

CUPRICIDE®

...the affordable algicide



Lake that has an algae infestation, with applications of Cupricide® the lake will not have this problem in the future

AGMIN CHELATES PTY LTD

For further enquiries or ordering: www.cupricide.com

CUPRICIDE[®] MANUAL CONTENTS

What Makes Agmin Chelates Pty Ltd Unique	Page 3
Mode of Action of Copper Algicides	Page 4
Mode of Action of Cupricide [®]	Pages 5 - 7
Agmin Cupricide [®] Algicide	Pages 8 - 9
Agmin Cupricide [®] Liquid Copper Algicide Data Sheet & Use Guide	Pages 10 – 11
Types of Algae	Page 12
Withholding Period for Water Treated With Cupricide [®]	Page 13
How Long Does Cupricide [®] Last?	Page 13
Cupricide [®] Addition Rates	Page 14
Cupricide [®] Drip System Application in Irrigation Conveyance Systems	Page 15
NRA Cupricide [®] Algicide Approved Label	Page 16
Cupricide [®] Algicide Material Safety Data Sheet	Pages 17 - 20
How to Contact Agmin Chelates	Page 21

WHAT MAKES AGMIN CHELATES PTY LTD UNIQUE?

Our comprehensive and long-term applied research and development programs in soil science, plant nutrients and metal chelates have produced a range of products for agriculture and horticulture. These products are designed to improve the productivity and quality of pastures, fruits, vines, nuts, vegetables, ornamentals and plantation trees.

Company History

Agmin Chelates Pty Ltd was founded in 1984 and has established its headquarters in Geelong with sales and services offices, laboratory and production facilities on one integrated site.

Agmin Chelates has distributors in all States of Australia and provides technical service support to all locations. The technical staff comprises of professional chemists and agronomists with more than 30 years of combined experience in trace element nutrition for soils and plants.

Quality

Agmin Chelates has demonstrated its commitment to quality by designing high-performance products with guaranteed results in increased yield, quality and productivity of plants.

Agmin's Algicides and Plant Nutrients must pass strict quality control procedures before they are released for despatch. Each batch of product is guaranteed to conform to specifications and efficacy in performance.

Technology

Agmin Chelates is constantly striving to improve the efficacy and technology base of its products. The company builds on the latest research published in the fields of plant nutrients and soil science. New products and services are developed regularly to meet market needs by utilising the best available technology from worldwide sources in research and materials manufacture.

Service

Agmin Chelates strives to be the leading supplier of agricultural micronutrient technology. Our services are based on the following customer centred basics:

- Extensive technical assistance through our laboratory in analysing for plant nutrients.
- Evaluation of nutrient deficiencies and advice to rectify these.
- Supply of customer-specific products to satisfy nutrient requirements.
- Provision of test kits for collection of soil and plant samples for analysis.
- Efficient distribution system to overcome supply and logistics problems in product delivery.

Innovation

Agmin Chelates is continuing its pioneering work using the chemical technology of metal chelates to develop innovative products for commercial applications in agriculture and animal nutrition for mineral supplements.

Important new developments are Cupricide – a potent new Algicide for the rural sector and Foliar Nutrients – a range of liquid, chelated nutrients for spray application to leaves in broad acre agriculture and horticulture.

MODE OF ACTION OF COPPER ALGICIDES

Background

In 1956, Maloney and Palmer found that copper ions in solution at a concentration of 0.1 – 0.5 ppm (mg/L) were capable of killing all algal cells, depending on the species tested. Not surprising, it has been found subsequently that there is a wide range of activity of copper ions against fresh water algae. The Table below summarises the main species of algae which have been tested against copper ions.

Table 1

Algae Species	Lethal Cu Concentration
Planktonic Algae (suspended, colony forming)	0.1 – 0.5 ppm
Filamentous Algae (mat-forming, thick-walled)	0.2 – 0.6 ppm
Chara and Nitella	0.4 – 0.8 ppm

These early algicides were based on copper sulphate, which has several disadvantages:

- Carbonate in hard water precipitates copper ions
- Humic substances in natural waters reduce the availability of copper ions
- Free copper ions may be toxic to some fish species
- Toxic sediments accumulate on the bottom of the water body

Based on this historical background, Agmin Chelates Pty Ltd has developed a new stable copper-based algicide, Cupricide[®], which overcomes the inherent disadvantages of copper sulphate, but displays high activity to the above range of algae.



MODE OF ACTION OF CUPRICIDE®

Based on the fundamental principles of photosynthesis, we believe that Cupricide® is a potent inhibitor of photophosphorylation in the chloroplast cells of algae.

Photosynthesis is a chemical process used by algae in converting water, carbon dioxide and sunlight into oxygen and carbohydrates (such as sugar, starch, cellulose) – *Refer Figure 1.*

The reactions involved in photophosphorylation take place mainly in the “thylakoid membranes”, which are part of the granular structures contained within the walls of green chloroplasts. - *Refer Figure 2.*

Sunlight, a form of energy, is collected by chlorophyll molecules in the thylakoid membrane and is used to drive a complex sequence of reactions, involving electron transport between molecules, including water, oxygen, hydrogen ions, several proteins and quinones.

Some of these proteins include ferredoxin (contains iron) plastocyanine (contains copper), cytochromes (contains iron) as well as plastoquinone. From laboratory studies of photosynthesis on isolated cells of chloroplasts, it is clear that interruption of any stage in the sequence of photophosphorylation will destroy the ability of the algal cell to photosynthesise and to survive.

Cupricide® has been found to destroy the thylakoid membrane, causing loss of chlorophyll and breakdown in the Photosystem II necessary to harvest sunlight. As a result, the algal cell ceases to function and literally shuts-down to die within a few days.

The following schematic diagram (*Figure 1, next page*) shows the reaction stage, when Cupricide® intercepts the electron transport from Photosystem II (chlorophyll-protein complex) to the high-energy intermediate electron carrier, Q.

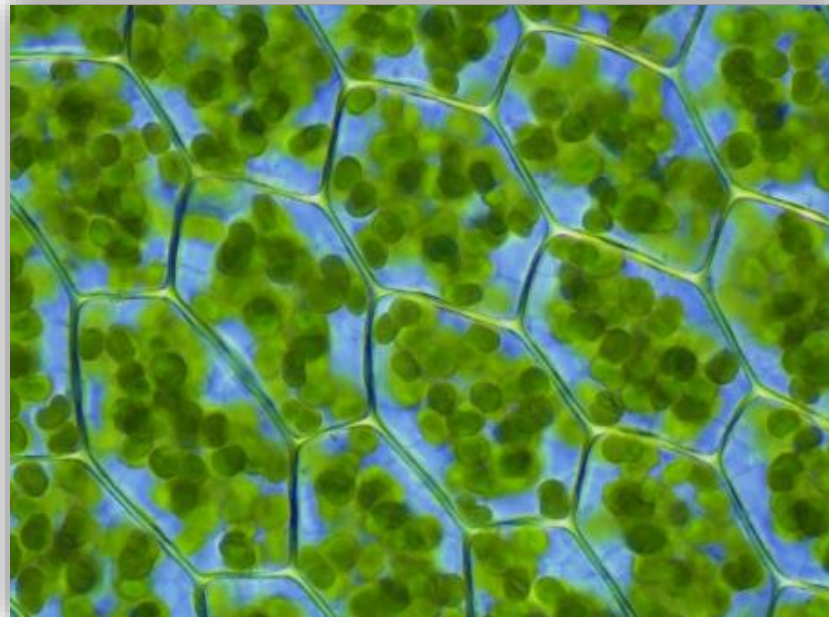


Figure 1

Photo-Phosphorylation Scheme

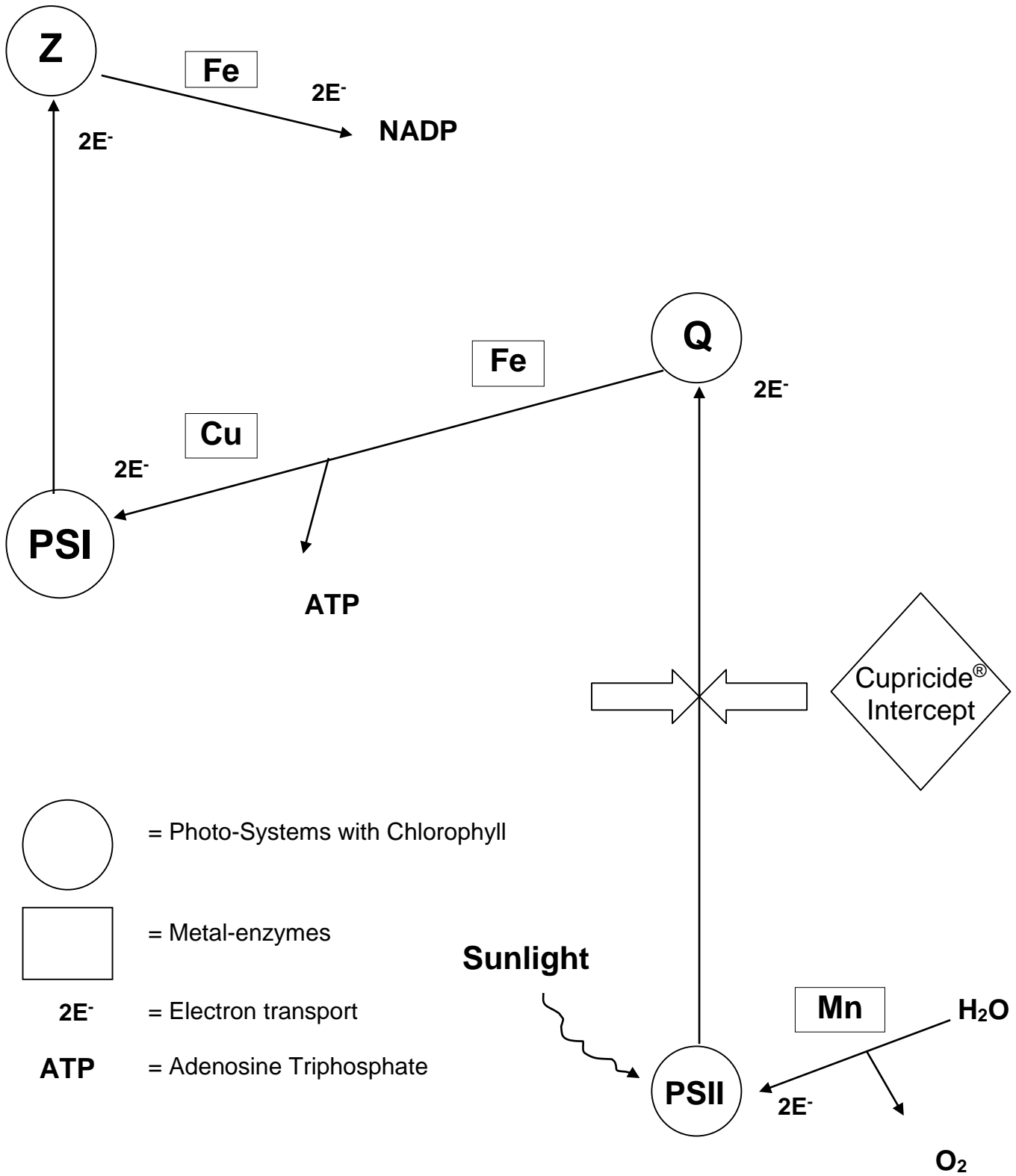
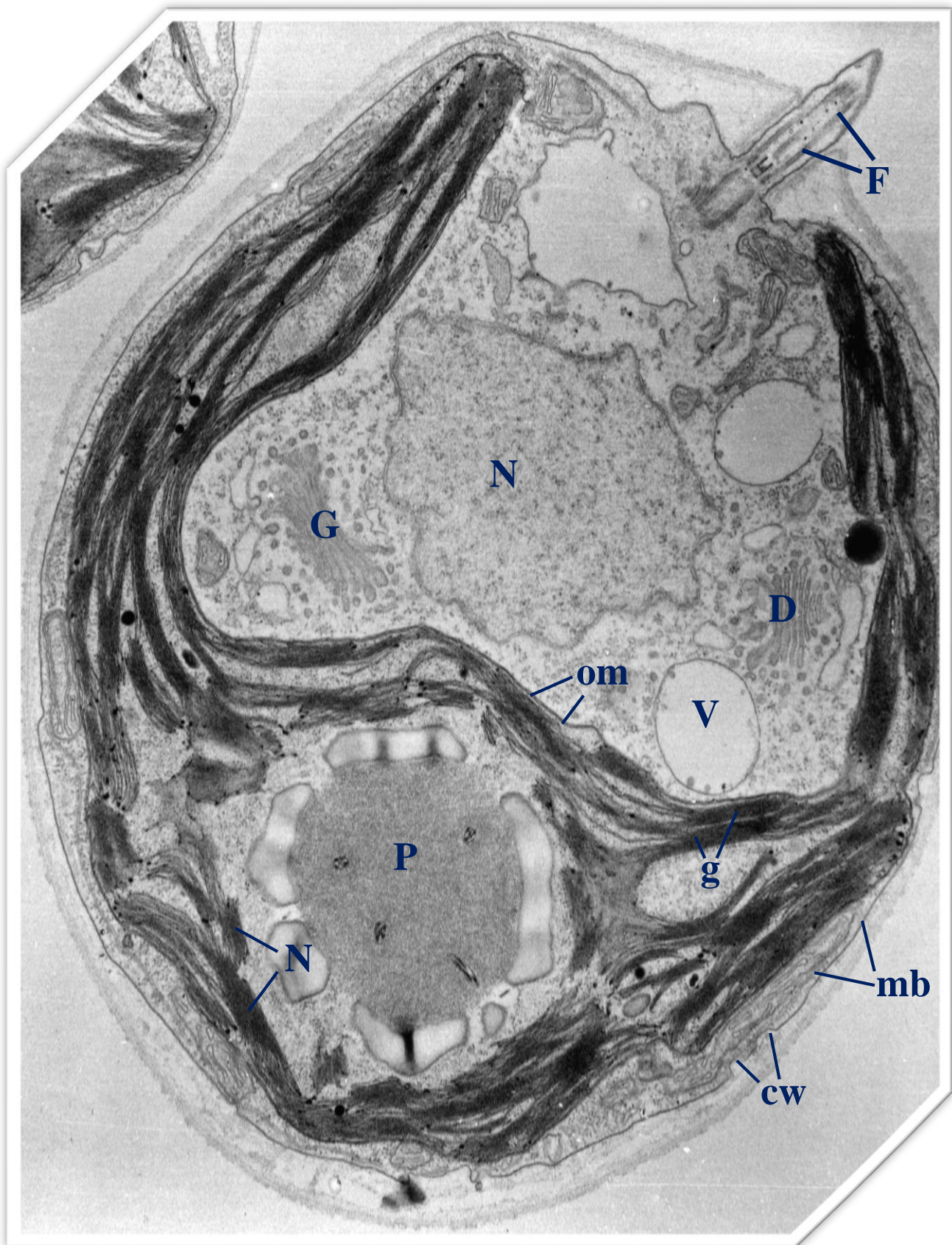


Figure 2

The Chloroplast and Other Plastids



Electron micrograph of *Chlamydomonas* showing the huge chloroplast; grana (**g**), the pyrenoid (**P**), Golgi complex (**G**), flagellum (**F**), membrane (**mb**), cell wall (**cw**), nucleus (**N**), outer membrane of the chloroplast (**om**), vacuole (**V**), x 8000.

AGMIN CUPRICIDE® ALGICIDE

Agmin Cupricide® is a copper containing algicide that provides economical and effective control of a broad spectrum of filamentous and planktonic algae. Its intended use is in potable water reservoirs, farm and fish ponds, lakes and fish hatcheries.

Chemistry and Physical Properties

Chemical Family:	Copper complex with organic ligand
Solubility in Water:	Miscible
Common Name:	Copper chelate
Stability:	Stable to light
Vapour Pressure (Kpa):	As Water
Trademark:	Cupricide®
Formulations:	One single-product formulation of Cupricide® is available containing 105g of elemental copper per litre
Boiling Point:	100°C
Physical State:	Liquid
Colour:	Royal Blue
Odour:	Slight ammoniacal
pH:	9.6
Specific Gravity:	1.25
Mode of Action:	The mode of action for Cupricide® is uptake by the algal cells where the copper ion inhibits photosynthesis providing a fast-acting mortality.

Causes and Effects of Excessive Nuisance Growth of Aquatic Algae

Worldwide water supplies are threatened by excessive nutrients entering water supplies through agricultural runoff, wastewater discharges, detergent wastes, septic tank seepage and lawn and garden runoffs. Water containing excessive nutrients support dynamic growth of aquatic algae which interfere with intended uses of the water and sometimes present health hazards to humans and animals. Algae are primitive plants which have no true leaves, stems or root systems.

Blue-green algae may cause illness, sometimes fatalities, in pets, livestock and wildlife. Exposure to or ingestion of blue-green algae may also cause a variety of discomforts in humans. Algae contamination of drinking water may discolour the water and create unpleasant tastes and odours. Excessive algae growth may also impart distasteful flavour to fish.

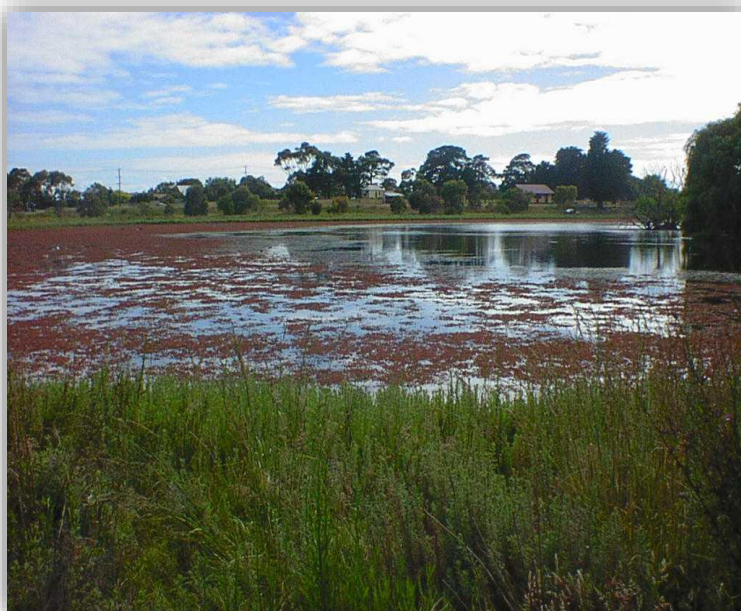
Decomposition of algae may deplete dissolved oxygen in bodies of water and kill fish. Excessive algae may block the intake of water from ponds and irrigation systems. Algae in wastewater oxidation ponds may elevate solids contents and biological oxygen demand. Scenic lakes, ponds, lagoons and shorelines may become unsightly with excessive algae growth.

Copper sulphate has been used extensively to control algae in many settings and to control parasites in fish aquaculture, but it has several disadvantages. Large quantities of copper sulphate are frequently necessary to satisfy the copper demand of a body of water caused by carbonate ions, which have an affinity for copper ions that precipitate out of the water. Also, copper ions that are not chelated may be very toxic to fish. The toxicity of copper sulphate varies with water hardness and is greater in soft water. Copper sulphate solution is unstable in sunlight and warm temperatures.

Cupricide[®] algicide combines the copper ions with organic complexing/chelating agents known as ethanolamines in order to eliminate the precipitation problem of copper sulphate and to render the copper less toxic to fish. Cupricide[®], unlike copper sulphate, is not corrosive to equipment. It also has a long shelf life.

Cupricide[®] is effective in a wide range of fresh water systems. It works with systemic action by preventing photosynthesis within the chloroplasts of algal cells. The complex copper in Cupricide[®] is longer lasting than copper sulphate solutions and remains in solution for extended control. It provides economical and effective control of a broad spectrum of filamentous and planktonic algae.

Cupricide[®] is most effective when it is applied in bright, early morning sunlight under calm conditions when water temperature is at least 15°C. Apply at the first sign of an algae bloom, if possible. Algae control will occur in 3 to 7 days following application. Re-apply when regrowth appears. Water treated with Cupricide[®] may be used for swimming, fishing, watering livestock and for irrigating turf, fairways, putting greens and ornamental plants immediately after treatment.



Algae makes a lake or water area look unsightly and almost unusable depending on the level of infestation.

AGMIN'S CUPRICIDE® LIQUID COPPER ALGICIDE DATA SHEET & USE GUIDE

Agmin's complex liquid copper algicide product Cupricide® is an economical product that provides effective control of a wide spectrum of filamentous and planktonic algae. It is suitable for use in irrigation canals, farm dams, ponds, ornamental lakes, and potable water supplies.

The Need for Cupricide

In recent years, Australian water supplies have been increasingly threatened by nuisance algae growth caused by excessive amounts of nutrients entering water supplies. These nutrients, originating from agricultural or urban runoff, detergent wastes and/or waste water discharges can enhance the growth of aquatic algae often resulting in unsightly and unmanageable algal blooms. Under serious infestation, algae may accumulate on the surface forming a thick scum. Such algal blooms are not only aesthetically displeasing and detrimental to the intended use of the water but may also present serious health hazards to both humans and animals, e.g., blue green algae. Algae contamination may discolor water, create unpleasant tastes and odors and even impart a distasteful flavor to fish. In addition, once algae die and start to decompose, the process may deplete dissolved oxygen levels in the water thereby threatening fish populations.



Agmin's Cupricide® is an economically viable way to control algae. Supplied in an easy to use (liquid) form, Cupricide® effectively controls the blooming of a broad spectrum of planktonic (suspended) and filamentous (mat forming) algae including Chara, Spirogyra, Cladophora, Vaucheria, Ulothrix, Microcystis, Anabaena, Nodularia and Oscillatoria.

Cupricide® works by systemic action, penetrating the algal cells and inhibiting photosynthesis.

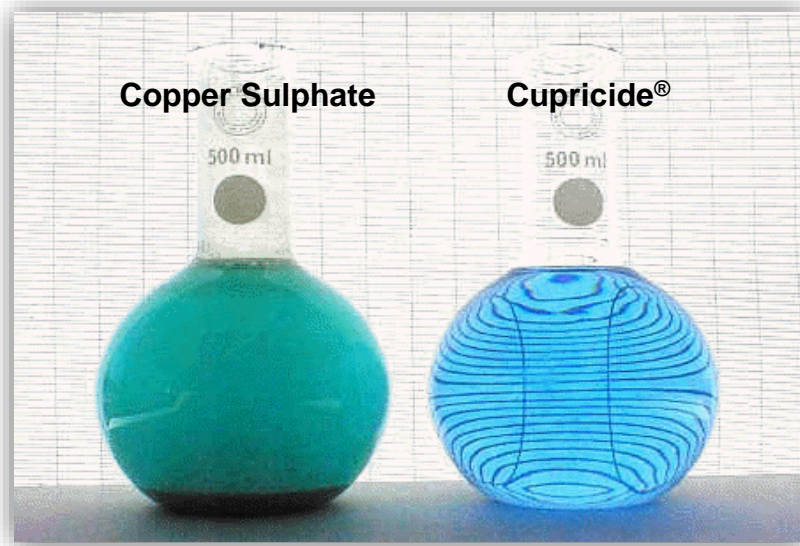
The Benefits of a Chelated Copper Algicide

Agmin's Cupricide® is supplied as a mixed copper alkanolamine complex. In this form, Cupricide® provides maximum algicidal efficiency but with low toxicity to fish. The organic complexing agents used in Cupricide® ensure that the key active ingredient (Copper), remains in solution and does not precipitate out like some other copper algicides, namely copper sulphate. Although copper sulphate has been used extensively throughout Australia as an algicide, it has several drawbacks associated with its use.

Firstly, copper sulphate is not algal specific - in fact it can be quite toxic to other aquatic life, e.g., fish when used at high concentrations. Secondly, if the water contains a high concentration of carbonate ions, the copper ions will preferentially combine with the carbonate ions and form an insoluble precipitate of copper carbonate. This precipitate sinks to the bottom of the water body where it forms a toxic slime.

The formation of this precipitate also renders the copper essentially unavailable for the control of algae. To compensate, higher levels of copper sulphate are used which as stated above may seriously threaten other aquatic life. Finally, sulphate containing algicides also have the disadvantage that they combine with hydrogen ions in aqueous solution to form sulphuric acid which is highly corrosive.

For these reasons Cupricide® is a much more cost effective and efficient product for algae control than copper sulphate.



Precipitate of Copper Carbonate forms in hard water, thus losing Copper algicidal activity.

Cupricide® remains in solution even in hard water, thereby assuring its algicidal activity.

DIRECTIONS FOR USE

For most effective results, Cupricide® should be applied at the first signs of algal bloom. Apply Cupricide® under calm, sunny conditions when the water temperature is at least 15°C. Floating algae mats should be broken up either before spraying or during the application. Shore line areas should be sprayed first to avoid trapping fish.

As the algae die and decompose, dissolved oxygen levels in the water will be depleted. Thus when treating heavy infestations, treat only 1/3 to 1/2 of the water body at a time. This allows the oxygen levels to recover and prevents fish suffocation. The remaining water should be treated 14 days after the initial application.

For more specific instructions on Cupricide® use and safety precautions, please refer to the product label and material safety data sheet.

TYPES OF ALGAE

1. Planktonic Algae

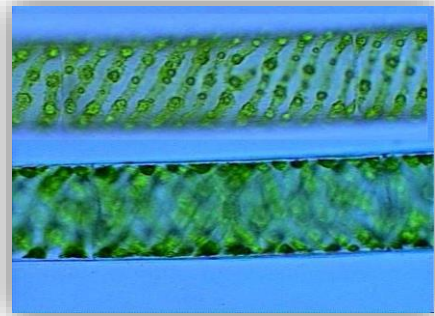
Also known as suspended algae this type includes forms such as Microcystis, Oscillatoria, Anabaena, Euglena, Aphanizomenon. They are generally found suspended in the upper 1 - 1.5m of water imparting a green or brown colour to the water. Some species may be toxic to livestock and wildlife or impart a foul taste to fish. For effective control of planktonic algae, apply Cupricide® to the upper 1 - 1.25m of the water with application rates specified on the label.



Anabaena (magnified)

2. Filamentous Algae.

Filamentous algae such as Spirogyra, Cladophora, Chlorella, or Oedogonium typically form greenish scum mats on the water surface or appear as a furry growth on logs or rocks. For effective control with Cupricide®, large algae mats should be broken up prior to Cupricide® application. Only the upper 1 - 1.5m of the water body needs to be treated using the specified application rates (see label for details).



3. Chara and Nitella

These type of algae are most prevalent in hard water. They may be green, yellow or grey in colour. For best treatment results it is important to apply Cupricide® early in the season using application rates specified on the label.



Withholding Period for Water treated with Cupricide®

(Agmin Newsletter No. 207)

Agmin Cupricide® is a powerful algicide which will kill most forms of planktonic and filamentous algae, including Chara and Nitella. At the concentrations required to affect this algal control, the copper concentration will be in the range of 0.2 – 0.5mg/L (0.2-0.5ppm). This level of copper is not injurious to humans, livestock, fish and aquatic birds.

However, certain algal species, especially blue-green algae, will release powerful toxins from their cell contents, even after the organism has been destroyed. This toxin release stems from the breakdown of the algal cell membrane, which then releases organic toxins contained within the cytoplasm.

These algal toxins consist of large organic molecules which can be broken down in water by:

- Chemical degradation with chlorine,
- Biological degradation, especially in strong sunlight.

A typical withholding period is 7 days or in cases of heavy algal blooms up to 14 days, during which time any organic toxins will have been destroyed.

Residual copper in treated water will not be harmful to live stock and will not be accumulated in the meat.

When large masses of algal cells are killed by treatment with Cupricide®, the decaying vegetable matter may lead to oxygen depletion in the water. This can be rectified by aeration or pumping of the water.

How Long Does Cupricide® Last?

(Agmin Newsletter No. 208)

Agmin's Cupricide® is an effective algicide at a copper concentration of 0.2 – 0.5mg/L in the water body.

The algicidal properties of Cupricide® are usually observed after several days exposure to algal blooms in lakes, ponds, reservoirs and quiescent (slowly moving) waters.

Normally, one application of Cupricide® is sufficient to eradicate an algal infestation; in cases of heavy algal blooms, a second application of Cupricide® may be beneficial after 3-4 weeks, to prevent any re-growth of residual algal cells.

In flowing streams, canals, ditches and irrigation conveyance systems, the copper concentration will be diluted from the recommended concentrations, given above. Under these conditions, it is recommended that Cupricide® is applied weekly for a period of 5 - 6 consecutive weeks to ensure adequate exposure of algae to the desired copper concentration.

Cupricide® Addition Rates

(Agmin Newsletter No. 213)

Agmin Cupricide® is a very efficient Algicide when used at the correct concentration. The active ingredient of Cupricide® is copper, which is bound in a stable complex with organic ligands known as “ethanolamines”. Required copper concentrations are expressed in the range 0.2 – 1.0mg/L (0.2-1.0ppm), depending on the particular species of algae growing in the water body.

Typically, it has been found that only the top 1 metre surface layer of water needs to be treated with Cupricide®. However, in many situations it is desirable to treat the entire water volume in shallow dams, water reservoirs, fishponds and storage tanks. In these applications, we have calculated the addition rates of Cupricide® to treat the entire volume of water, at three copper concentration levels of 0.2, 0.5 and 1.0mg/L. (See Table below).

The water volume can be estimated from the dimensions of the dam or reservoir, by multiplying the three measurements of length x depth x width (in metres); this product in cubic metres (m³) can be converted to litres by multiplying by 1000.

E.g., 10 metre (long) x 4 metres (wide) x 2 metres (deep) = 80m³
Water volume = 80m³ x 1000 = 80,000 litres.

Or for circular water tanks multiply:

Diameter (metres) x Diameter (metres) x Height (metres) x 0.785.

This result is in cubic metres (m³) and can be converted to litres by multiplying by 1000.

E.g., Diameter 3 m tank has 5 m height:

$$3 \times 3 \times 5 \times 0.785 = 35.33 \text{ m}^3$$

Water volume = 35.33 x 1000 { 35,330 litres

Cupricide® Additions Required

Multiply the water volume in cubic metres;

- | | |
|---|-------|
| a) For low intensity algal infestation | 2 mL |
| b) For medium intensity algal infestation | 5 mL |
| c) For high intensity algal infestation | 10 mL |

Water Volume	0.2 mg/L Copper	0.5 mg/L Copper	1.0 mg/L Copper
1000 Litres	2 mL	5 mL	10 mL
5000 Litres	10 mL	25 mL	50 mL
10,000 Litres (10KL)	20 mL	50 mL	100 mL
50,000 Litres (50KL)	100 mL	250 mL	500 mL
100,000 Litres (100KL)	200 mL	500 mL	1000 mL
500,000 Litres (500KL)	1.0 Litres	2.5 Litres	5.0 Litres
1,000,000 Litres = 1 Megalitre	2.0 Litres	5.0 Litres	10.0 Litres
5 Megalitres	10.0 Litres	25.0 Litres	50.0 Litres
10 Megalitres	20.0 Litres	50.0 Litres	100.0 Litres

1 mg/L = 1 ppm Copper
1000 Litres = 1 Kilolitre (KL)
1,000,000 Litres = 1 Megalitre (ML)
1 mg = 10⁻³ grams
1 mL = 10⁻³ Litres

Cupricide[®] Drip System Application in Irrigation Conveyance Systems

(Agmin Newsletter No. 214)

Cupricide[®] can be applied in flowing channels with water flow rates up to 20 Megalitres per hour (20ML/hour). The product Cupricide[®] should be applied as soon as algae begin to interfere noticeably with normal flow of water, e.g., clogging of lateral headgates, suction screens and siphon tanks.

The water flow rate can be estimated using the formula:

$$\text{Average Width (m)} \times \text{Average Depth (m)} \times \text{Velocity (m/s)} \times 3.6 = \text{ML/hour}$$

The dose rate of Cupricide[®] should be maintained for a period of 3 hours at a copper concentration of 1.0mg/L in flowing water. The table below gives some guidelines for the drip rate of Cupricide[®] under various water flow rates in a channel or water conveyance system.

Drip Rate Guide for Cupricide[®]

Water Flow Rate		Cupricide [®] Drip Rate	Volume of Cupricide [®] over 3 hours
ML/hour	ML/day	Litres per hour	Litres
1.0	24.0	9.5	28.5
5.0	120.0	47.5	142.5
10.0	240.0	95.0	285.0
15.0	360.0	142.5	427.5
20.0	480.0	190.0	570.0

The above quantities of Cupricide[®] will provide 1.0mg Copper per litre of flowing water over a 3 hour period, which is generally sufficient to remove susceptible blue-green algae Cyanobacteria.

For intermediate values of flow rates between 1-20ML/hour, the above recommended drip rates of Cupricide[®] should be adjusted by interpolation, on a pro-rata basis.

NRA Cupricide® Algicide Approved Label

STORAGE AND DISPOSAL

KEEP OUT OF REACH OF CHILDREN

Store Cupricide in its original, closed container in a cool, well ventilated area away from foodstuffs, drinking containers or livestock. Do not store for prolonged periods in direct sunlight. Empty containers or waste product should not be used for any other purpose and should not be burnt. Triple or pressure rinse containers before disposal. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush or puncture containers then bury in a local authority landfill. If no landfill is available, bury the containers below 500mm in a disposal pit specifically marked and set up for this purpose that is clear of waterways, desirable vegetation and tree roots.

SAFETY DIRECTIONS

The product may irritate the eyes and skin. Avoid contact with skin and eyes. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

FIRST AID AND EMERGENCY PROCEDURES

If poisoning occurs contact a doctor or the Poisons Information Centre (Phone 131126).

READ SAFETY DIRECTIONS BEFORE OPENING OR USING.

CUPRICIDE

ALGICIDE

Active Constituent: 105 g/L Copper present as mixed Copper-Ethanolamine Complexes

FOR USE IN LAKES – POTABLE WATER RESERVOIRS, FARMS, FISH AND INDUSTRIAL PONDS, FISH HATCHERIES, RICE PADDIES, RACEWAYS, CROP AND NON-CROP, IRRIGATION CONVEYANCE SYSTEMS, DITCHES, CANALS AND LATERALS

Made in Australia by
AGMIN CHELATES PTY. LTD.

ACN 006 413 458

(Incorporated in Victoria)

32 Wattlepark Avenue,
MOOLAP, VICTORIA 3221

Phone: 61-352483828

Email: service@agmin.com.au

Fax: 61-352481603

Website: www.agmin.com.au

24 HRS EMERGENCY NUMBER:

0419 306 666

FREE CALL: 1800 241 184

GENERAL INFORMATION AND TREATMENT NOTES

Under field conditions Cupricide is effective in controlling a wide spectrum of algae including: Chara, Spirogyra, Cladophora, Vaucheria, Ulothrix, Microcystis and Oscillatoria. For planktonic (suspended) algae and free-floating filamentous algae mats, application rates should be based upon treating only the upper 50 to 100cm of water where algae is growing. Under heavy infestation treat only 1/2 to 1/3 of the water body at a time to avoid fish suffocation caused by oxygen depletion from decaying organic matter. Allow 2 weeks for oxygen levels to recover before repeat applications of Cupricide.

Protection of the Environment

- Do not use in water containing trout if the hardness of the water is less than 50ppm.
- Use Cupricide with extreme caution in waters of any hardness containing Australian native fish or crustacea. Cupricide may be toxic to these species and should only be used if the algal infestation is itself posing a serious threat to fish.
- Do not discharge Cupricide treated water into rivers or lakes without the authority of the Environmental Protection Authority.
- Do not treat drinking waters used by farm animals grazing on Heliotrope or Ragwort.
- Do not use on areas where aquatic birds are feeding on algae.
- Water treated with Cupricide is suitable for use on plants eg. watering of sports grounds and ornamental plants.

Disclaimer

Agmin Chelates Pty. Ltd. shall not be subject to any liability with regard to this sale, or the manufacture, storage, handling, application or use of this product whether such liability is implied or imposed by legislation or the general law.

The buyer assumes risk of use of this material when the use is contrary to label instructions. Read and follow label directions carefully.



AGMIN CHELATES pty. Ltd.

CONTENTS: 20 Litres

NRA Approval No. 52384/1099

FRONT

Directions For Use

For most effective results apply CUPRICIDE under calm, sunny conditions when water temperature is at least 15°C. CUPRICIDE should be diluted 1:10 and spray applied to the water surface. Apply in a manner that will ensure even distribution of the chemical within the treatment area. Break up floating algae mats before spraying or while application is being made. Spray shore line areas first to avoid trapping fish.

APPLICATION/USE AREA	ALGAE TYPE	REQ. COPPER CONC Refer Dilution Table Below	APPLICATION COMMENTS
Irrigation canals, farm dams, ponds, ornamental lakes, potable water supplies (excluding rivers, streams, creeks, wetlands, lakes, billabongs)	Planktonic (suspended)	0.2-0.5 mg/L	Reapply after 14 days if required
	Filamentous (mat forming)	0.5-1.0 mg/L	
	Chara/Nitella	0.5-1.0 mg/L	

DILUTION TABLE

Average Water Depth	Amount of CUPRICIDE per 1000 sq. metres for required Copper Content		
	0.2mg/L Copper	0.5mg/L Copper	1.0mg/L Copper
10 cm	190 mls	480 mls	1.0 L
20 cm	380 mls	1.0 L	1.9 L
30 cm	570 mls	1.4 L	2.9 L
40 cm	760 mls	1.9 L	3.8 L
50 cm	1.0 L	2.4 L	4.8 L
60 cm	1.1 L	2.9 L	5.7 L
90 cm	1.7 L	4.3 L	8.6 L

Algal Infestation				Apply as soon as algae appears. Use lower application rates in shallower water and higher rates in deeper water or if blooms are smothering seedlings.
Drill and Aerial Sown Rice	Blue-green algae	2-5 L/Ha		
Preventative Measure	Aerial Sown Rice	Blue-green algae	Average Water Depth	Rate
			Up to 10cm	2 L/Ha
			10 - 15cm	3 L/Ha
		>15cm	4 L/Ha	Apply 7-10 days after sowing. Can be mixed with other herbicide treatments or added as a sole spray. If the latter, ensure Cupricide is mixed with at least 20L of water. Using Cupricide levels lower than recommended will reduce effectiveness.



AGMIN CHELATES pty. Ltd.

NOT TO BE USED FOR ANY OTHER PURPOSE OR IN ANY MANNER CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION

Batch No:
Mfg. Date:
Expiry:

BACK



SAFETY DATA SHEET

Product Name **AGB CUPRICIDE ALGICIDE**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name AGMIN CHELATES PTY LTD
Address 32 Wattlepark Avenue, Moolap, Victoria, AUSTRALIA, 3224
Telephone (03) 5248 3828
Fax (03) 5248 1603
Emergency 0419 306 666
Email service@agmin.com.au
Website www.agmin.com.au

Synonym(s)

Use(s) ALGICIDE

MSDS Date 01 JAN 2018

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO NOHSC CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s)	None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	EPG	None Allocated

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
COPPER CHELATE	Not Available	Not Available	50-60%
ALKANOLAMINE	Not Available	Not Available	30-40%
WATER	H2O	7732-18-5	Remainder

4. FIRST AID MEASURES

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

Inhalation If inhaled, remove from contaminated area. 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 the Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

5. Advice to Doctor Treat symptomatically. **FIRE FIGHTING MEASURES**

Flammability	Non flammable. May evolve toxic gases (copper & sulphur oxides) when heated to decomposition.
Fire and Explosion	Non flammable. Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. 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.
Extinguishing	Non flammable. Prevent contamination of drains or waterways, absorb runoff with sand or similar.
Hazchem Code	None Allocated.

6. ACCIDENTAL RELEASE MEASURES

Spillage	If spilt (bulk), wear splash-proof goggles, PVC/rubber gloves, coveralls and rubber boots. Absorb spill with sand or similar, collect and place in sealable containers for disposal. Prevent spill entering drains or waterways. Caution: Slippery when spilt.
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7. STORAGE AND HANDLING

Storage	Store out of direct sunlight and out of the reach of children, in a cool, dry, well ventilated area, removed from oxidising agents (eg. hypochlorites), acids (sulphuric acid), heat sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Large storage areas should have appropriate ventilation systems. Also store removed from active metals.
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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Stds	No exposure standard(s) allocated.
Biological Limits	No biological limit allocated.
Engineering Controls	Ensure adequate natural ventilation.
PPE	Wear splash-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	VISCOUS BLUE LIQUID	Solubility (Water)	SOLUBLE
Odour	SLIGHT AMMONICAL ODOUR	Specific Gravity	1.29
pH	8 to 9	% Volatiles	NOT AVAILABLE
Vapour Pressure	18 mm Hg @ 20°C	Flammability	NON FLAMMABLE
Vapour Density	3.9	Flash Point	NOT RELEVANT
Boiling Point	103°C	Upper Explosion Limit	NOT RELEVANT
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	> 1	Autoignition Temperature	680°C

10. STABILITY AND REACTIVITY

Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites, peroxides), acids (eg. sulphuric acid), heat and ignition sources. Also incompatible with active metals (eg. aluminium).
Decomposition	May evolve toxic gases (copper & sulfur oxides) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. No adverse health effects are anticipated with normal use. Use safe work practices to avoid eye contact. Due to low vapour pressure, an inhalation hazard is not anticipated.
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in mucous membrane irritation of the nose and throat with coughing.
Skin	Low irritant. Prolonged or repeated contact may result in mild irritation, rash and dermatitis.
Ingestion	Low toxicity. Ingestion may result in nausea, vomiting, abdominal pain and diarrhoea. Ingestion of large quantities may result in liver, kidney and blood damage.
Toxicity Data	No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Environment	SOIL: Copper is found in the earth's crust both in its native state and combined into other minerals. BIOLOGICAL: Positive potential for food chain accumulation. Soluble copper compounds are highly toxic to aquatic and plant life. Insoluble copper compounds are significantly less environmentally hazardous.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	For small amounts, cover with moist sand or similar, collect and dispose of to an approved landfill site. Avoid generating dust. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated	DG Class	None Allocated	Subsidiary Risk(s)	None Allocated
UN No.	None Allocated	Hazchem Code	None Allocated	EPG	None Allocated

15. REGULATORY INFORMATION

Poison Schedule	Classified as a Schedule 6 (S6) Poison using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information

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.

SYNERGISM – ANTAGONISM: Ingredients in this product may act together to aggravate or reduce adverse effects. Accordingly the time weighted average concentration (TWA) provided for single ingredients should be considered as a guide only and all due care exercised when handling.

ABBREVIATIONS:

ADB – Air-Dry Basis.

BEI – Biological Exposure Indice(s).

CAS# - Chemical Abstract Service number – used to uniquely identify chemical compounds.

CNS – Central Nervous System.

EINECS – European Inventory of Existing Commercial Chemical Substances.

IARC – International Agency for Research on Cancer.

M – moles per litre, a unit of concentration.

Mg/m³ – Milligrams per cubic metre.

NOS – Not Otherwise Specified.

NTP – National Toxicology Program.

OSHA – Occupational Safety and Health Administration.

pH – relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm – Parts Per Million.

RTECS – Registry of Toxic Effects of Chemical Substances.

TWA/ES – Time Weighted Average or Exposure Standard.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: 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.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as 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.

Report Status

This document has been compiled by the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product 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.

While **AGMIN CHELATES PTY LTD** 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, **AGMIN CHELATES PTY LTD** 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.

Prepared By

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MSDS Date: 01 JAN 2018

End of Report

For further information on
Agmin Chelates or Cupricide[®]
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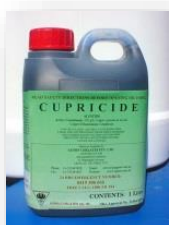
Phone: (03) 5248 3828

Fax: (03) 5248 1603

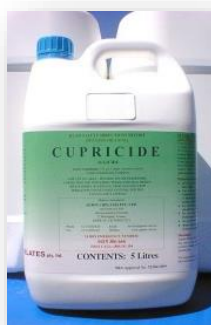
Email: service@agmin.com.au

Website: www.cupricide.com

**Cupricide[®] is available in the following
container sizes...**



1 Litre



5 Litres



20 Litres



200 Litres



1000 Litres