling.

Do not use dust protective mask or gas mask with chemical-cartridge.

Hand Protection

: Use chemically resistant gloves.

Wear full body chemical wears when there is possibility to exposure droplet.

Eye Protection

: Use appropriate eye and face protective equipment in handling.

Skin And Body Protection

: Use appropriate face protective equipment

In order to protect from contact of chemicals, use gloves, apron and boots or fully covered chemical wears of non-penetrative materials. Use full body chemical wears when there is possibility to exposure droplet.

## 9. Physical and Chemical Properties

Physical property, form, color	: clear colorless liquid
Odor	: Weak characteristic odor (ozone-like smell)
pH and its concentration	: 30 wt% aqueous solution: 3.8
Melting point	: -26 degrees Celsius at 30 wt%,
Boiling point:	: 106 degrees Celsius at 30 wt%
Flash point	: Non-combustible
Explosibility range	: Non-combustible
Vapor pressure	: 30wt% : Total pressure of $3.1 \times 10^3$ Pa at 30 degree of centigrade,
Density:	: 30wt% : 1.12 g/cm <sup>3</sup> at 4 degrees Celsius
Solubility in solvent	: Freely soluble to water, soluble to alcohol and ester

## 10. Stability and Reactivity

Stability : Stable unless mixed with foreign materials, alkalis, heavy metals, organic substances likely to be oxidized, etc.

Possibility of hazardous reactions

Intensely decomposes with heat generation when mixed with foreign materials.

Examples of inappropriate materials for hydrogen peroxide:

Iron, copper, copper alloy, silver, platinum, titanium, polyamide (nylon), polybutadiene, epoxy resin, natural rubber and asbestos-molding material

Incompatible materials

: ammonia, metals, oxidizing agent, combustible materials, reducing materials

Hazardous and harmful decomposition product

: Generates oxygen gas which is susceptible to burn

## 11. Toxicological Information

[Acute toxicity]

(Animal experiment)

Inhalation toxicity:

- Forced inhalation of 100 ppm vapor: bronchitis, lung edema and death in short time
- LCLo of mice : 227 ppm
- LD50 of rats : 2g /m<sup>3</sup>/4h

Oral toxicity:

- Oral administration of 4 g/kg H<sub>2</sub>O<sub>2</sub> to male and female rats leads to death in 1-3 hr.
- LD50 of mice : 2 g/kg
- LD50 of rats : 1.518 g /kg

Transdermal toxicity:

- LD50 of rats : 4.060 g /kg
- LD50 of mice : 12 g/kg
- LDLo of rabbits : 0.5 g/kg

[Sub-acute toxicity]

(Animal experiment)

Oral administration of 5 wt/vol% solution for 3 months to male rats: the inactive amount is 56.2 mg/kg of H<sub>2</sub>O<sub>2</sub>.

[Local effect]

When inhaled:

- It may cause bleeding due to inflammation in esophagus and gastric mucous membrane.

When stuck to the skin:

- It causes chemical injuries (vitiligo) accompanied by pain.

When put into the eye:

- It causes chemical injuries are caused with drastic pain.
- It may lead to low vision, astigmatism and blindness.

When swallowed:

- It may cause abdominal pain, nausea, pharyngodynia, vomition and abdominal swelling.

[Chronic toxicity and long term toxicity]

Unknown. Generally it is said that hydrogen peroxide is readily decomposed by a catabolic enzyme, catalase.

[Carcinogenicity]

LARC : group 3

ACGIH : A3

Enhancement effect of carcinogenesis in the superior portion of duodenojejunalis in rats.

[Mutagenicity]

DNA damage of *Bacillus subtilis* by 50 mmol/l and of hamster lung by 353µmol/l of the product.

Microorganism : *Salmonella* (+S9); positive.

Abnormal chromosome: Hamster (in vitro); positive.

## 12. Ecological Information

[Residual tendency/decomposability]

Through its decomposition, hydrogen peroxide generates oxygen and water, which do not pollute the environment.

[Biological accumulation]

Generally it is said that hydrogen peroxide is readily decomposed by a catabolic enzyme, catalase.

[Predictable behavior of chemical substances in the environment/possible environmental influence/biological toxicity]

- It has weak toxicity to aquatic organisms.

Fish toxicity (seawater fish): *Siganus* : 24 hr, LC<sub>50</sub> = 224 mg H<sub>2</sub>O<sub>2</sub>/l

*Gobiidae* : 24 hr, LC<sub>50</sub> = 155 mg H<sub>2</sub>O<sub>2</sub>/l

*Trachurus* : 24 hr, LC<sub>50</sub> = 89 mg H<sub>2</sub>O<sub>2</sub>/l

Fish toxicity (freshwater fish): *Cyprinus* : 48 hr, LC<sub>50</sub> = 42 mg H<sub>2</sub>O<sub>2</sub>/l

- Flow of hydrogen peroxide into activated sludge facilities results in extinction of microorganisms (activated sludge) or in weakening their action. Accordingly, it may lower treatment efficiency of facilities or make them inefficient.

- When it flows into public water areas, it will affect pH and COD of the regulated standard items, depending on the amount.

## 13. Disposal Considerations

[Disposal method for residual waste]

Dispose of the residual waste according to the related laws and regulations and related local rules.

Request waste treatment to the permitted company or local public agency if any.

Disposal method:

- Small volume: Dilute fully with a large volume of water.

- Large volume:

1. Lead to a safe place such as a pit.

2. Dilute with water until concentration of hydrogen peroxide reaches about 3-5%.

3. Add a reducing agent such as sodium sulfite, metals, catalase or the like to slowly decompose hydrogen peroxide.

4. Dispose the waste in comply with local laws and regulations.

[Disposal method for polluted container and package]

Containers and bottles to be used should be re-used with clean conditions or disposed properly in accordance with national and local laws and regulations. When disposed the empty containers, empty the contents completely.

## 14. Transport Information

[Land transportation]

UN No. : 2014

Class : 5.1 (Oxidizing substances)

Packing Group : II

[Marine transportation]

IMDG UN No. : 2014

Propper shipping name : Hydrogen peroxide aqueous solution

Class : 5.1

Sub risk : 8

Packingt Group : II

Marine pollutant : Not applicable

[Air transportation]

ICAO/IATA : Class 5.1  
Sub risk : 8  
Packingt Group : II

substances with a concentration of over 40% are prohibited from been loaded.

[Specific safety measures and conditions for transportation]

- Load a transport container keeping its mouth upward, taking care not to drop it, let it fall down or incur damage.
- After loading the transport container, inspect the state of the cargo and whether there is a leak from the container.
- For a tanker, inspect thoroughly the valve on the tank bottom, other valves and the inlet.
- Transport such that the transport container is not subjected to friction or shaking and,
- When there is a danger of a disaster caused by a leak, etc., take preventative measures as well as inform the nearest police, firehouse, public health center, etc.

## 15. Regulatory Information

Ensure these materials in compliance with international rules, local laws and regulations.

## 16. Other Information

[Sources]

- 1) "Collected Notifications Related to Standards of Poisonous and Deleterious Substances": Yakumu Koho Co., Ltd. (2000).
- 2) Japan Chemical Society ed., "Collected Guides of Chemical Disaster Prevention", Maruzen (1996).
- 3) Kikuo Oikawa, "Profiles of Dangerous and Harmful Chemical Substances 100" Maruzen (1992).
- 4) "Safety Data Sheet for Chemical Products", No. HP-0305. Hodogaya Chemical Co., Ltd.,
- 5) "Collected Laws and Ordinances of Chemical Products", Chemical Daily Co., Ltd. (1996).
- 6) "Industrial Safety and Health Law, Total Data of Substances Subject to MSDS", Chemical Daily Co., Ltd. (2007).
- 7) Homepage of Japan Advanced Information center of Safety And Health、GHS model MSDS (2008)

## 17. Notice On Description

The contents described are prepared based on obtainable documents, information, data, etc.; however, no guarantee is established for contents, physical properties, dangerous and harmful properties. In addition, the matters to be noted are subjects for usual handling. Accordingly, in case of special handling of this product, take safety measures prior to use.

End of SDS