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SAFETY DATA SHEET

according to ST/SG/AC.10/30/REV.10

COPPER PHLOEM ™

SECTION 1: Identification of the substance and of the company

1.1 Product identifier:

Substance

Substance name	:	COPPER PHLOEM ™
Other means of identification	:	Not applicable.
Hazard components for labeling	:	Copper Sulphate

1.2 Relevant Identified uses

Relevant identified uses:	:	Fertilizer
Uses advised against	:	Not for consumption.

1.3 Details of the supplier of the safety data sheet

Supplier

Name	:	Agri Technovation (Pty) Ltd
Address	:	Agri Business Park, 5 Louw Street, Wellington Industrial Area South Africa 7654
Telephone	:	(+27) 21 300 0543 (+64) 27 620 0567
E-Mail	:	info@agritechnovation.co.za

1.4 EMERGENCY TELEPHONE NUMBER

National Poisons and Hazardous Chemicals Information Centre
Dunedin Phone: 0800 POISON (0800 764-766)
24 hr Emergency Response: 0800 CHEMCALL (0800 243 622

SECTION 2: Hazard identification

2.1 Classification of the substance

Classification according to ST/SG/AC.10/30/REV.10	Classification procedure
Acute toxicity, Category 4, oral	Based on concentration threshold
Serious eye damage, Category 1	Based on concentration threshold
Hazardous to aquatic environment, Acute Category 1	Based on concentration threshold
Hazardous to aquatic environment, Chronic Category 1	Based on concentration threshold

2.2 Label elements

Labeling according to ST/SG/AC.10/30/REV.10

Hazard pictograms

Signal word:

Danger

Hazard statements:

Causes serious eye damage. Harmful if swallowed. Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Wash hands thoroughly after handling. Do not eat, drink, or smoke when using this product. IF SWALLOWED: Call a POISON CENTRE or doctor is you feel unwell to specify the appropriate source of emergency medical advice. Rinse mouth. Wear eye protection and face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE to specify the appropriate source of emergency medical advice. Avoid release to environment. Collect spillage. Dispose of contents in accordance with national regulations.

Supplemental Hazard information:

No supplementary hazard information.

Special rules for supplemental label elements for certain mixtures:

None known.

Additional labeling:

Keep out of reach of children.

2.3 Other hazard

None known.

SECTION 3: Composition/ Information on ingredients

3.1 Substances

Not applicable.

3.2 Mixture

Description of the mixture:

Aqueous blend of copper compounds.

Hazardous ingredients

Substance name	CAS number	Concentration	Classification according to ST/SG/AC.10/30/REV.10
Copper Sulphate	7758-99-8	<30%	Acute toxicity, Category 4, oral Serious eye damage, Category 1 Hazardous to the aquatic environment, Acute Category 1 Hazardous to the aquatic environment, Chronic Category 1

This mixture does not, within the current knowledge of the supplier, contain further substances above their cut-off concentration limit fulfilling the criteria of hazard classes according to the ST/SG/AC.10/30/REV.9 regulation or present a health risk below the cut-off concentration limit. Substances that do not fall within classification criteria are not specified in this document to protect confidentiality.

SECTION 4: First aid measured

4.1 Description of first aid measures

General information

Take precautions to ensure your own safety when helping another person. Always wear appropriate personal protective equipment (see Section 8). If medical advice is needed, have Safety Data Sheet or product label at hand and provide treatment already administered.

Following inhalation

Get medical advice if you feel unwell.

Following skin contact

Immediately take off all contaminated clothing, shoes, and leather goods. Rinse skin with plenty of lukewarm, gently flowing water or shower for at least 10 to 20 minutes. Wash contaminated clothing before re-use or discard. If skin irritation occurs: Get medical advice/attention.

Following eye contact

Immediately call a POISON CENTRE, doctor or physician. Rinse the affected eye cautiously with lukewarm, gently flowing water for several minutes, while holding eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 60 minutes or until medical aid is available. Take care not to rinse contaminated water into unaffected eye or onto face.

Following ingestion

If exposed or if you feel unwell, get medical advice.

Self-protection of the first aider:

No additional information.

4.2 Most important symptoms and effects, both acute and delayed.

No information available on this product.

4.3 Indication of any immediate medical attention and special treatment needed.

No information available on this product.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: If possible, use: Carbon Dioxide, foam or dry extinguishing media.

5.2 Special hazards arising from the substance or mixture

Mixture is incombustible but fire may produce: sulphur oxides and metal oxide fumes.

5.3 Advice for fire-fighters

Wear self-contained breathing apparatus and special tightly sealed suit. Cool surrounding containers with water spray. If possible, take container out of danger zone. Shut off sources of ignition. Do not allow runoff to get into sewage system. Rise in pressure and risk of bursting when heating. Contain vapors with water spray.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment, and emergency procedures

Protective equipment

Wear respiratory protection, eye protection, hand protection and body protection.

See section 8.2 of this SDS.

Emergency procedures

Evacuate all individuals. Warn surrounding areas. Isolate the area. Put protective measures in place. Only individuals with suitable personal protective equipment should be allowed into the affected area. Remove the source if safe to do so and provide adequate ventilation in closed spaces. Wash spill area.

6.2 Environmental precautions

Inform the responsible authorities when mixture enters water, drainage, sewer, or the ground.

6.3 Methods and material for containment and cleaning up

For containment

Use suitable closed, labeled containers for disposal in accordance with national and local regulations. The floor must not have a floor drain.

For cleaning up

Use suitable protective equipment while cleaning if necessary. See section 8.2 of this SDS. Wipe clean with cloth or paper towel. Tested industrial vacuum cleaner or suction device can be used as alternative. Use of blower for cleaning is not recommended.

6.4 Reference to other sections

See section 8.2 for information on personal protective.

See section 13 for disposal methods.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures

Heed advice on general occupational hygiene. Fill only into clearly marked containers. Label containers and pipelines clearly. Provide good ventilation in work areas. Used closed apparatus if possible. Washing facility at the workplace is required. Eye bath required. These locations must be sign posted. If release of the product can’t be prevented, then it should be suctioned off at the point of exit.

Fire preventions

Keep away from sources of ignition. Firefighting equipment must be available. Inspect the electrical fittings regularly against the higher risk of corrosion. Keep away from open flames. No welding in working area. Keep away from combustible materials.

Advice on general occupational hygiene

Take care to keep workplace clean and dry. Wear personal protective equipment. Avoid skin contact with product. Do not leave container open.

Wash skin with soap and water before breaks and at the end of work shifts and apply fatty skin-care products after washing. Foods, beverages, and other articles of consumption must not be consumed at the work areas. Suitable areas are to be designated for these purposes. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions

Transport in sealed containers above 4°C. Store in dry, ventilated place in tightly sealed container above 4°C.

Requirements for storage rooms and vessels

Do not use any food containers to prevent a mistake. Containers must be labeled clearly and permanently. Store in the original container as much as possible. Container should be locked up, away from children.

Packaging materials

Glass, PE, PP and PVC.

Materials to avoid

- Pharmaceuticals, foods, and animal feeds including additives.
- Infectious, radioactive und explosive substances.
- Strongly oxidizing substances.
- Most metals

7.3 Specific end uses

See section 1.2. No additional information.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

The mixture does not, within the current knowledge of the supplier, contain substances above their cut-off concentration limit fulfilling the criteria of hazard classes according to the ST/SG/AC.10/30/REV.10 regulation or present a health risk below the cut-off concentration limit other than the materials and hazards listed in this SDS. Substances that do not fall within classification criteria are not specified in this document to protect confidentiality.

8.2 Exposure controls

Appropriate engineering controls

All ventilation should be designed in accordance with OSHA standard. Use local exhaust at filling zones and where leakage and dust formation are probable. Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below limits.

Components with occupational exposure limits

None

Personal protective equipment

Eye / Face protection

Wear glasses with side protection.

Skin protection

Hand protection

Suitable gloves type

The use of resistant protective gloves is recommended. Skin protection cremes do not protect as effectively against the substance as protective gloves.

Suitable material

- Natural rubber/Natural latex - NR (19.7 mil) (use non-powdered and allergen free products)
- Polychloroprene - CR (19.7 mil)
- Nitrile rubber/Nitrile latex - NBR (13.8 mil)
- Butyl rubber - Butyl (19.7 mil)
- Fluoro carbon rubber - FKM (15.7 mil)
- Polyvinyl chloride - PVC (19.7 mil)

In case of doubt contact the gloves' manufacturer.

Wear duration with occasional contact (splash): 8 hours

Be aware that the liquid may penetrate gloves. Frequent change is advisable.

Body protection

Wear an overall or a lab coat

Respiratory protection

In an emergency (e.g.: unintentional release of the substance) respiratory protection must be worn. Use suitable respiratory equipment such as MSHA/NIOSH TC-21C or NIOSH approved respirator with N, R, P or HE filter. Wear respiratory protection during operations where spraying or misting occurs. If respirators are used, a program should be in place to assure compliance with the OSHA Respiratory Protection standard. Wear air supplied respiratory protection if exposure concentrations are unknown.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Viscous liquid **Color** : Light to dark brown

Odor : No specific odour **Odor threshold** : No data available.

	Value	Method	Temperature	Pressure	Remark
pH	2.7 – 3.1	Measured	20 °C	1 atm	100% solution
Melting point/freezing point	Not available.				
Initial boiling point/boiling range	Not available.				

Flash point	Not available.				
Evaporation rate	Not available.				
Flammability (solid, gas)	Not relevant.				
Upper/lower flammability or explosive limits	Not relevant.				
Vapor pressure	Not available.				
Vapor density	Not available.				
Relative density	1.18 – 1.22	Measured	20°C	1 atm	100% solution
Solubility(ies)	100 % soluble in water				
Partition coefficient: n-octanol/water	Not available.				
Auto-ignition temperature	Not relevant.				
Decomposition temperature	Not available.				
Viscosity	Not available.				
Explosive properties	Not relevant.				
Oxidizing properties	Not available.				

9.2 Other information:

Acute effects:

No information on this product.

Chronic effects:

No information on this product.

Substances are not listed in the National Toxicology Program or International Agency for Research on cancer.

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

None known.

10.4 Conditions to avoid:

None known.

10.5 Incompatible materials:

No information available on this product.

10.6 Hazardous decomposition products:

May include: nitrous gases.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Main routes of exposure:

No data available for occupational handling.

Acute toxicity: Data for hazardous substances

Substance	Effect dose/ - concentration	Value	Species
Copper Sulphate	LD50 oral LD50 dermal	482 mg/kg > 2 000 mg/kg	Rat Rat

Other information

No other information.

Assessment Classification

Based on available data, the classification criteria according to ST/SG/AC.10/30/REV.10, the mixture can be classified as Acute toxicity, Category 4, oral.

Hazard classification

Classification	Hazard Description
Acute toxicity	Based on available data, ATEmix was calculated as 1 607 mg/kg. The classification criteria according to ST/SG/AC.10/30/REV.10 results in a Category 4 Acute toxicity oral hazard.
Skin corrosion/irritation	Based on the available data, the classification criteria are not met.
Serious eye damage/irritation	Based on the concentration threshold of the raw materials listed, the mixture is classified as serious eye damage, Category 1.
Respiratory sensitization	Based on available data, the classification criteria are not met.
Skin sensitization	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met.
Reproductive toxicity	Based on the available data, the classification criteria are not met.
STOT – single exposure	Based on available data, the classification criteria are not met.
STOT – repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Based on available data, the classification criteria are not met.

Other information:

None known.

SECTION 12: Ecological information

12.1 Toxicity:

Aquatic toxicity:

Acute (short-term) toxicity to fish

Substance	Effect dose/ - concentration	Value	Test duration	Species
Copper Sulphate	LC50	0.31 mg/l	96 hours	Fathead Minnows Anguilla japonica

Acute (short-term) toxicity to crustacea

Substance	Effect dose/ - concentration	Value	Test duration	Species
Copper Sulphate	EC50	0.06 mg/l	48 hours	Planktonic Crustacea
Copper Sulphate	EC50	0.04 mg/l	48 hours	Daphnia magna

Acute (short-term) toxicity to algae

Substance	Effect dose/ - concentration	Value	Test duration	Species
Copper Sulphate	EC50	0.07 mg/l	72 hours	Selenastrum capricornutum

Assessment / Classification

Based on the ecological aquatic toxicity data and classification criteria in ST/SG/AC.10/30/REV.10, the mixture can be classified as Hazardous to the aquatic environment, Acute Category 1 and Chronic Category 1.

12.2 Persistence and degradability

Not classifiable due to data lacking.

12.3 Bio accumulative potential

Not classifiable due to data lacking.

12.4 Mobility in soil

Not classifiable due to data lacking.

12.5 Results of PBT and vPvB assessment

Not classifiable due to data lacking.

12.6 Other adverse effects:

None known.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

If there is no way of recycling it must be disposed of in compliance with the respective national and local regulations.

Collection of small amounts of product:

Do not put waste into sink or dust bin. Collect in container for toxic, inorganic residues and heavy metals salts and their solution. Adjust product to a pH of 6 – 8. Collection vessels must be clearly labeled with a

systematic description of their contents. Store the vessels in a well-ventilated location. Entrust them to the appropriate authorities for disposal.

SECTION 14: Transport information

UN Number: Not applicable
UN Proper shipping name: Not applicable
Transport hazard class: Not regulated as a dangerous good.
Transport in bulk according to IMO instrument: Not available.
DOT: Not regulated as a hazardous material by DOT.
IATA: Not regulated as a dangerous good.
IMDG: Not regulated as a dangerous good.
Special precautions for user
None known.
Special precautions for user
None known.

SECTION 15: Regulatory information

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

GHS: ST/SG/AC.10/30/REV.10

15.2 Chemical Safety Assessment

No chemical safety assessment was completed for this product.

SECTION 16: Other information

16.1 Indication of changes

First version.

16.2 Abbreviations and acronyms

ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service (division of the American Chemical Society)
DOT	Department of transportation
EC50	Half maximal effective concentration
GHS	Globally Harmonised System
IATA	International Airport Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration required to kill 50% of the population

16.3 Key literature references and sources for data

C&L Inventory - ECHA [WWW Document], n.d. URL https://echa.europa.eu/information-on-chemicals/cl-inventory-database (accessed 11.04.24).
GESTIS Substance database [WWW Document], n.d. URL http://gestis-en.itrust.de/nxt/gateway.dll/gestis_en/000000.xml?f=templates$fn=default.htm$vid=gestiseng:sdbeng$3.0 (accessed 11.04.24).
HAZARD COMMUNICATION: Hazard Classification Guidance for Manufacturers, Importers, and Employers, n.d.

16.4 Classification for mixtures and used evaluation method according to ST/SG/AC.10/30/REV.10

Classification based on calculation or concentration thresholds. See SECTION 2.1 (classification).

16.5 Relevant R-, H- and EUH-phrases (number and full text)

None

16.6 Training advice

Not relevant.

16.7 Further information

This SDS summarizes to the best of our knowledge at the date of issue, the chemical health and safety hazards of the product and general guidance on how to safely handle the material in the workplace.