SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **COPPER CEMENTATE**

Synonyms COPPER CEMENT ● COPPER CONTAINING COMPOUND ● PP CEMENTATE ● PP RESIDUE ● PRIMARY PURIFICATION RESIDUE

1.2 Uses and uses advised against

Uses INDUSTRIAL APPLICATIONS

1.3 Details of the supplier of the product

Supplier name **NYRSTAR HOBART**

Address Risdon Road, Lutana, TAS, 7001, AUSTRALIA

Telephone (03) 6278 4444

Fax (03) 6278 4608

Email info@nyrstar.com

Website http://www.nyrstar.com

1.4 Emergency telephone numbers

Emergency (03) 6278 4554

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Physical Hazards

Not classified as a Physical Hazard

Health Hazards

Acute Toxicity: Inhalation: Category 2
Germ Cell Mutagenicity: Category 2
Carcinogenicity: Category 1B
Toxic to Reproduction: Category 1A
Specific Target Organ Toxicity (Repeated Exposure): Category 1

Environmental Hazards

Aquatic Toxicity (Chronic): Category 1

2.2 GHS Label elements

Signal word **DANGER**

Pictograms

Hazard statements

H330	Fatal if inhaled.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Prevention statements

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P284	Wear respiratory protection.

Response statements

P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P310	Immediately call a POISON CENTRE or doctor/physician.
P320	Specific treatment is urgent - see first aid instructions.
P391	Collect spillage.

Storage statements

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statements

P501	Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
COPPER	7440-50-8	231-159-6	43 to 77.7%
CADMIUM	7440-43-9	231-152-8	1.8 to 14.6%
ZINC	7440-66-6	231-175-3	2.8 to 12.7%
LEAD	7439-92-1	231-100-4	0.1 to 8%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use a Full-face Class P3 (Particulate) respirator where an inhalation risk exists. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Fumes may irritate the respiratory tract. Inhalation of fumes may cause lung oedema and metal fume fever. Effects may be delayed. Medical observation is indicated.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide or foam. Prevent contamination of drains and waterways.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases (cadmium oxides) when heated to decomposition. Dust may form explosive mixtures with air. May evolve lead oxides when heated to decomposition.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

2X

2 Fine Water Spray.

X Wear liquid-tight chemical protective clothing and breathing apparatus. Contain spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse, treatment and/or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs.

7.3 Specific end uses

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Cadmium and compounds (as Cd)	SWA [AUS]	--	0.01	--	--
Cadmium and compounds (as Cd)	SWA [Proposed]	--	0.001	--	--
Copper (fume)	SWA [AUS]	--	0.2	--	--
Copper (fume, dusts & mists)	SWA [Proposed]	--	0.01	--	--
Copper, dusts & mists (as Cu)	SWA [AUS]	--	1	--	--
Lead, inorganic dusts & fumes (as Pb)	SWA [AUS]	--	0.05	--	--

Biological limits

Ingredient	Reference	Determinant	Sampling Time	BEI
CADMIUM	ACGIH BEI	Cadmium in urine	Not critical	5 µg/g creatinine
	ACGIH BEI	Cadmium in blood	Not critical	5 µg/L
LEAD	ACGIH BEI	Lead in blood	Not critical	200 µg/L
	ACGIH BEI	Lead in blood (women of child bearing potential)	Not critical	10 µg/100ml
	SWA [AUS]	Lead in blood (women of child bearing potential)	Not critical	10 µg/dL
	SWA [AUS]	Lead in blood	Not critical	30 µg/dL

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face Wear dust-proof goggles.

Hands Wear PVC or rubber gloves.

Body Wear coveralls. In a laboratory situation, wear a laboratory coat.

Respiratory Wear a Class P1 (Particulate) respirator. At high dust levels, wear an Air-line respirator or a Full-face Class P3 (Particulate) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	BLACK SOLID
Odour	SLIGHT ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	> 5.5
Vapour density	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions
Hazardous polymerisation is not expected to occur.

10.4 Conditions to avoid
Avoid contact with incompatible substances.

10.5 Incompatible materials
Incompatible with oxidising agents (e.g. hypochlorites) and acids (e.g. nitric acid).

10.6 Hazardous decomposition products
May evolve toxic gases (cadmium oxides) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute toxicity Fatal if inhaled.

Information available for the ingredients:

Ingredient	Oral LD50	Dermal LD50	Inhalation LC50
COPPER	--	> 2000 mg/kg (rat)	--
CADMIUM	890 mg/kg (mouse)	--	25 mg/m³/30M (rat)
LEAD	50 mg/kg to 600 mg/kg (calf)	--	--

Skin Contact may result in irritation, redness, rash and dermatitis. May cause discolouration of the skin.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Cadmium is suspected of causing genetic defects.

Carcinogenicity Cadmium and cadmium compounds are classified as carcinogenic to humans (IARC Group 1). The evidence was classified as sufficient for lung cancer and limited for prostate and kidney cancer (Straif et al. 2009).

Reproductive Cadmium is suspected of damaging fertility and the unborn child.

STOT - single exposure Acute over exposure to cadmium dust and fumes (if heated) may result in chest pain, sweating, chills, weakness, pulmonary oedema and death. Effects may be delayed.

STOT - repeated exposure Repeated exposure to cadmium may result in kidney disease (including proteinuria, a decrease in glomerular filtration rate, and an increased frequency of kidney stone formation) and lung damage (including bronchiolitis and emphysema). Animal studies have also indicated effects on the liver, bone, immune system, blood, and nervous system.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
Cadmium is extremely environmentally hazardous. Highly toxic to aquatic organisms (LC50 for Rainbow Trout: 0.007 ppm/96 hours). Toxic to livestock at 0.05 ppm and to irrigable plants at 0.01 ppm. Threatens all forms of life, especially crops. Very toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability
Cadmium is an element and as such, the criterion "persistence" is not applicable to Cd and Cd-compounds. As an alternative for persistency (for organic substances), the concept of "removal from the water column" has been developed for inorganic elements. The rapid removal of cadmium from the water column is documented. So, cadmium can be considered as equivalent to "degradable" and, consequently, does not match in chronic toxicity terms with the criterion "persistent" (REACH).

12.3 Bioaccumulative potential
Cadmium concentrates in food chain (shellfish concentrate cadmium 1600 times).

12.4 Mobility in soil
No information provided.

12.5 Other adverse effects
Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Environmental pollutant. Convert small quantities to insoluble sulphide. Convert to nitrates with a minimum of nitric acid. Evaporate in a fume cupboard to a thin paste and saturate with hydrogen sulphide. Filter precipitate and dispose of to hazardous waste landfill. Destroy excess sulphide with sodium hypochlorite. Neutralise solution before flushing to sewer. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	3288	3288	3288
14.2 Proper Shipping Name	TOXIC SOLID, INORGANIC, N.O.S. (contains lead, cadmium)	TOXIC SOLID, INORGANIC, N.O.S. (contains lead, cadmium)	TOXIC SOLID, INORGANIC, N.O.S. (contains lead, cadmium)
14.3 Transport hazard class	6.1	6.1	6.1
14.4 Packing Group	II	II	II

14.5 Environmental hazards

Marine Pollutant.

14.6 Special precautions for user

Hazchem code 2X

EmS F-A, S-A

Other information The environmentally hazardous substance mark is not required when transported in packages of less than 5 kg/L (UN Model Regulations: Special Provision 375; IATA: Special Provision A197; IMDG: Special Provision 969) or less than 500 kg/L by Australian Road and Rail.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safe Work Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals (GHS Revision 7).

Inventory listings **AUSTRALIA: AIIC (Australian Inventory of Industrial Chemicals)**
All components are listed on AIIC, or are exempt.

16. OTHER INFORMATION

Additional information This product is refined to produce copper sulphate.

PRIORITY POLLUTANT - ENVIRONMENTAL TOXICITY: This product is known to adversely affect aquatic or animal life in small concentrations. Will accumulate or biomagnify.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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