

Ministry of Employment and Labor	물질안전보건자료 (Material Safety Data Sheet)	KOSHA
		AA01219-0000000003

1. Products and Manufacturer

A. Products	OXYGEN FREE COPPER(C10200)
B. Used for and limit for the use	
Used for	Supplier of copper ion in the process of printed circuit board
limit for the use fo product	N/D
C. Manufacturer Infomation	
	supplier
Company	DAECHANG CO.,LTD.
Address	(15076) 391, Gongdan 1-daero, Siheung-si, Gyeonggi-do, KOREA
Contact No.	314963000
	manufacturer
Company	TAEWOO Co.,LTD.
Address	133, Sihwaro, Danwon-gu, Ansan-si, Gyeonggi-do, KOREA
Contact No.	03180858000

2. Hazards Identification

A. Hazards.Risk Classification
Acute toxicity(oral) : classification4
Skin sensitization : classification1
Specific Target Organ Toxicity (Single Exposure) : classification 3-respiratory tract irritation
Acute aquatic environment Maleficence : classification 1
Chronic aquatic environment Maleficence : classification 3

B. Level elements including precautionary statements

Symbol



Signal Word

Risk

Hazards.Risk
Statement

H302 Harmful if swallowed

H317 : May cause an allergic skin reaction.

H335 May cause respiratory irritation

H400 Very toxic to aquatic life

H412 Harmful to aquatic life with long-lasting effects

Precautionary
Statement

Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash...thoroughly after handling.

P270 Do not eat, drink or smoke when using this

P271 Use only outdoors or in a well-ventilated area

P272 : Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment

P280 : Wear protective gloves/protective clothing/eye protection/face protection/hearing

Response

P301+P312 IF SWALLOWED: Get medical help

P302+P352 : IF ON SKIN: Wash with plenty of water

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 Call a POISON CENTER/doctor if you feel unwell.

P321 : Specific treatment

P330 Rinse mouth

P333+P313 : If skin irritation or rash occurs: Get medical advice/attention.

P362+P364 : Take off contaminated clothing and wash it before reuse.

P391 Collect spillage

Storage

P403+P233 Store in well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Disposal

P501 Dispose of contents in accordance with regulation(to be specified)

C. Other Hazard.Risk Which are not included in the classification criteria (e.g. dust explosion hazard)

N/D

3. Composition/Information on ingredients

Chemical Name	Other name	CAS number or Other identification number		Content(%)	
		CAS No.	identification number	range	single
Copper	N/D	7440-50-8	N/D	99.95-100	N/D

4. First aid measures

A. Eye contact

Get emergency medical help immediately

Rinse skin and eyes with water that flows for at least 20 minutes upon contact with the substance.

B. Skin contact

Isolate contaminated areas by removing contaminated clothing and shoes.

Immediately wipe off any material on the skin at the time of contact and wash the skin with running water for at least 20 minutes.

Get emergency medical help immediately

C. Inhalation

If you have difficulty breathing, supply oxygen.

Get emergency medical help immediately

If not breathing, give artificial respiration.

If exposed to excessive dust or fumes, remove with clean air and get medical attention if cough or other symptoms develop.

D. Ingestion

IF SWALLOWED: Get medical help

Rinse mouth.

E. Indication of immediate medical attention and notes for physician Ingestion

Ensure that medical personnel are aware of the substance and take protective action.

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media

Use alcohol foam, carbon dioxide or water spray to extinguish fires associated with this substance.

Use dry sand or soil for extinguishment by smothering.

B. Specific hazards arising from the chemical (e.g. nature of any hazardous combustion products)

Can be ignited by friction, heat, sparks, flames

Dust, fume can form air and explosive mixtures.

It can generate irritating, corrosive and toxic gases in the event of a fire.

Container may explode when heated.

Can be reignited even after extinguishing

C. Special protective equipment and precautions for fire-fighters

Extinguish a fire while maintaining a safe distance after leaving the area.

Be careful as some are transported as flammable liquids.

If it is not dangerous, move the container out of the fire area.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Stop the leak if it is not dangerous.

Wipe off any spills immediately and follow all protective precautions.

Note the substances and conditions to avoid

Do not touch or walk on Leaked substances.

Eliminate all sources of ignition

B. Environmental precautions and protective procedures

Prevent entry into waterways, sewers, basements and confined spaces.

C. Methods and materials for containment and cleaning up

Absorb liquid and rinse contaminated area with detergent and water.

Absorb spillage with inert materials (eg dry sand or earth) and place in a chemical waste container.

7. Handling and storage

A. Precautions for safe handling

After handling, thoroughly rinse the handling area.

Use only outdoors or in a well-ventilated area.

B. Conditions for safe storage (including any incompatibilities)

Keep away from food and drink.

Attention to substances and conditions to avoid.

B. Conditions for safe storage (including any incompatibilities)

Empty drums should be completely drained, properly closed and then immediately returned to the drum adjuster or placed properly.

keep tightly closed

8. Exposure controls & personal protection

A. Control parameters (e.g. occupational exposure limit values, biological limit values)

Domestic regulations Copper – TWA : 0.1 mg/m³ , STEL : –

ACGIH Copper – TWA : TWA : 0.2 mg/m³ , STEL : N/D

biological exposure
standard Copper – N/D

Other exposure
standards Copper – N/D

B. Appropriate engineering controls

Equipment for storing or using this substance should be equipped with a cleansing facility and a safety shower.

If dust, fume, or mist is generated while driving, ventilate to keep air pollution below the exposure standard.

C. Personal protective equipment

respiratory protection Wear respirators that are certified by the Korea Occupational Safety and Health Agency that match the physicochemical properties of the exposed material.

Eye protection N/D

Hands protection Wear suitable chemical resistant gloves.

Body protection Wear suitable chemical resistant protective clothing.

9. Physical and chemical properties

Composition	division		detail
Copper	A. Appearance	physical state	solid
		color	copper color
	B. Odour		Odorless
	C. Odour threshold		N/D
	D. pH		N/D
	E. Melting point/freezing point		about 1059 °C
	F. Initial boiling point and boiling range		2595 °C
	G. Flash point		N/D
	H. Evaporation rate		N/D
	I. Flammability (solid, gas)		not flammable
	J. Upper/lower flammability or explosive limits		N/D
	K. Vapor pressure		7.5 nanopascal (20°C)
	L. Solubility		< 1 mg/ℓ (30°C)

Copper	M. Vapor density	N/D
	N. Relative density	약 8.78 g/cm ³ (20℃)
	O.Partition coefficient: n-octanol/water	-0.57 (estimate)
	P. Auto-ignition temperature	1059 ℃
	Q. Decomposition temperature	N/D
	R. Viscosity	N/D
	S. Molecular mass	63.546

10. Stability and reactivity

A. Chemical stability and possibility of hazardous reactions

Can be ignited by friction, heat, sparks, flame

Can be reignited even after extinguishing.

Dust, fume can form an explosive mixture with air.

Reacts violently and explosively with water.

Container may explode on heating

May generate irritating, corrosive and toxic gas in the event of a fire.

B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)

heat

Friction, heat, sparks, flame

C. Incompatible materials

water

D. Hazardous decomposition products

Irritating, corrosive and toxic gases

11. Toxicological information

A. Information on the likely routes of exposure

Product	N/D
Copper	

B. Health hazards information

Acute toxic	Oral	Product	N/D
		Copper	LD50 300 ~ 500 mg/kg Rat
	Percutaneous	Product	N/D
		Copper	LD50 > 2000 mg/kg Rat
	Inhalation	Product	N/D
		Copper	gas LC50> 5.11 mg/ℓ 4 hr Rat
Skin corrosive/ irritant	Product		N/D
	Copper		Edema score: 0/0, No irritation, Rabbit, OECD TG 404
Serious eye damage/ eye irritation	Product		N/D
	Copper		Slightly irritating, rabbit, corneal opacity (1), iris (0.6), conjunctival hyperemia (1.8), chemosis (1.1), completely reversible within 14 days, OECD TG 405
Respiratory sensitization	Product		N/D
	Copper		N/D
Skin sensitization	Product		N/D
	Copper		Skin Sensitizer Group 2 (Copper and Its Compounds) (Japanese Society of Industrial Hygiene)

Carcinogenicity	IARC	Product	N/D
		Copper	N/D
	NTP	Product	N/D
		Copper	N/D
	OSHA	Product	N/D
		Copper	N/D
	ACGIH	Product	N/D
		Copper	N/D
	Industrial Safety and Ministry of Labor	Product	N/D
		Copper	N/D
EU CLP	Product	N/D	
	Copper	N/D	
Germ Cell Mutagenicity		Product	N/D
		Copper	in vitro – Restoration mutation test using bacteria: negativeness(S. typhimurium Strains TA98, TA100, TA1535, TA1537, TA102, Regardless of metabolic activity system), OECD TG 471
Reproductive toxicity		Product	N/D
		Copper	LO(A)EL : Parent male: No effect up to 1500ppm. No reproductive toxicity was observed at any concentration. Parent female: 1500 ppm (reduction of spleen weight in P1 adult female). No reproductive toxicity was observed at any concentration. F1 male: 1500 ppm (decrease in spleen weight in F1 male generation). No reproductive toxicity was observed at any concentration. F1 females: 1500 ppm (reduced spleen weight in F1 female generation). No reproductive toxicity was observed at any concentration. F2 male: 1500 ppm (reduction of spleen weight in F2 male generation).F2 females: 1500 ppm (decreased spleen weight in the F2 female generation).NO (A) EL : Parent male: 1500 ppm. For pregnant P1 males, it corresponds to 23.6 mg / kg bw / day. Parent female: 1000 ppm. No reproductive toxicity was observed at any concentration. For P1 females during the first 2 weeks of gestation, pregnancy and lactation, correspond to 19.1, 17.0 and 33.8 mg / kg bw / day, respectively. F1 Male: 1000ppm. No reproductive toxicity appeared at any concentration. The effect appeared in the F1 generation. (See more information on adult mg / kg bw / day results at 1000 ppm.) F1 female: 1000ppm. No reproductive toxicity was observed at any concentration. The effect appeared in the F1 generation. (See additional information on 1000 ppm adult mg / kg bw / day results.) F2 male: 1000ppm. No reproductive toxicity was observed at any concentration. The effect appeared in the F2 generation. (See more information on adult mg / kg bw / day results at 1000 ppm.) F2 female: 1000ppm.

		No reproductive toxicity was observed at any concentration. The effect appeared in the F2 generation. (See additional information on 1000 ppm adult mg / kg bw / day results.) , EPA OPPTS 870.3800, GLP No evidence of test substance-related teratogenicity, Maternal toxicity LO(A)EL = 9 mg Cu/kg bw/day, Maternal toxicity NO(A)EL = ? 6 mg Cu/kg bw/day, developmental toxicity LO(A)EL = ? 9 mg Cu/kg bw/day, developmental toxicity NO(A)EL = ? 6 mg Cu/kg bw/day, rabbit, OECD TG 414, GLP
Specific target organ toxicity (single exposure)	Product	N/D
	Copper	
Specific target organ toxicity (repeated exposure)	Product	N/D
	Copper	oral: In individuals treated with 2000 mg / kg bw, systemic signs were bending posture, apathy, naps, diarrhea, slowed breathing, dyspnea, ataxia, pale limbs, hair growth, toe walking, and The stool turned green. Bending postures were recorded on the day of administration and 1 day after administration in one animal treated with 200 mg / kg bw. No other signs of systemic signs were observed in individuals treated with 200 mg / kg bw. At necropsy of an individual treated with 2000 mg / kg bw that died during the study, abnormally red lungs, dark liver, dark kidneys, copper-colored substances present on, hemorrhagic gastric mucosa, epithelium on the twist of the nasal glands And hemorrhagic small intestine and colon appear. No abnormalities were observed at necropsy of individuals treated with 200 mg / kg bw(Rat / Male / Female / OECD TG 423 / GLP) Inhalation: 1Inhalation exposure to copper powder KU 7600 standard material at a concentration of 1.24 or 5.11 mg / L for 4 hours causes severe ataxia with mild sign-related symptoms, slight progression with mild symptoms and mild dyspnea (volume). (Respiratory rate decrease with increase) Immediately after the end of exposure, all animals on the first day of the test for 3 hours or up to the 4th day of the test (3 males and 3 females, respectively). In addition, it was observed that motility was reduced in all animals at 5.11 mg / L 2-4 days after exposure. Two males with a dose of 1.24 mg / L or at a dose level of 5.11 mg / L, dark or slightly gray-stained discolored lungs were observed in one male and one female (rats). / Male / Female / OECD TG). 436 / GLP)
Aspiration hazard	Product	N/D
	Copper	N/D

12. Ecological information

A. Aquatic and terrestrial ecotoxicity

fish	Product	N/D
	Copper	LC50 193 $\mu\text{g}/\ell$ 96 hr Pimephales promelas (Running water type, fresh water)
crustaceans	Product	N/D
	Copper	LC50 7.2E-5 ~ 5.36 mg/ℓ 48 hr Crustaceans (median: 0.044 mg/ℓ)
bird	Product	N/D
	Copper	NOEC 30 $\mu\text{g}/\ell$ 7 day Lemna minor (Water-stop type, fresh water)

B. Persistence and degradability

Persistence	Product	N/D
	Copper	-0.57 log Kow(estimate)
degradability	Product	N/D
	Copper	N/D

C. Bioaccumulative potential

bioaccumulation	Product	N/D
	Copper	N/D
biodegradability	Product	N/D
	Copper	N/D

D. Mobility in soil

Product	N/D
Copper	N/D

E. Other adverse effects

Product	N/D
Copper	N/D

13. Disposal considerations

A. Disposal method

If it is stipulated in the Waste Management Law, dispose of the contents and containers according to the stipulation.

B. Disposal precaution (including the disposal method of contaminated container and packaging)

Dispose of contents/container to Waste Management Act

14. Transport information

A. UN number

N/D

B. UN proper shipping name

N/D

C. Transport hazard class

N/D

D. Packing group (if applicable)

N/D

E. Marine pollution (yes/no)

no

F. Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises

Emergency measures in case of fire

N/D

Emergency measures in case of spill

N/D

15. Regulatory information

A. Industrial Safety and Health Act

working environment measurement substance (measurement cycle : 6 months)

Hazardous Substances Requiring Management

exposure standard setting substance

B. Toxic Chemical Control Act

N/A

C. Dangerous Material Safety Control Act

N/A

D. Wastes Management Act

Designated Waste

E. Other requirements in domestic and other countries

Domestic regulation N/A

Other domestic regulation N/D

16. Other information

A.Information source and references

9. Physical and chemical properties : physical state,color, Melting point/freezing point,I. Flammability (solid, gas),Vapor pressure,Solubility,Vapor density,Auto-ignition temperature,(ECHA), Initial boiling point and boiling range,Relative density,Molecular mass(HSDB),Partition coefficient: n-octanol/water(Kow)(EPISUITE)

Toxicity information: Health hazard information (acute toxicity (oral, dermal, inhalation), skin corrosion or irritation, severe eye damage or irritation, germ cell mutagenicity, reproductive toxicity, specific target organ toxicity) (Single exposure) Specific target organ toxicity (repeated exposure), (ECHA), Skin hypersensitivity (NITE)

12. Environmental Impact: Ecotoxicity (fish, crustaceans, bird) (ECHA)

B. Issuing date

2013-01-07

C. Revision number and date

Revision No.	9	Revision date	2026-01-21
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d) others :

N/D