

WONIL	Material Safety Data Sheet
Wonilsa MSDS No : 0009 Revision No : 4 (Standard of GHS)	Revision Data : 01/10/14
Product name	OXYGEN FREE WITH Ag COPPER

SECTION 1 Information of company and chemical products

1. Product name OXYGEN FREE WITH Ag COPPER
- Standard of goods C1040
2. Recommendation and limit of use for product
- The use of recommendation Electricity, Electricity parts etc.
- Limit of use No data
3. Manufacturer/Importer/Distribution dealer information
- Company name WONIL CO.,LTD
- Address 602-22, 647 Sunggok-Dong, Danwon-Gu, Ansan, Kyunggi-Do, Korea
- Contact TEL: 031) 491 - 2891 / FAX: 031) 491 - 5012
- Responsibility Department Quality Management Dpt.

SECTION 2 Hamfulness·Dangerousness

1. Classification of Hafulness, Dangerousness
- Specific target extended toxicity (Once Exposure) : Division 3- Respiratory organ Stimulation,
- Divisoins 1 (Ag) Specific target extended toxicity (Repeated Exposure) : Division 1
- Acute aquatic environment hamfulness : Division 1
- Chronic aquatic environment hamfulness : Division 1
- Skin hypersensitivity : Division 1 (Ag)
2. Warning signs Item includes prevention measure words

Pictorial symbol



Signal words	Danger
Harmful, dangerous Words	<p>H370 It can cause respiratory organ stimulation</p> <p>H317 It can cause allergic skin response (Ag)</p> <p>H372 It causes liver damage from long period and repeated exposure</p> <p>H400 Highly toxic for aquatic organisms</p> <p>H413 Highly toxic for aquatic organisms by long period effect</p>

Prevention measure words

Prevention	<p>P260 Do not breathe Dust · Fume.</p> <p>P261 Avoid to breathe (Dust · Fume · Gas · Mist · Steam · Spray).</p> <p>P264 After treatment, wash your hands thoroughly.</p> <p>P270 Do not eat, drink, and smoke when you use this products.</p> <p>P272 Do not take out polluted clothes from outsides the workplace. (Ag)</p> <p>P280 Wear (hand protection · protective clothing · goggles · face mask). (Ag)</p>
------------	--

Action	<p>P302+P352 Wash your skin with soap and much water if dust gets on skin. (Ag)</p> <p>P304+P340 Move to place where there is fresh air and take a rest with comfortable posture if you breath dust.</p> <p>P312 If you feel uncomfortable, consult a doctor(Medical institution).</p> <p>P314 If you feel uncomfortable, ask for medical action and advice.</p> <p>P333+P313 If skin irritation or erythema is appeared, ask for medical action and advice. (Ag)</p> <p>P363 Wash polluted clothes before use it again. (Ag)</p>
Save	<p>P403+P223 Save it as covering tightly with wrap to a well-ventilated place.</p> <p>P405 Save it to place with securing means. (Ag)</p>
Disuse	P501 Discard contents (Following Waste Control Act) discard contents and containers.

3. Other harmful, dangerousness (NFPA) which is not included in standard of harmful, dangerousness

Division	Health care	Fire	Reactivity
Copper	2	3	0
Ag	No data	No data	No data

SECTION 3

Title and content of Constituent

Material Name	Usual name	CAS No.	content (%)
Copper	-	7440-50-8	99.943 ~ 99.973
Ag	silver atom	7440-22-4	0.0270 ~ 0.0340

SECTION 4

Emergency Action Knack

1. When Dust(Fume) comes into your eye	<p>Wash your eye with much water over 15 minutes if your eye contact chemicals. Get emergency medical service. (Ag)</p> <p>Consult a doctor's medical examination and treatment immediately, if chemicals comes into your eye.</p>
2. When Dust(Fume) contact your skin	<p>Wash your skin with soap water over 15 minutes immediately and remove chemicals. Prevent spread of polluted part when you get light skin contact.</p> <p>If skin irritation or erythema is appeared, ask for medical action and advice. (Ag) If skin disease is occurred, consult a doctor's medical examination.</p>
3. When you breathe Dust(Fume)	<p>If there is no breathing, start artificial respiration. Move to place where there is fresh air.(Ag)</p> <p>If you are exposed, consult a doctor's medical examination. (Ag) Walk away from Source of exposure.</p>
4. When you eat Dust(Fume)	<p>If people is insensible, avoid to vomit up and forbid all intake.</p> <p>When occur natural vomit, adopt a lower posture than behind of head to avoid possibility of breathe to lung.</p> <p>If people is insensible, prevent respiratory obstruction as turning the head.</p> <p>Call the 119 or Emergency medical treatment center and evacuate patient immediately.</p>
5. Other caution of a doctor	<p>Consider gastric lavage when you take in chemicals.</p> <p>Consider offering oxygen when people cannot breathe. Make medical manpower can recognize and protective action.(Ag)</p> <p>Antidote(Copper) : kalium, Natrium, Edetate/Glucose , Vein Injection: Penicillamine, oral administration.</p>

SECTION 5

Coping Method of Explosion and Fire

1. Proper(Improper) fire extinguish material

Proper extinguish material	<p>Dolomite , Dry chemical extingish material for Metal fire, Sand, Black lead, soda ash, sodium chloride , lime</p> <p>When extingish the material which is related with this, use alcohol foam, carbon dioxide or water spray.(Ag)</p>
Improper extinguish material	Direct water jet

When great fire is occurred	No data
-----------------------------	---------

2. Particular harmfulness from Chemical material

Pyrolysate	Lead oxide, Zinc oxide
Danger of Fire, Explosion	People can ignore danger of fire and explosion in common states. Mixture of Dust and Air can be exploded. Can generate toxic gas by decomposing at high temperatures. (Ag)

3. The protector and Prevention measure during suppression of fire

Protector	Fire suits
Prevention measure	Keep off related person and forbid to enter isolating danger place. Use extinguish material which is adjusted by round the fire. Avoid to breathe material if self or product of combustion. Do not contact water directly to material.

SECTION 6 Coping method during leakage accident

1. Matters of management and protector to protect body	Avoid direct contact and wear protection equipment. Do not touch your hand and contact to leak substance. Avoid to breathe Dust, Fume, Gas, Mist, Steam, Spray. (Ag)
--	--

2. Matters of management to protect environment

Atmosphere	No data
Soil	Dispose of leaked material moving suitable container. Prevent flow in water way, drain, basement, closed space. (Ag)
Under Water	Remove trapped material with absorption using exhaust hose. Do Adsorption treatment leaked material with activated carbon. Refuse leaked material using a machine.

3. Method of removal or purification

Small amount of material leak	Refuse leaked material to shitable containers for later disposal.
Large amount of material leak	Quarantine exposure place and control access except related person. Notice emission content to government ministry or local government when the material is emitted more than a standard amount. Remove all ignition source like Fire, Flare, Spark.

SECTION 7 Method of Treatment and Storage

1. Safe handling tips	Prevent occurrence or scattering of Dust. Avoid to breathe Dust · Fume · Gas · Mist · Steam · Spray.
2. Safe storage method	Use and store following regulations and rules of government ministry or local government. Save storage location with a locking device. Avoid to contact with strong acid material.

SECTION 8 Prevent of exposure and Personal protector

1. Exposure standard of chemicals, biological etc.

Exposure standard of chemicals (internal regulations)

Copper	Copper (Dust or Mist) TWA - 1mg/m ³ Copper (Dust or Mist) STEL - 2mg/m ³ Copper (Fume) TWA - 0.1mg/m ³
Ag	Ag (solubility compound) TWA-0.01mg/m ³ Ag (Metal) TWA-0.1mg/m ³

Exposure standard of chemicals (Regulation of ACGIH)

Copper	TWA 0.2 mg/m ³ , 1 mg/m ³ Copper (Fume), Copper (Dusts and mists, as Cu)
Ag	TWA-0.1mg/m ³

Exposure standard of biological	Copper	No data
	Ag	No data

2. Proper Engineering Management

Engineering Management	Install ventilator furnished explosion-proof electric installation in case there is possibility of explosion risk of consistency. Check work process which is proper to standard of permission and Exposure standards of Ministry of Labor. Install ventilator like local ventilation system and manage to maintain optimal velocity control of local exhaust.
------------------------	--

3. Personal protective equipment

Respiratory organ Protection	Do not need protection for breathe in common situation, but wear protection for breath which is certified by Korea Occupational Safety and Health Agency when Dust and Fume are occurred from specific chance of work condition.
Eye Protection	Install urgent cleaning facilities and wash facilities for worker to use easily. Wear safety glasses to protect eyes from missile.
Hand Protection	Wear hand protection to avoid direct contact.
Body Protection	Wear protective clothing which can prevent exposure in case there is direct skin exposure.

SECTION 9 Characteristic of physicochemical

1) Copper

1. Appearance	10. Ignition or upper and lower bound of Explosion range	No data
Temper	11. Steam pressure	No data
Color	12. Solubility	(Insolubility)
2. Smell	13. Vapor density	No data
3. Smell degree	14. Specific gravity	8.9 (Water=1)
4. pH	15. n-1-octanol/Coefficient division of water	

5. Melting/Freezing point	1160 °C	16. Spontaneous combustion temperature	No data
6. Early boiling point and range		17. Decomposition temperature	No data
7. Flashing point	No data	18. Viscosity	No data
8. Evaporating rate	No data	19. Molecular weight	
9. flammability (Solid, Gas)	No data		
2) Ag			
1. Appearance		10. Ignition or upper and lower bound of Explosion range	Notapplicable
Temper	Solid	11. Steam pressure	No data
Color	White	12. Solubility	(Insolubility)
2. Smell	No data	13. Vapor density	No data
다. Smell degree	No data	14. Specific gravity	10.5 (Water=1)
라. pH	No data	15. n-1-octanol/Coefficient division of water	
마. Melting/Freezing point	962 °C	16. Spontaneous combustion temperature	No data
바. Early boiling point and range	2212 °C	17. Decomposition temperature	No data
7. Flashing point	No data	18. Viscosity	No data
8. Evaporating rate	No data	19. Molecular weight	107.86
9. flammability (Solid, Gas)	No data		

SECTION 10 Safety and Reactivity	
1. Possibility of chemical safety and harmful reactivity	It is clam in ordinary temperature and pressure. There is possibility to be occurred causticity/toxicity Fume, even though material does not be burned well itself. Microscopic substances can be reacted with water. No polymerization.
2. Condition to avoid	Inhibit occurring of dust. Avoid Heat, Flame, Spark and other ignition source .
3. Material to avoid	Peroxides , Metals, Halogen , Ammine. Combustibles, Reducing agents (Ag)
4. Harmful substance which is created during decomposing	Pyrolysate: Other decomposition product Causticity/toxicity Fume Magnetic polarity, Causticity , Toxicity gas

SECTION 11 Information about Toxicity		
가. Information of High possibility of exposure course		
	Copper	Ag
Exposure course	No data	No data
나. Information of health harmfulness		
Acute toxicity		
	Copper	Ag
Oral	No data	LD50 > 5000 mg/kg Rat

Percutaneous	No data	LD50 > 2000 mg/kg Rat
Breathe	No data	No data
Skin corrosivity or Magnetic polarity	No data	Weak Magnetic polarity to Rabbit
Severe eye damage or Magnetic polarity	No data	Weak Magnetic polarity to Rabbit, Recover in 48 hours
Respiratory organ hypersensitiveness	No data	No data
Skin hypersensitiveness	No data	Occuring allelic contact dermatitis

Carcinogenicity

Copper

Ag

Occupation safety and health acts	No data	No data
Ministry of Labor announcement	No data	No data
IARC	No data	No data
OSHA	No data	No data
ACGIH	No data	No data
NTP	No data	No data
Germ cell mutagenicity	No data	No data
Reproduction-toxicity	No data	No data
Specific target long-term toxicity (Exposure at once)	Irritate upper airway	Possibility of lung dysfunction
Specific target long-term toxicity (Exposure at Repeatedly)	appear liver injury to people	Cause argyrosis and bronchial trouble
Absorption hamfulness	No data	No data

SECTION 12

Environmental impact

1. Ecotoxicology

Copper

Ag

Fish	LC50 0.37 mg/ℓ 96 hr	LC50 58 mg/ℓ 96 hr
Crustacean	EC50 0.0318 mg/ℓ 48 hr	No data
Birds	LC50 0.092 mg/ℓ 15 hr	No data

2. Persistent and Resolvability

Copper

Ag

Persistent	log Kow -0.57 (Estimation)	log Kow No data
Resolvability	No data	No data

3. Biological magnification

Copper

Ag

Magnification	BCF 5830	No data
Biodegradable	No data	No data

4. Soil Portability

No data

No data

5. Other Hanful effect

No data

No data

Caution of Disuse

1. Method of disuse	Classify Waste under Wastes Control Act and Handling following their characteristic Treat the content by company which has permission under Wastes Control Act.
2. Caution of disuse	Follow detailed standard and method of collection, transportation, storage, treatment under Wastes Control Act.

Information for Transportation

1. UN No.

Copper	3089
ZINC	1436
Ag	No data

2. Proper Vessel name	No data
-----------------------	---------

3. Risk Rank of Transportation

Copper	4.1
ZINC	4.3
Ag	Notapplicable

4. Containers grade

Copper	II
ZINC	I
Ag	Not applicable

5. Marine pollutant	No data
---------------------	---------

6. User need to know transportation or transportation methods or need Special safty measure

Emergency procedure in Fire

Copper	F-G
Ag	Notapplicable

Emergency procedure in spill

Copper	S-G
Ag	Notapplicable

Mandatory control present condition

1. Regulation of occupation safety and health acts

Copper	Control target material : Regulation of asterisk 7 about sanitation of industry
	Working environment measurement Material (Period measuring method : 6 month) : Occupation safety and health acts asterisk 11- 4
	Special health check material (Cycle diagnosis : 12month) : Occupation safety and health acts asterisk 12-2
	Standard of exposure setting material : Standard exposure of Chemiclas or Physical Parameters (Ministry of Labor announcement 2008-26)

Ag	Management object Material Working environment measurement Material (Period measuring method : 6 month) Standard of exposure setting material
----	---

2. Regulation of Toxic Chemicals Control Act Notapplicable
3. Regulation of Safety Control of Dangerous Subs Notapplicable
4. Regulation of Wastes Control Act Notapplicable
5. Other Domestic or overseas regulation No data

SECTION 16

Other reference

1. Source of data
 1. National Environmental Research, the chemical information system: (NCIS)
 2. The headquarters countries dangerous goods information system
 3. In- company Testing data analysis(Wonil Quality Management team)
 4. Reference chemical exposure, the Ministry of labor research program (2005)
 5. Other related regulation and announcement data
2. First date of preparation 2006. 04. 17.
3. Number of revision and the final revision date
 - Number of revision 4
 - Final revision date 2014. 01. 10.
4. Etc.

This Material Safety Data Sheet(MSDS) is completed by using MSDS Editing Program which is from Korea Occupational Safety and Health Agency matching the standard of (Ministry of Labor announcement 2009-68, 2009.10.26) GHS(Globally Harmonized System of Classification and Labelling of Chemicals) as following chemical material classification · expression and standard of material safety data sheet.

This data does not vouch for quality of product and describe about treatment of safty, health, environment matters as usual states. Please use material after checking additory Safety and Health issues if temper is changed by heat or treatment under method of use.

also, this data can be revised without notice, and can be offered via our website (www.wonilsa.co.kr). Please contact our Quality management team for other detailed issues.