

# Material Safety Data Sheet

## 1. Chemical Product and Company Identification

Product name	Aqueous solution of Hydrogen peroxide 30 ~ 65 wt%
Recommended product use and restriction on the use	
Recommended product use	<p>Bleaching agent in paper,pulp, fabric, etc..</p> <p>For manufacturing organic peracid, organic peroxides, chlorite,sodium, epoxy Compounds, rubber medicine, agricultural chemicals, etc.</p> <p>Smelting nickel, zinc, etc.</p> <p>Decolorization of sulfuric acid</p> <p>Electronics industry such as germanium etching.</p> <p>Food sterilizing, conservation, bleaching</p> <p>Improvement in germination ability of agricultural seed etc.</p> <p>Chemical detergent, slime remover, reagent, medicine(Oxidol)</p>
Restrictions on the use	No data available
Manufacturer/ importer / distributor's information	
Company name	HANSOL CHEMICAL CO., LTD.
HEAD OFFICE'S ADDRESS	Garak building 8th floor, 8-2, Garak-dong, Songpa-gu, Seoul, South Korea.
PHONE	(02) 2152-2399
FACTORY'S ADDRESS	231, Yeochon-dong, Nam-gu, Ulsan
PHONE	816, Yongam-ri, Bongdong-eup, Wanju-kun, Chonlabuk-do
THE DEPARTMENT IN CHARGE	Ulsan plant (052) 259-8000, Chonju plant (063) 260-8141
THE PERSON IN CHARGE	Hydrogen peroxide team
Emergency Tel No.	Ulsan plant :Hong Hun chul, Chonju plant : Jung kwang hee
	Ulsan plant (052) 259-8061, Chonju plant (063) 260-8141

## 2. HAZARDS IDENTIFICATION

Classification	<p>Oxidative liquid : Category 2</p> <p>Acute toxic(Oral) : Category 4</p> <p>Skin causticity/skin pungent : Category2</p> <p>Acute eye damageability/eye irritation : Category 2</p> <p>Reproductive toxicity : Category 2</p> <p>Specific target organ toxicity(single exposure) : Category 1 (respiratory, the central nervous system )</p> <p>Specific target organ toxicity(repeated exposure : Category1 (lung) Category2 (blood)</p>
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### 3. COMPOSITION /INFORMATION ON INGREDIENTS

INGREDIENT	SYNONYMS	CAS No.	EN No.	CONTENT
Hydrogen peroxide	HYDROGEN PEROXIDE	7722-84-1	231-765-0	30 ~ 60
WATER	Dihydrogen Oxide	7732-18-5	231-791-2	Balance

### 4. FIRST AID MEASURES

EYE CONTACT	Flush eye immediately with plenty of water for at least 15 minutes. Get medical aid immediately.
SKIN CONTACT	Remove contaminated clothing and shoes. Flush skin immediately with plenty of soap and water. Wash the contaminated clothing and shoes before reuse. Get medical aid immediately.
INHALATION	Stay away from source of exposure. Get medical aid immediately. If breathing is difficult, oxygen supply may be necessary. If breathing has ceased, apply artificial respiration.
SWALLOWING	Drink plenty of water. Do not induce vomiting. Get medical aid immediately.
Notes to physician	Do not wash the stomach or induce vomiting. In case of inhaling chemicals, consider oxygen supply.

### 5. FIRE FIGHTING MEASURES

Suitable(unsuitable) extinguishing agent	
Suitable extinguishing agent	Different extinguishing agent depending on the kinds of combustible materials.  Water – wood, paper, fabric, plastic Powder, Foam, CO <sub>2</sub> -oil or a large amount of solvent
Unsuitable extinguishing agent In case of big fire	No information available Spray plenty of water. Apply water from a protected location or from a safe distance..
Specific hazards coming from chemicals	
Pyrolysis product Fire and explosion hazard	Oxygen If container is exposed to impact, friction or heat, it may rupture or It may ignite combustible material . Fire risk could be ignored. If decomposition or foreign substances exist. It could explode at room temperature. Contact with the surface of aluminium at a temperature above 150°C could cause explosion even without decomposition.
Special protective equipment for fire fighting and prevention	
	Move container from fire area if it can be done without risk. Stay away from the ends of tanks. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 " " \\ Cool containers with water spray until well after the fire is out. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	
	<p>Wear personal protective equipment and do not work facing wind.</p> <p>Avoid contact with combustible material.</p> <p>Do not touch the leak with hands.</p> <p>Isolate hazard area and Keep unnecessary people away.</p> <p>Use water spray to reduce the vapors</p>
ENVIRONMENTAL PRECAUTIONS	
	Dillute with pleny of water immediately.
METHODS FOR CLEANING UP	
A small amount of release	Use water spray to reduce the vapors
A large amount of release	<p>Stop leak if possible without personal risk.</p> <p>Isolate hazard area and Keep unnecessary people away.</p> <p>Stop leak with things like sand and dilute with plenty of water.</p> <p>Notify the appropriate authorities(government departments/ a local government) in case of dicharge more than a standard amount.</p>

## 7. HANDLING AND STROAGE

HANDLING	<p>Ventilate the whole area or provide ventilation utilizing local ventilation sysem.</p> <p>Wear protective gloves, garment ,aprons and etc..</p> <p>Avoid keeping Hydrogen peroxide tightly closed because it can decompose and generate oxygen gas.</p> <p>Wash body and clothing after using chemicals.</p>
STORAGE	<p>Avoid contact with combustible and reducing materials.</p> <p>Store in a cool and dark area.</p> <p>Store in well-ventilated area.</p> <p>Take cautions not to be mixed with other materials and keep container tightly closed.</p> <p>Keep unnecessary people away from the storing place and deny</p> <p>Store and use in accordance with governmental and local laws/regulations.</p>

## 8. Exposure control/Personal Protection

A. Chemical materials exposure standard, Biological exposure standard etc.	
Domestic limits	TWA – 1ppm, 1.5mg/m <sup>3</sup>
ACGIH limits	TWA – 1 ppm, TLV–STEL – 2 ppm
Biological exposure limits	No data available
B. Engineering Controls	
	<p>Protect from direct sunlight</p> <p>Ensure working process is appropriate to permissible exposure limits of the Labor Department.</p>
C. Personal protection	
Respiratory protection	In case of frequent or intensive exposure use self-contained respiratory protective device
Eye protection	<p>Do not wear contact lenses.</p> <p>Provide an emergency face wash fountain and quick drench shower in</p> <p>Wear safety goggles to protect eye from scattering materials and harmful liquids.</p>
Hand protection	Wear appropriate chemical resistant gloves.
Body protection	Wear chemical resistant apron and boots

## 9. Physical and chemical properties

A. Appearance	colorless clear liquid
B. Odour	A little of pungent smell
C. Threshold value	Not applicable
D. pH	1.2 ~ 3.5
E. Decomposition point	-32.8 °C
F. Boiling point/boiling range	111 °C
G. Flash point	No data available
H. Evaporation rate	No data available
I. Flammability	No data available
J. Upper and lower level in the range of ignition and explosion	No data available
K. Vapour pressure	23 mmHg (30 °C)
L. Solubility	100 g/100ml (25 °C)
M. Vapour density	1.2 (air=1)
N. Relative density(density)	1.13 ~ 1.22
O. Partition coefficient: n-octanol/water)	No data available
P. Spontaneous Combustion temperature	- 32.52 kcal/mol
Q. Heat of decomposition	- 23.45 kcal/mol
R. Viscosity	1.115 cP (20 °C)
S. Molecular weight	34.01

## 10. Stability and Reactivity

A. Chemical stability	
	When heated to above 141 °C, explosive decomposition could Contact with organic matter, heavy metal or mixing with plenty of dust cause decomposition ,oxygen gas accompanied with decomposition heat.
B. Condition of instability	Not polymerizing
C. Condition to avoid ( Electrostatic discharge , impact, oscillation, etc.)	Avoid sources of ignition such as heat, flame, spark and others. Contact with combustible materials could cause ignition or Avoid contact with contaminated materials. Try to maintain the purity of BPO. If the container is exposed to heat , it can rupture or explode.
D. Materials to avoid	Combustible materials, acid, metallic oxides, metals, reducing agents, amine.
E. Hazardous decomposition	Pyrolysis product:carbon oxides

## 11. Toxicological Information

A. Possible route of exposure	
Inhalation	Steam inhalation ratio is biggest in body's absorption.
Oral	Less possibility
SKIN CONTACT	Possible
Eye contact	Possible

B. Health Hazards	
Acute oral toxicity	LD50 50 % : 910 mg/kg Rat
Acute dermal toxicity	LD50 4,060 mg/kg Rat
Acute inhalation toxicity	Steam LC50 1,438 ppm Rat
Skin corrosion or irritation	A rabbit is reported to show necrosis or corrosiveness on skin.
Serious eye damage or irritation	It has critical pungent in the case of animal experiment – concerned serious eye damage.
Respiratory hypersensitivity	No data available
Skin hypersensitivity	No data available
Specific target organ toxicity(single exposure)	causes irritation from nose, neck, organs of animal and human.
Specific target organ toxicity(repeated exposure)	Irritating human lung. Influence leukocyte count, erythrocyte floor space index value and make hemolysis.
Germ cell mutagenicity	Negative in micro-nucleus experiment conducted to mouse.
Genetic toxicity	Affects human sperm in a test tube experiment. Effect on sperm mobility in male animals and estrous cycle in female animals, resulting in birth disorders and weight loss in young animals-raising concerns about bad effect on reproductive ability or fetus.
Carcinogenicity	
IARC	3, not carcinogenic substance
ACGIH	A4, not carcinogenic substance
Aspiration hazard	No data available

## 12. Ecotoxicity effects

A. Ecotoxicity effects	
Fish	LC50 155 mg/l 24 hr
Crustacean	EC50 2.4 mg/l 48 hr (cyclops)
Bird	EC50 2.5 mg/l 72 hr
B. Persistence and degradability	
Persistence	No data available
Degradation	No data available
C. Bioaccumulative potential	
Condensability	When 5 w/v % is orally administered to a male mouse(Wister family), 56.2 mg/kg(liquid measure 0.112 ml/100g) of aqueous solution of hydrogen peroxide has no effect.
Biodegradability	known to be decomposed by enzyme catalysts within human body.
D. Mobility in soil	No data available
E. Other hazards	No data available

## 13. Disposal consideration

A. Disposal method	Should be disposed of in accordance with laws about toxicants and the Dangerous Goods Safety Management Act
	Before disposing of liquid waste, dilute it with plenty of water.
B. matters that require attention in disposal	Should be disposed of in accordance with applicable regulations.
	Do not absorb with combustible materials such as sawdust.

#### 14. Transport Information

<ul style="list-style-type: none"> <li>- U.S. Department of Transportation (DOT)</li> <li>- International Maritime Organization (IMDG)</li> <li>- International Civil Aviation Organization (ICAO)</li> <li>- International Air Transport Association (IATA)</li> </ul> <p>Classification regulations of above authorities are unified under the UN 'Recommendation on the Transport of Dangerous goods under UN Model Regulations'</p>	
<b>This product is classified as dangerous goods under UN model Regulations as below</b>	
A. UN No.	2014
B. Proper UN Shipping name	Aqueous solution of hydrogen peroxide
C. Hazard Class in Transport	5.1 (8)
D. Packing group	II
E. Marine pollutant	not applicable
F. Special safety measures that is necessary for users to know relating with transporting or transportation	
Emergency measures in case of fire	F - H
Emergency measures in case of release	S - Q

#### 15. Regulatory Information

Regulations by the Industrial Safety and Health Act	<p>listed as a substance of which working environment monitoring is necessary. (measurement cycle: 6month)</p> <p>listed as a hazardous substance that should be managed.</p> <p>listed as a substance of which exposure standards should be established.</p>
Regulations by the Safe Chemicals Act	toxic
Regulations by the Dangerous Goods Safety Management Act	6th category, oxidative liquid(if under 36wt%, categorized as nonhazardous substance)
Regulations by the Waste Management Act	Not the object of regulation
Regulations by national and foreign laws	
U.S. regulations (OSHA )	7500 lb
U.S. regulations(CERCLA )	Not applicable
U.S. regulations(EPCRA 302 )	1000 lb
U.S. regulations(EPCRA 304 )	1000 lb
U.S. regulations(EPCRA 313 )	Not applicable
U.S. regulations(Material of Rotterdam agreement )	Not applicable
U.S. regulations(Material of stockholm convention)	Not applicable
U.S. regulations(Material of Montreall Agenda)	Not applicable
EU category information(confirmed result)	R50; R8C; R35Xn; R20/22
EU category information(hazard label)	R5, R8, R20/22, R35
EU category information(safety label)	S1/2, S17, S26, S28, S36/37/39, S45

## 16. Other information

A. Reference	
<p>KOSHA MSDS information service <a href="http://www.kosha.net">Http://www.kosha.net</a>            Croner's: Dangerous Substances.            Sax's Dangerous Properties of Industrial Materials, 12th Ed.            National Institute of Technology and Evaluation, Japan <a href="http://www.safe.nite.go.jp">http://www.safe.nite.go.jp</a>            HSNO CCID, New Zealand <a href="http://www.ermanz.govt.nz/hs/compliance/chemicals.html">http://www.ermanz.govt.nz/hs/compliance/chemicals.html</a>            EU Directive 1999/45/EC            EU Directive 67/548/EEC            European Chemical Substances Information System <a href="http://ecb.jrc.ec.europa.eu/esis/">http://ecb.jrc.ec.europa.eu/esis/</a>            EUN Recommendations on the Transport of Dangerous Goods-Model Regulations 16th Ed.            TOXNET, U.S. National Library of Medicine <a href="http://toxnet.nlm.nih.gov">http://toxnet.nlm.nih.gov</a>            ECOTOX Database, EPA <a href="http://cfpub.epa.gov/ecotox">http://cfpub.epa.gov/ecotox</a>            IMDG Code 2008 edition (Amendment 34-08), IMO</p>	
B. Preparation Date	June 1, 1996.
C. The number of revision and date of the last revision	
The number of revision	6
Date of the last revision	Mar 30, 2013.
D. Notice	
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