Simba Materials Limited t/a

CTM Potters Supplies

COPPER CARBONATE

Safety Data Sheet 14

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1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Name Copper Carbonate, Cupric Carbonate, Malachite, Copper (II) Carbonate
CAS No 12069-69-1
EC No 235-113-6
REACH reg. no 01-2119513711-xxxx
Formula $CuCO_3 \cdot Cu(OH)_2$

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Product use The following industrial, professional and consumer uses of Copper dinitrate have been identified under the requirements of the EU REACH Regulation:

Product number	Identified use name	Industrial	Professional	Consumer
1	Absorbents	✓		
2	Ceramics	✓	✓	✓
3	Coatings	✓	✓	✓
4	Electroplating and galvanic	✓	✓	
5	Fertiliser	✓	✓	✓
6	Glass	✓	✓	✓
7	Laboratory chemicals	✓	✓	
8	Lubricants and greases	✓	✓	✓
9	Leather dyes	✓		✓
10	Non-metal surface treatment	✓		
11	Processing aids	✓		
12	Putties, fillers, construction chemicals	✓	✓	✓
13	Polishes and waxes	✓	✓	✓
14	Raw material for production of other compounds and fine chemicals	✓		
15	Catalysts	✓		
16	Biocidal and Plant Protection Products (non-active ingredient use)	✓	✓	
17	Pyrotechnics (including fireworks, airbags)		✓	✓

2 HAZARDS IDENTIFICATION

Classification according to regulation (EC) no. 1272/2008 (Classification, labelling and packaging)

Signal word Warning

Hazard statement	H302	Harmful if swallowed (Acute Tox. 4).
	H400	Very toxic to aquatic life (Aquatic Acute 1).
	H411	Toxic to aquatic life with long-lasting effects (Aquatic Chronic 2).
Precautionary statement - Prevention	P264	Wash thoroughly after handling.
	P270	Do not eat, drink or smoke when using this product
	P273	Avoid release to the environment.
Precautionary statement - Reaction	P301/312	IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell.
	P330	Rinse mouth.
Precautionary statement - Disposal	P391	Collect spillage.
	P501	Dispose of contents/container as or special waste in accordance with applicable law

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	CAS	EINECS	Value	Hazard
Copper Carbonate basic	12069-69-1	235-113-6	100%	H302: Acute Tox. 4 H400: Aquatic Acute 1 H411: Aquatic Chronic 2
Ingredients determined not to be hazardous	--	--	--	--

4 FIRST AID MEASURES

Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Ingestion

Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious,

place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Should any symptoms persist, seek medical attention.

5 FIRE-FIGHTING MEASURES

Extinguishing media	Use an extinguishing medium suitable for the surrounding fire (e.g. water, foam, Carbon Dioxide, and dry powder)
Protective equipment	In the event of a fire, full protective clothing and self-contained breathing apparatus should be worn.
Hazardous combustion products	In the event of fire; Carbon Dioxide, Carbon Monoxide and Copper oxides may be released.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures	In case of accidental spillage avoid dust formation and use personal protective equipment.
Environmental precautions	Do not allow material to enter rivers, water courses, or sewers. If it does, the relevant environmental protection or waste management authority should be informed.
Methods and materials for containment and clean-up	Clean/scoop up spills immediately, and then place into a suitable container for disposal.

For more information on exposure controls, personal protection, or disposal considerations; check sections 8 to 13 of this Safety Data Sheet.

7 HANDLING AND STORAGE

Handling	Avoid generating dust, using the smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Label containers, and keep them closed when not in use. Wear appropriate protective equipment to prevent inhalation, skin and eye contact. Ensure a high level of personal hygiene is maintained when using this product: always wash hands before eating, drinking, smoking, or using the toilet.
Storage	Not combustible. Store in a dry place and keep container tightly closed.
Specific end uses	Check the identified uses in Section 1 of this Safety Data Sheet.

8 EXPOSURE CONTROLS & PERSONAL PROTECTION

Control parameters for Industrial Settings

Substance	Short term exposure limit (15m STEL)	Long term exposure limit (8h TWA)	Units	Source
Copper fumes (as Cu)	--	0.2	mg/m^3	OSHA
Copper dusts or mists	2	1	mg/m^3	OSHA

Predicted No Effect Concentrations (PNECs) and Derived No Effect Levels (DNELs)

Exposure pattern	Route	Descriptor	DNEL/PNEC
Worker: long term systemic effects	Dermal (external)	DNEL for dry Copper compounds.	137 mg/kg bw/day
Worker: long term systemic effects	Dermal (external)	DNEL for dry slurries or Copper compounds found in solution.	137 mg/kg bw/day
General population: long term systemic effects	Oral (internal)	DNEL based on internal Copper dose.	0.041 mg Cu/kg bw/day
Environmental	Freshwater	PNEC, including a default bioavailability correction.	7.8 µg dissolved Cu/l (1)
Environmental	Marine water	PNEC, including a default bioavailability correction.	5.2 µg dissolved Cu/l (1)
Environmental	Sediment freshwater	PNEC	87 mg Cu/kg dry wt (1)
Environmental	Sediment estuarine	PNEC	288 mg Cu/kg dry wt (1)
Environmental	Sediment marine	PNEC, including a default bioavailability correction.	676 mg Cu/kg dry wt (1)
Environmental	Soil	PNEC	65 mg Cu/kg dry wt (1)
Environmental	STP	PNEC	0.23 mg dissolved Cu/L

Engineering controls No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Hygienic measures When using; do not eat, drink or smoke. Wash hand before breaks and at the end of work. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels; the hazards of the product; and the safe working limits of the selected respirator.

Eye protection Wear safety goggles or full-face shield.

Skin protection Wear rubber gloves and dust proof clothing. Gloves should be changed regularly to avoid permeation problems.

Environmental exposure controls Emissions from ventilation or work process equipment should be checked to ensure that they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will need to be installed in order to reduce emissions to acceptable levels.

Other information For environmental assessment, the Metal EUSES calculator for Downstream Users can be freely downloaded from http://www.arche-consulting.be/Metal-CSA-toolbox/du-scaling-tool. For environmental monitoring, the physico-chemical characteristics of the local receiving environment should preferably be monitored (see section 12).

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance Solid; green, moist powder.

Odour None detectable (at 21 ^{o}C)

Decomposition point 206 ^{o}C (dehydrated from approx. 105 ^{o}C)

Melting point >400 ^{o}C

Relative density / Specific gravity 3.48 at 21.4 ^{o}C

Solubility in water	0.1 – 100 mg/L
Flammability	Not flammable.
Oxidising properties	Not oxidising
Particle size distribution	(Volume) D10 = 4.43 µm, D50 = 16.2 µm, D90 = 33.7 µm (Number) D10 = 0.271 µm, D50 = 0.397 µm, D90 = 0.748 µm

10 STABILITY AND REACTIVITY

Reactivity	N/A (see Section 9)
Chemical stability	Stable under normal conditions.
Conditions to avoid	None known.
Incompatible materials	Acids.
Decomposition products	Carbon Dioxide and Carbon Monoxide may be produced.
Hazardous polymerisation	Will not occur.

11 TOXICOLOGICAL INFORMATION

Bio-availability

Absorption	Copper is an essential element and therefore its concentration in the body is strictly and efficiently regulated by homeostatic mechanisms.	
	Oral:	An oral absorption of 25% has been adopted, based upon studies in rats.
	Inhalation:	The "respirable" fraction is assumed to be 100% absorbed. Absorption of the "inhalable" fraction depends on the particle size. The Multiple Path Model of Particle Decomposition (MPPD) can quantify the particle dependent absorption.
	Dermal:	A dermal absorption of 0.3% has been adopted for soluble and insoluble Copper substances in solution or suspension, based on in- vitro percutaneous tests with human skin. For dry exposure, a dermal absorption value of 0.03% applies.
Acute toxicity	Oral:	LD50 > 500 mg/kg, < 2000 mg/kg/bw (rat). Test guideline OECD 401 [ ], EPA OPPTS 870.1100 (Acute oral toxicity). Copper Carbonate is classified as harmful.
	Inhalation:	N/A
	Dermal:	LD50> 2000 mg/kg (rat). Copper Carbonate is not classified.
Repeated dose toxicity	Oral:	(Sub-chronic) LOAEL: 2000 ppm, NOAEL:1000 ppm for male and female mice.

	Inhalation: (Sub-acute) LOEL: 0.2 mg/m^3 air, NOAEL: ≥ 2 mg/m^3 air for male and female mice
Sensitisation	An *in vivo* maximisation test was carried out to OECD Guideline 406 and EU Method B.6 standards, using female Guinea Pigs. Copper Carbonate was injected intradermally into 6 groups of 10 Guinea Pigs, and then after a 24 hour rest phase a single topical application of Copper Carbonate was applied under an occlusive dressing for 24 hours (the challenge phase). No cutaneous intolerance reaction was recorded at 48 hours after the challenge phase. Copper Carbonate is not classified as a skin sensitizer.
Genotoxicity	Negative.
Carcinogenicity	Based on weight of evidence, Copper compounds do not have carcinogenic potential.
Toxicity to reproduction	Two-generation tests were taken on rats, according to EPA OPPTS 870.3800 (Reproduction and Fertility effects) and OECD Guideline 416. No reproductive toxicity was seen at any concentration – although a NOAEL of 23.6 mg/kg bw/day was assigned for P1 males during premating; and effects were seen in F1 and F2 weanlings.

12 ECOLOGICAL INFORMATION

Eco-toxicity	Copper is a necessary trace element and stimulates plant growth and yield on Copper deficient soil. Copper is an integral part of various oxidation enzymes, and several animal diseases may occur if the diet is deficient in Copper.
Acute aquatic toxicity test results and environmental classification	Acute toxicity of Copper ions was assessed using 451 L(E)C_{50} values from studies on soluble Copper compounds. The lowest species-specific geometric mean reference value of 25.0 µg Cu/L was an L(E)C_{50} obtained for *Daphnia magna* at pH 5.5 - 6.5 [Van Sprang et al., 2010]. Copper is an essential nutrient regulated by homeostatic mechanisms and does not bio-accumulate. Bio-available Copper ions are rapidly removed from the water column [Rader, 2010].
Chronic freshwater toxicity test results and PNEC derivation	Chronic toxicity of Copper ions from soluble Copper compounds was assessed using 104 NOEC/EC_{10} values from 34 species representing different trophic levels (fish, invertebrates, and algae). Species-specific NOECs were calculated after normalizing to Dissolved Organic Carbon (DOC) and were used to derive SSDs and HC_5 values. Normalization at a typical DOC for freshwaters of 2 mg/l resulted in an HC_5 of 7.8 µg dissolved Cu/L. Applying an assessment factor of 1, a default chronic freshwater PNEC of 7.8 µg dissolved Cu/l is assigned to assess local risks.
Chronic marine waters toxicity test results and PNEC derivation	Chronic toxicity of Copper ions from soluble Copper compounds was assessed using 51 NOEC/EC_{10} values from 24 species representing different trophic levels (fish, invertebrates and algae). Species-specific NOECs were calculated after normalizing to Dissolved Organic Carbon (DOC) and were used to derive SSDs and HC5 values. Normalization at a typical DOC for coastal waters of 2 mg/l resulted in an HC5 of 5.2 µg dissolved Cu/L. Applying an assessment factor of 1, a default chronic marine PNEC of 5.2 µg dissolved Cu/l is assigned to assess local risks.
Chronic marine water sediment toxicity test results and PNEC derivation	Toxicity of Copper ions from soluble Copper compounds was assessed using 62 NOEC values from 6 benthic species. The NOECs were related to DOC and Acid Volatile Sulphide (AVS) and were used to derive SSDs and HC_5 values. An HC_5 of 1741 mg Cu/kg OC, corresponding to 87 mg Cu/kg dry weight, was calculated for a low AVS sediment with a default OC of 5%. Applying an assessment factor of 1, a default chronic marine water sediment PNEC of 676 mg Cu/kg dry weight is assigned to assess local risks.

Chronic freshwater sediment toxicity test results and PNEC derivation	Toxicity of Copper ions from soluble Copper compounds was assessed using 62 NOEC values from 6 benthic species. The NOECs were related to DOC and Acid Volatile Sulphide (AVS) and were used to derive SSDs and HC_5 values. An HC_5 of 1741 mg Cu/kg OC, corresponding to 87 mg Cu/kg dry weight, was calculated for a low AVS sediment with a default OC of 5%. Applying an assessment factor of 1, a default chronic freshwater sediment PNEC of 87 mg Cu/kg dry weight is assigned to assess local risks.
Chronic terrestrial toxicity test results and PNEC derivation	Toxicity of Copper ions from soluble Copper compounds was assessed using 252 NOEC/EC_{10} values from 28 different species representing different trophic levels (decomposers, primary producers, primary consumers). NOEC values were adjusted to account for differences between lab-spiked soils and field-contaminated soils by the addition of a leaching ageing factor of 2. The adjusted values were then normalized to a range of EU soils using regression bio-availability models and used to derive SSDs and a lowest HC_5 value of 65 mg Cu/kg dry weight [Oorts et al., 2010]. Applying an assessment factor of 1, a default chronic soil PNEC of 65 mg Cu/kg dry weight is assigned.
Toxicity to Sewage Treatment Plant (STP) micro-organisms	The toxicity of Copper ions from soluble Copper compounds was assessed using NOEC and EC_{50} values from high quality studies with STP bacteria and protozoa. The NOEC was 0.23 mg Cu/L in the STP [Cha et al., 2004]. Applying an assessment factor of 1, a PNEC of 0.23 mg Cu/L is assigned for Sewage Treatment Plant.

For more information on how the environmental classification was derived and how to assess bio-availability, contact your supplier.

Persistence and Degradability	
Bio-accumulative potential	The “bio-accumulative” criteria are not applicable to essential metals.
Mobility in soil	Copper ions bind strongly to soil. The median water-soil partitioning coefficient (kp) is 2120 L/kg.
Results of PBT and vPvB assessment	The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as copper and its inorganic compounds. Copper (as Copper Carbonate) is not PBT or vPvB.
Other adverse effects	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

For more information on how the environmental classification was derived and how to assess bio-availability, contact your supplier.

13 DISPOSAL CONSIDERATIONS

Local and national regulations should be followed.

14 TRANSPORT INFORMATION

Sea transport (IMDG)	UN number:	3077
	Proper shipping name:	Environmentally hazardous substance, solid, n.o.s (Copper Carbonate)
	Hazard class(es):	9
	Packing group:	III

	EmS number:	F-A, S-F
	Marine pollutant:	Yes (P)
Air transport (ICAO/IATA)	UN number:	3077
	Proper shipping name:	Environmentally hazardous substance, solid, n.o.s (Copper Carbonate)
	Hazard class(es):	9
	Packing group:	III
Land transport (ADR/RID)	UN number:	3077
	Proper shipping name:	Environmentally hazardous substance, solid, n.o.s (Copper Carbonate)
	Hazard class(es):	9
	Classification code:	M7
	Packing group:	III
	Special provisions:	274, 335, 601
Inland waterways (AND)	UN number:	3077
	Proper shipping name:	Environmentally hazardous substance, solid, n.o.s (Copper Carbonate)
	Hazard class(es):	9
	Packing group:	III

15 REGULATORY INFORMATION

EEC classification Harmful, dangerous to the environment.

Label risk & safety phrases See section 2.

16 OTHER INFORMATION

Supplier's notes This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.