

TO: Yee Lee Industrial Chemical Limited

MATERIAL SAFETY DATA SHEET (MSDS)

Created: May 6, 1998

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SECTION 1: PRODUCT INFORMATION

PRODUCT NAME: Copper Sulfate
CHEMICAL NAME: Copper (II) Sulfate Pentahydrate
INGREDIENTS AND COMPOSITION: Copper sulfate pentahydrate 98.5% or more
Iron 0.1% or less
Water-insoluble material 0.05% or less
CHEMICAL FORMULA: $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
CAS NUMBER: 7758-99-8
UN CLASSIFICATION: Environmentally hazardous substance, solid
UN NUMBER 3077 (Class 9)

SECTION 2: COMPANY IDENTIFICATION

Onahama Smelting and Refining Co., Ltd.

Onahama Division

Risk Management Department

Quality Inspection and Development Sect

1-1 Nagisa, Onahama, Iwaki-Shi, Fukushima, 971-8101, Japan

PHONE: +81-246-54-4841
FAX: +81-246-53-3951
EMERGENCY PHONE: +81-90-7322-5115

SECTION 3: HAZARDS IDENTIFICATION

GHS CLASSIFICATION

Physical Hazards:

Explosives: Out of classification
Flammable gasses: Out of classification
Flammable aerosols: Out of classification

Oxidizing gasses:	Out of classification
Gasses under pressure:	Out of classification
Flammable liquids:	Out of classification
Flammable solids:	Not classified
Self-reactive substances and mixtures:	Not classified
Pyrophoric liquids:	Out of classification
Pyrophoric solids:	Not classified
Self-heating substances and mixtures:	Not classified
Substances and mixtures which, in contact with water, emit flammable gasses:	Not classified
Oxidizing liquids:	Out of classification
Oxidizing solids:	Unable to be classified
Organic peroxides:	Out of classification
Corrosive to metals:	Unable to be classified

Health Hazards:

Acute toxicity (Oral):	Category 4
Acute toxicity (Dermal):	Unable to be classified
Acute toxicity (Gases):	Out of classification
Acute toxicity (Vapours):	Unable to be classified
Acute toxicity (Dusts and mists):	Unable to be classified
Skin corrosion/irritation:	Category 2
Serious eye damage/eye irritation:	Category 2A/2B
Respiratory sensitization:	Unable to be classified
Skin sensitization:	Category 1
Germ cell mutagenicity:	Category 2
Carcinogenicity:	Unable to be classified
Reproductive toxicity:	Category 2
Specific target organ toxicity – Single exposure:	Category 1 (nerve system, kidney, respirator apparatus, blood system, and liver.)
Specific target organ toxicity – Repeated exposure:	Category 2 (liver)

Category 1 (nerve system, kidney, respirator apparatus, blood system)

Aspiration hazard: Unable to be classified

Environmental Hazards

Hazardous to the aquatic environment

Acute toxicity: Category 1

Chronic toxicity: Category 1

LABEL ELEMENTS

Pictorial Indication or Symbol: Out of classification of GHS



Hazard Statements:

DANGER

Hazard Information:

Harmful to ingest
Skin irritation
Vigorous eye irritation
Possibility to cause allergic skin reaction
Possibility to cause genetic disorder
Possibility of adverse effects on reproductive competences or fetuses
Disorders of organs (blood systems, liver, nerve system, kidney, and respiratory apparatus)
Disorders of organs (blood systems, kidney, and respiratory apparatus) by long or repeated exposures
Risk of disorder of organs (liver) by long or repeated exposures

Hazard Notes:

Safety Measures:

Do not use it before grasping the entire notices for safety.
Wear appropriate protective gloves and glasses.
Use the protective equipment which is necessary.
Keep the polluted wear away out of the working

	place.
	Enforce washing eyes and hands.
Emergency Procedures:	In case of ingestion, rinse the mouth with water, and if the condition is not going well, consult the doctor.
	In case of eye contact, flush the eye with water for good minutes, and remove contact lenses if they are easily to be removed, and keep on flushing. If having eye irritation, see the doctor.
	If it occurs to be a skin contact, wash it off with plenty of water and soap. If having simulated or coming out in any rash, see the doctor.
	Wash the hands after having any use of this product.
	Wash up the polluted clothing before using again.
	If it occurs that the conditions are getting worth, consult the doctor.
	Sweep and collect the leaked dust.
	Cool the surroundings not to heat because of the risk of generation of toxic fume (sulfur dioxide) by ignition.
Storage:	Store the products to the lockable site.
	Storage area should be prevented from rain water.
Disposal:	If there are industrial waste disposers qualified by local or federal governments, delegate the products to them.
Local/Federal Information:	

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with clear water for at least 15 minutes, and get medical attention. Check for and remove any contact lenses if they are easily taken off.

SKIN CONTACT: Flush skin with water or lukewarm water, and wash it out with soap.

INHALATION: Blow and gargle victim's nose. Remove her/him to the place which has clean air. If s/he is not breathing or is difficult to breathe, give artificial respiration after loosening clothing and maintaining airway.

INGESTION: Irrigate stomach with lukewarm water or with concentrated salt water. Give protein water (3 or 4 egg whites in a liter of water) or milk.

PREDICTED ACUTE SYMPTOMS AND LATE SYMPTOMS:

Skin Contact: red flare
Eye Contact: red flare, pain
Ingestion: stomachache, dizziness, headache, nausea

THE MOST IMPORTANT SIGNS AND SYMPTOMS:

SECTION 5: FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:

Dry chemical

PARTICULAR HAZARDS:

Does not burn and not support combustion, but may emit toxic fumes (sulfur dioxide).

PARTICULAR FIRE FIGHTING MEASURES:

Toxic fumes may be generated, so cool the surroundings in order not to be heated.

PROTECTIONS FOR FIREFIGHTERS:

Firefighters should be equipped with protective gears. Evacuate the unauthorized people from the fire site.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PRECAUTIONS FOR HUMAN PROTECTIVE EQUIPMENTS

AND EMERGENCY MEASURE:

Do not touch the leakage without the protective equipments.

Quarantine the appropriate extent as a leakage site. From there keep away the unauthorized people.

Workers should wear the appropriate protective gears, and avoid eye or skin contact or inhalation of gas or dust (see SECTION 8).

Keep being the windward and away the people who are leeward.

When cleaning the leakage inside the room, make there well ventilated.

PRECAUTIONS ABOUT SURROUNDINGS

Pay attention not to leak the products to river. Do not discharge to the surroundings.

RECOVERY AND NEUTRALIZATION:

Sweep and collect the leakage, retrieve it to empty containers, and discard it afterward.

Flush the leaked site fully with water.

CONTAINMENT AND CLEANUP:

Stop leakage if it is not dangerous.

EQUIPMENTS:

PREVENTATIVE MEASURES OF SECONDARY DISASTER:

Immediately remove any sources of ignitions. (Do not smoke or use fire.)

SECTION 7: HANDLING AND STORAGE

HANDLING INFORMATION:

Technical Actions: Take facility measures described in SECTION 8, and wear protective gears.

Local ventilations and entire ventilations:

As described in SECTION 8, install local exhaust ventilations and take measures of general ventilations.

Safety Precautions: Get necessary information beforehand.

Do not use before grasping all safety precautions.

Wear protective gears.

Ventilate well in case of using indoors.

Do not touch, inhale, and ingest.

Be careful not to get it into eyes.

Wash hands thoroughly after using the product.

Use only outside rooms or in well-ventilated places.

Do not eat, drink or smoke where this product is handled.

Avoid emitting to the surroundings.

Avoiding Contact: See SECTION 10

STORAGE INFORMATION:

Technical Actions: Store in a locked place. The place should be kept liquid out.

In the stock place, prepare the facilities that can ventilate and can provide good daylight for using the product.

Conditions of Storage:

Store this product apart from such sources of ignition as heats, sparks

and naked flame.

Store the containers, which are sealed off, in the well-ventilated and cool place. They also need to be stored in the place where be put in direct sunshine.

Mixed Touch Hazardous Substance:

See SECTION 10.

Containers and Packing Materials:

SECTION 8: EXPOSURE CONTROLS/ PERSONAL PROTECTION

MANAGED CONCENTRATION:

Not be established as evaluation standards for working condition.

ACCEPTABLE CONCENTRATION (COMPONENT EXPOSURE LIMITS):

ACGIH: 0.2mg/m³ TLV-TWA (fume)

1mg/m³ TLV-TWA (dusts & mists)

OSHA: Not be established.

MEASURES ON FACILITIES:

When using it inside a room, seal off the place which has ability to be exposure, or install with local ventilation equipments.

Install safety showers and hand-wash and eyewash stations. These facilities are easily to be found.

Dust discharging places should be sealed off, or local ventilation facilities should be installed.

PROTECTIVE EQUIPMENTS:

Protective Equipments for Respiratory Apparatus:

Wear appropriate respiratory protective equipments.

Protective Equipments for Hands:

Wear appropriate hand protectors.

Protective Equipments for Eyes:

Wear appropriate protective eyewear.

Eye protectors (normal glasses type, normal glasses type with side plates, goggle type)

Protective Equipments for Skins and Bodies:

Wear protective equipments such as protective clothing, protective shoes, etc.

Hygiene Measure:

Wash hands well after treating the product.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Blue crystal or crystalline powder.
ODOR:	Not available
pH:	Not available
MELTING POINT:	Not available
BOILING POINT:	Not available
BURNING POINT:	Not available
EXPLOSIVE RANGE:	Not available
VAPOR PRESSURE:	Not available
VAPOR DENSITY:	Not available
SPECIFIC GRAVITY:	d_4^{25} 2.29
SOLUBILITY:	Soluble in water (20°C 24.3g/100ml) Soluble in methanol
OCTANOL-WATER PARTITION COEFFICIENT:	Not available
SPONTANEOUS IGNITION TEMPERATURE:	Not available
DECOMPOSITION TEMPERATURE:	Not available
ODOR THRESHOLD:	Not available
EVAPORATION RATE:	Not available
COMBUSTIBILITY:	Incombustible
VISCOSITY:	Not available

SECTION 10: STABILITY AND REACTIVITY DATA

CHEMICAL STABILITY: Stable (fade gradually in dry atmosphere).

HAZARD REACTION POSSIBILITY:

If heated, sulfur dioxide may be generated.

CONDITIONS TO AVOID:

Application of heat.

MIXED-TOUCH HAZARDOUS SUBSTANCES:

Not available

HAZARDOUS DEGRADED PRODUCTS:

Not available

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY: Oral-rat LD₅₀: = 960mg/kg

Harmful to ingest.

SKIN CORROSION/IRRITATION:

Skin irritation.

SERIOUS EYE DAMAGE/EYE IRRITATION:

The case example of human epidemiology of ICSC (2001) shows its irritant property.

Vigorous eye irritation.

RESPIRATORY SENSITIZATION:

Not available

SKIN SENSITIZATION:

GERM CELL MUTAGENICITY:

Possibility of genetic disorder

CARCINOGENICITY: Unable to be classified.

REPRODUCTIVE TOXICITY:

Possibility of adverse effects on reproductive competences or fetuses

PARTICULAR TARGET ORGAN TOXICITY (SINGLE EXPOSURE):

Disorders of organs (blood systems, liver, nerve systems, kidney, and respiratory apparatus)

PARTICULAR TARGET ORGAN TOXICITY (REPEATED EXPOSURES):

Disorders of organs (blood systems, kidney and respiratory apparatus) by long or repeated exposures.

RESPIRATORY TOXICITY: Not available

SECTION 12: ECOLOGICAL INFORMATION

HAZARDOUS TO THE AQUATIC ENVIRONMENT

ACUTE TOXICITY: Severe toxicity on aquatic organisms

CHRONIC TOXICITY: Longer and severer toxicity on aquatic organisms

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE FROM RESIDUES: All wastes must be handled in accordance with local, state and federal regulations. If there are industrial waste disposers qualified by local or

federal governments, delegate the disposals to them.

In case of delegating the disposals, inform the danger and toxicity to the disposers.

CONTAMINATED VESSELS AND PACKAGES:

Contaminated vessels should be disposed appropriately in accordance with related laws and local regulations.

In case of disposing empty vessels, remove completely the contents.

SECTION 14: TRANSPORT INFORMATION

INTERNATIONAL REGULATIONS

Maritime Regulations: Abide by the regulations on IMO

Aerial Regulations: Abide by the regulations on ICAO/IATA

DOMESTIC REGULATIONS

Ground Regulations: Comply with the "Poisonous and deleterious substance control law"

Maritime Regulations: NOT corresponds to hazardous substance of UN category.

Aerial Regulations: NOT corresponds to hazardous substance of UN category.

SPECIAL SAFETY PRECAUTIONS

Confirm the absence of leakage. Load products unless they fall or are damaged.

Ensure the prevention from collapse of cargo.

During the transportation, be cautious not to generate sources of ignition such as fire, static electricity, spark, and high-temperature substances.

Do not transport with foods or feedstuff.

Do not load heavy goods on the top of the products.

Need to have the yellow card.

Follow SECTION 7 in addition to general precautions.

Comply with the related laws and regulations.

SECTION 15: OTHER REGULATORY INFORMATION

POISONOUS AND DELETERIOUS SUBSTANCE CONTROL LAW:

The industrial copper sulfate corresponds to No.94 in attached table 2 of Poisonous and Deleterious Substance Control Law. The industrial copper sulfate classified into "Deleterious substance" of Article 2 in "Cabinet order of the Poisonous and Deleterious Substance", and corresponds to No.72 in "copper compounds, inorganic".

PHARMACEUTICAL AFFAIRS LAW :

The industrial copper sulfate is classified into "Inorganic medicine and the drug product" of " Deleterious Medicine " in attached table 3 by " Ordinance for enforcement of the Drugs, Cosmetics and Medical Instruments ", and corresponds to No18 in that "Copper salts, colloid copper, and the drug product"

INDUSTRIAL SAFETY AND HEALTH LAW:

The industrial copper sulfate corresponds to "notifiable substances" provided in Article 57-2 of Industrial Safety and Health Law. The notifiable substances are provided in Articles 18-2 of the Enforcement Order of the Industrial Safety and Health Law, and it is described in attached table 9. The industrial copper sulfate corresponds to "Copper and its compounds" of No.379 in attached table 9.

ACT ON CONFIRMATION, ETC. OF RELEASE AMOUNTS OF SPECIFIC Chemical Substances IN THE ENVIRONMENT AND PROMOTION OF IMPROVEMENTS TO THE MANAGEMENT THEREOF: (Hereafter, it is said the PRTR system.) :

The industrial copper sulfate corresponds to "No.207, copper salts (water-soluble ,except complex salts) " of " Class I Designated Chemical Substance " provided to Article 2 of " PRTR system ".

SECTION 16: OTHER INFORMATION**AUTHOR INFORMATION:**

Onahama Smelting and Refining Co., Ltd. Onahama Division.

Phone Number: +81-246-54-4841

Facsimile Number: +81-246-53-3951

BIBLIOGRAPHY

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- 2) "Kashinhou Kizon Kagaku Busshitsu Hand Book (ver. 4)", *Kagaku-Kogyo- Nippou-sya*(1989)
- 3) "Kiken-butsu Sen-paku Un-so Oyobi Tyozou-kisoku", *Kaibundo*(1991)
- 4) "GHS Bunrui Manual", *GHS Kankei-syouchou Rennraku-kaigi*(2006)
- 5) "ICSC(J)" (2001)
- 6) "ACGIH"(2004)
- 7) "Kagaku Dai-jiten" *Kyo-ritsu Syuppan*
- 8) "Shiyaku Guide"(1992)
- 9) "Gekidokubutsu Kijyun Kankei Tsuuchi-syo"(1991)
- 10) "Aneihou Kagaku Busshitsu"(1991)
- 11) "Anzen Eisei jyouou Center" <http://www.jaish.gr.jp/index.html>

This Materials Safety Data Sheet is provided for businesses as reference information in order to confirm the safe handling of hazardous chemical products. The information described above is correct at present time. However, the evaluations for danger or toxicity are not necessarily perfect. They can be revised by new aspects. Businesses handling this product should refer to this MSDS with understanding that they need to adopt appropriate measures under their own responsibility. Therefore, this data sheet itself is not safety certification of this product.
