SAFETY DATA SHEET

Metal Sulfates Formulation

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	22.09.2025	11578995-00001	Date of first issue: 22.09.2025

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Metal Sulfates Formulation

Product code : Minebloom

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Veterinary product

Recommended restrictions on use : Not applicable

1.3 Details of the supplier of the safety data sheet

Company : MSD
20 Spartan Road
1619 Spartan, South Africa

Telephone : +27119239300

E-mail address of person responsible for the SDS : EHSDATASTEWARD@msd.com

1.4 Emergency telephone number

+1-908-423-6000

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H302: Harmful if swallowed.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Carcinogenicity, Category 1B	H350i: May cause cancer by inhalation.
Reproductive toxicity, Category 1B	H360FD: May damage fertility. May damage the unborn child.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H302 + H332 Harmful if swallowed or if inhaled.
H318 Causes serious eye damage.
H350i May cause cancer by inhalation.
H360FD May damage fertility. May damage the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P260 Do not breathe dust.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P305 + P351 + P338 + P310 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 CENTER/ doctor.
P391 Collect spillage.

Hazardous components which must be listed on the label:

Calcium bis(dihydrogenorthophosphate)
Disodium octaborate tetrahydrate
Manganese sulfate
Sodium selenite
Cobalt Chloride

Additional Labelling

EUH208 Contains Sodium selenite, Cobalt Chloride. May produce an allergic reaction.

Restricted to professional users.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
May form explosive dust-air mixture during processing, handling or other means.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Calcium bis(dihydrogenorthophosphate)	7758-23-8 231-837-1	Eye Dam. 1; H318	>= 20 - < 30
Ethylene diamine tetraacetic acid	60-00-4 200-449-4 607-429-00-8	Acute Tox. 4; H332 Eye Irrit. 2; H319	>= 1 - < 10
Sulfuric acid, iron(2+) salt (1:1), monohydrate	17375-41-6	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Irrit. 2; H319	>= 1 - < 10
Disodium octaborate tetrahydrate	12280-03-4 234-541-0 005-020-00-3 01-2119490860-33	Repr. 1B; H360FD	>= 1 - < 10
Manganese sulfate	10034-96-5	Eye Dam. 1; H318 STOT RE 1; H372 (Brain) Aquatic Chronic 2; H411	>= 1 - < 2,5
Copper(II) sulfate, pentahydrate	7758-99-8 029-023-00-4	Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 ——————— M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 1	>= 1 - < 2,5
Zinc sulphate monohydrate	7446-19-7 030-006-00-9	Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 ——————— M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1	>= 1 - < 2,5
Sodium selenite	10102-18-8 233-267-9 034-003-00-3	Acute Tox. 1; H300 Acute Tox. 2; H330 Skin Irrit. 2; H315	>= 0,25 - < 1

		Eye Irrit. 2; H319 Skin Sens. 1; H317 STOT RE 1; H372 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 _____ M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1	
Cobalt Chloride	7646-79-9 231-589-4 027-004-00-5	Acute Tox. 4; H302 Eye Dam. 1; H318 Resp. Sens. 1; H334 Skin Sens. 1A; H317 Muta. 2; H341 Carc. 1B; H350i Repr. 1B; H360F STOT RE 1; H372 (Thyroid, Heart, Blood, Respiratory Tract) Aquatic Acute 1; H400 Aquatic Chronic 1; H410 _____ M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 10	>= 0,025 - < 0,1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

If inhaled : If inhaled, remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Get medical attention.

In case of skin contact	:	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention immediately.
If swallowed	:	If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Risks	:	Harmful if swallowed or if inhaled. Causes serious eye damage. May cause cancer by inhalation. May damage fertility. May damage the unborn child. May cause damage to organs through prolonged or repeated exposure. May produce an allergic reaction.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	:	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Sulphur oxides Metal oxides Oxides of phosphorus Chlorine compounds

Carbon oxides
Nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

6.2 Environmental precautions

Environmental precautions	:	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Surround spill with absorbents and place a damp covering over the area to minimise entry of the material into the air. Add excess liquid to allow the material to enter into solution. Soak up with inert absorbent material. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures	:	Static electricity may accumulate and ignite suspended dust causing an explosion. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Local/Total ventilation	:	If sufficient ventilation is unavailable, use with local exhaust ventilation.
Advice on safe handling	:	Do not get on skin or clothing. Do not breathe dust. Do not swallow. Do not get in eyes. Wash skin thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Keep container tightly closed. Minimize dust generation and accumulation. Keep container closed when not in use. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Do not eat, drink or smoke when using this product. Take care to prevent spills, waste and minimize release to the environment.
Hygiene measures	:	If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep in properly labelled containers. Store locked up. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations.
Advice on common storage	:	Do not store with the following product types: Strong oxidizing agents Self-reactive substances and mixtures Organic peroxides Explosives Gases

7.3 Specific end use(s)

Specific use(s)	:	No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Sulfuric acid, iron(2+) salt (1:1), monohydrate	17375-41-6	OEL-RL	2 mg/m3 (Iron)	ZA OEL
	Further information: Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			
Sodium molybdate (VI) dihydrate	10102-40-6	OEL-RL (respirable dust fraction)	1 mg/m3 (Molybdenum)	ZA OEL
	Further information: Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			
Manganese sulfate	10034-96-5	OEL-RL	0,2 mg/m3 (Manganese)	ZA OEL
	Further information: Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			
		TWA (inhalable fraction)	0,2 mg/m3 (Manganese)	2017/164/EU
		TWA (Respirable fraction)	0,05 mg/m3 (Manganese)	2017/164/EU
Sodium selenite	10102-18-8	OEL-RL	0,4 mg/m3 (selenium)	ZA OEL
	Further information: Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			
		TWA	20 µg/m3 (OEB 3)	Internal
		Wipe limit	200 µg/100 cm²	Internal
Cobalt Chloride	7646-79-9	OEL-RL (inhalable fraction)	0,04 mg/m3 (Cobalt)	ZA OEL
	Further information: Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents, respiratory sensitisation, potential to produce respiratory sensitisation, denotes carcinogenicity, which is based on GHS categorisation, including category 1A, 1B			

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
Cobalt Chloride	7646-79-9	Cobalt: 15 µg/l (Urine)	End of shift at end of workweek	ZA BEI

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Manganese sulfate	Workers	Inhalation	Long-term systemic effects	0,2 mg/m3
	Workers	Skin contact	Long-term systemic effects	2,86 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,043 mg/m3
	Consumers	Skin contact	Long-term systemic	3,33 mg/kg

			effects	bw/day
	Consumers	Ingestion	Long-term systemic effects	0,67 mg/kg bw/day
Sulfuric acid, iron(2+) salt (1:1), monohydrate	Workers	Skin contact	Long-term systemic effects	2,8 mg/kg bw/day
	Consumers	Skin contact	Long-term systemic effects	1,4 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	0,28 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	20 mg/kg bw/day
Potassium chloride	Workers	Inhalation	Long-term systemic effects	1064 mg/m3
	Workers	Inhalation	Acute systemic effects	5320 mg/m3
	Workers	Skin contact	Long-term systemic effects	303 mg/kg bw/day
	Workers	Skin contact	Acute systemic effects	910 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	273 mg/m3
	Consumers	Inhalation	Acute systemic effects	1365 mg/m3
	Consumers	Skin contact	Long-term systemic effects	182 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	910 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	91 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	455 mg/kg bw/day
Silicon dioxide	Workers	Inhalation	Long-term local effects	0,963 mg/m3
Diammonium hydrogenorthophosphate	Workers	Inhalation	Long-term systemic effects	5,9 mg/m3
	Workers	Skin contact	Long-term systemic effects	8,3 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	1,45 mg/m3
	Consumers	Skin contact	Long-term systemic effects	4,17 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	0,42 mg/kg bw/day
Ethylene diamine tetraacetic acid	Workers	Inhalation	Long-term systemic effects	2,5 mg/m3
	Workers	Inhalation	Long-term local effects	2,5 mg/m3
	Consumers	Inhalation	Acute local effects	1,5 mg/m3
	Consumers	Ingestion	Long-term local effects	25 mg/kg bw/day
Disodium octaborate tetrahydrate	Workers	Inhalation	Long-term systemic effects	6,9 mg/m3

	Workers	Skin contact	Long-term systemic effects	326 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	3,5 mg/m3
	Consumers	Skin contact	Long-term systemic effects	163,3 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	0,81 mg/kg bw/day
Sodium selenite	Workers	Inhalation	Long-term systemic effects	0,11 mg/m3
	Workers	Skin contact	Long-term systemic effects	15,33 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,033 mg/m3
	Consumers	Skin contact	Long-term systemic effects	9,42 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	0,00942 mg/kg bw/day
Cobalt Chloride	Workers	Inhalation	Long-term local effects	88,1 µg/m3
	Consumers	Inhalation	Long-term local effects	13,9 µg/m3
	Consumers	Ingestion	Long-term systemic effects	0,120 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Manganese sulfate	Fresh water	1,249 mg/l
	Marine water	0,015 mg/l
	Sewage treatment plant	56 mg/l
	Fresh water sediment	1,587 mg/kg dry weight (d.w.)
	Marine sediment	0,159 mg/kg dry weight (d.w.)
	Soil	40,028 mg/kg dry weight (d.w.)
Potassium chloride	Fresh water	0,1 mg/l
	Marine water	0,1 mg/l
	Intermittent use/release	1 mg/l
	Sewage treatment plant	10 mg/l
Diammonium hydrogenortho-phosphate	Sewage treatment plant	10 mg/l
Ethylene diamine tetraacetic acid	Fresh water	2,2 mg/l
	Marine water	0,22 mg/l
	Intermittent use/release	1,2 mg/l
	Sewage treatment plant	43 mg/l
	Soil	0,72 mg/kg
Disodium octaborate tetrahydrate	Fresh water	2,9 mg/l
	Freshwater - intermittent	13,7 mg/l
	Marine water	2,9 mg/l
	Sewage treatment plant	10 mg/l
	Soil	5,7 mg/kg dry weight (d.w.)
Sodium selenite	Fresh water	0,00585 mg/l

	Marine water	0,00438 mg/l
	Freshwater - intermittent	0,012 mg/l
	Sewage treatment plant	3,285 mg/l
	Fresh water sediment	18 mg/kg dry weight (d.w.)
	Marine sediment	13,6 mg/kg dry weight (d.w.)
	Soil	0,22 mg/kg dry weight (d.w.)
	Oral (Secondary Poisoning)	2,19 mg/kg food
Cobalt Chloride	Fresh water	0,6 µg/l
	Marine water	2,36 µg/l
	Sewage treatment plant	0,37 mg/l
	Fresh water sediment	9,5 mg/kg
	Marine sediment	9,5 mg/kg
	Soil	10,9 mg/kg

8.2 Exposure controls

Engineering measures

The information below is intended for larger pilot/commercial-scale operations and manufacturing. For smaller scale, clinical, or pharmacy settings, site-specific internal risk assessment practices should be conducted to determine appropriate exposure control measures. The health hazard risks of handling this material are dependent on multiple factors, including but not limited to physical form and quantity handled. If applicable, use process enclosures, local exhaust ventilation (e.g., Biosafety Cabinet, Ventilated Balance Enclosures), or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels as low as reasonably achievable.
Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., vacuum conveying from a closed system, packout head with inflatable seal from stationary container, ventilated enclosure, etc.).
All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
Essentially no open handling permitted.
Use closed processing systems or containment technologies.

Personal protective equipment

Eye/face protection : Wear safety glasses with side shields or goggles.
If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Hand protection

Material : Chemical-resistant gloves

Remarks : Consider double gloving.

Skin and body protection : Work uniform or laboratory coat.
Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.
Use appropriate degowning techniques to remove potentially contaminated clothing.

Respiratory protection	:	If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
Filter type	:	Particulates type (P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	solid
Form	:	powder
Colour	:	No data available
Odour	:	No data available
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	May form explosive dust-air mixture during processing, handling or other means.
Flammability (liquids)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Relative density	:	No data available
Density	:	No data available
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		

Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

9.2 Other information

Molecular weight	:	No data available
Particle size	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Not classified as a reactivity hazard.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	May form explosive dust-air mixture during processing, handling or other means. Can react with strong oxidizing agents.

10.4 Conditions to avoid

Conditions to avoid	:	Heat, flames and sparks. Avoid dust formation.

10.5 Incompatible materials

Materials to avoid	:	Oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of exposure	:	Inhalation Skin contact Ingestion Eye contact

Acute toxicity

Harmful if swallowed or if inhaled.

Product:

Acute oral toxicity	:	Acute toxicity estimate: 506,19 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 4,36 mg/l

Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Calcium bis(dihydrogenorthophosphate):

Acute oral toxicity : LD50 (Rat): 3.986 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2,6 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Ethylene diamine tetraacetic acid:

Acute oral toxicity : LD50 (Rat): 4.500 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 1 mg/l
Exposure time: 6 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 412
Remarks: Based on data from similar materials

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Acute oral toxicity : LD50 (Rat): > 300 - 2.000 mg/kg
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 402
Remarks: The test was conducted according to guideline
Based on data from similar materials

Disodium octaborate tetrahydrate:

Acute oral toxicity : LD50 (Rat): 2.550 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat): > 2,01 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Manganese sulfate:

Acute oral toxicity : LD50 (Rat): > 2.000 - 5.000 mg/kg

Remarks: No test guideline followed

Acute inhalation toxicity : LC50 (Rat): > 4,98 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: The test was conducted according to guideline

Copper(II) sulfate, pentahydrate:

Acute oral toxicity : LD50 (Rat): 481 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Zinc sulphate monohydrate:

Acute oral toxicity : LD50 (Rat): > 1.000 mg/kg
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Method: OECD Test Guideline 402
Remarks: Based on data from similar materials

Sodium selenite:

Acute oral toxicity : LD50 (Rat): 4,8 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 0,052 - 0,51 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Cobalt Chloride:

Acute oral toxicity : LD50 (Rat): 537 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Components:

Calcium bis(dihydrogenorthophosphate):

Species : Rabbit
Result : No skin irritation

Ethylene diamine tetraacetic acid:

Species : Rabbit
Result : No skin irritation

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation
Remarks : The test was conducted according to guideline

Disodium octaborate tetrahydrate:

Species : Rabbit
Result : No skin irritation

Manganese sulfate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation
Remarks : The test was conducted according to guideline

Copper(II) sulfate, pentahydrate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Zinc sulphate monohydrate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation
Remarks : Based on data from similar materials

Sodium selenite:

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 431

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 439

Result : Skin irritation

Cobalt Chloride:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

Calcium bis(dihydrogenorthophosphate):

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye

Ethylene diamine tetraacetic acid:

Species : Rabbit
Result : Irritation to eyes, reversing within 21 days

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Result : Irritation to eyes, reversing within 21 days

Disodium octaborate tetrahydrate:

Species : Rabbit
Result : No eye irritation

Manganese sulfate:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye
Remarks : The test was conducted according to guideline

Copper(II) sulfate, pentahydrate:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye

Zinc sulphate monohydrate:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye
Remarks : Based on data from similar materials

Sodium selenite:

Result : Irritation to eyes, reversing within 21 days

Cobalt Chloride:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

Calcium bis(dihydrogenorthophosphate):

Test Type : Local lymph node assay (LLNA)
Exposure routes : Skin contact
Species : Mouse

Method	:	OECD Test Guideline 429
Result	:	negative
Remarks	:	Based on data from similar materials

Ethylene diamine tetraacetic acid:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	negative
Remarks	:	Based on data from similar materials

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative
Remarks	:	The test was conducted according to guideline

Disodium octaborate tetrahydrate:

Test Type	:	Buehler Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	negative

Manganese sulfate:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative
Remarks	:	The test was conducted equivalent or similar to guideline Based on data from similar materials

Copper(II) sulfate, pentahydrate:

Test Type	:	Freund's complete adjuvant test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	negative

Zinc sulphate monohydrate:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Result	:	negative
Remarks	:	Based on data from similar materials

Sodium selenite:

Assessment	:	Probability or evidence of skin sensitisation in humans
Remarks	:	Based on national or regional regulation.

Cobalt Chloride:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of high skin sensitisation rate in humans
Exposure routes	:	inhalation (dust/mist/fume)
Species	:	Humans
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	May cause sensitisation by inhalation.

Germ cell mutagenicity

Not classified based on available information.

Components:

Calcium bis(dihydrogenorthophosphate):

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Remarks: Based on data from similar materials Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials Test Type: in vitro micronucleus test Method: OECD Test Guideline 487 Result: negative Remarks: Based on data from similar materials

Ethylene diamine tetraacetic acid:

Genotoxicity in vitro	:	Test Type: Chromosome aberration test in vitro Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion Method: OECD Test Guideline 474 Result: negative

Remarks: Based on data from similar materials

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: The test was conducted according to guideline
Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative
Remarks: The test was conducted equivalent or similar to guideline

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative
Remarks: The test was conducted equivalent or similar to guideline

Disodium octaborate tetrahydrate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Result: negative
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Manganese sulfate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: The test was conducted equivalent or similar to guideline

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476

Result: negative
Remarks: The test was conducted according to guideline
Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: The test was conducted according to guideline
Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative
Remarks: The test was conducted according to guideline
Based on data from similar materials

Copper(II) sulfate, pentahydrate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Method: Directive 67/548/EEC, Annex V, B.12.
Result: negative

Zinc sulphate monohydrate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative
Remarks: Based on data from similar materials

Sodium selenite:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Cobalt Chloride:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: positive

Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: positive
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse
Application Route: Intraperitoneal injection
Result: positive
Remarks: Based on data from similar materials

Germ cell mutagenicity- Assessment : Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Carcinogenicity

May cause cancer by inhalation.

Components:

Ethylene diamine tetraacetic acid:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	103 weeks
Result	:	negative
Remarks	:	Based on data from similar materials

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	2 Years
Method	:	OECD Test Guideline 451
Result	:	negative
Remarks	:	The test was conducted equivalent or similar to guideline Based on data from similar materials

Disodium octaborate tetrahydrate:

Species	:	Mouse
Application Route	:	Ingestion
Exposure time	:	2 Years
Result	:	negative
Remarks	:	Based on data from similar materials

Manganese sulfate:

Species	:	Rat
Application Route	:	Ingestion

Exposure time	:	103 weeks
Result	:	negative

Zinc sulphate monohydrate:

Species	:	Mouse
Application Route	:	Ingestion
Exposure time	:	1 Years
Result	:	negative
Remarks	:	Based on data from similar materials

Cobalt Chloride:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	105 weeks
Result	:	positive
Remarks	:	Based on data from similar materials

Species	:	Mouse
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	105 weeks
Result	:	positive
Remarks	:	Based on data from similar materials

Carcinogenicity - Assessment	:	Sufficient evidence of carcinogenicity in inhalation studies with animals

Reproductive toxicity

May damage fertility. May damage the unborn child.

Components:

Calcium bis(dihydrogenorthophosphate):

Effects on fertility	:	Test Type: Reproduction/Developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 421 Result: negative Remarks: Based on data from similar materials
Effects on foetal development	:	Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative Remarks: Based on data from similar materials

Ethylene diamine tetraacetic acid:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative Remarks: Based on data from similar materials

Effects on foetal development	:	Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Effects on fertility	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative Remarks: The test was conducted according to guideline
Effects on foetal development	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative Remarks: The test was conducted according to guideline

Disodium octaborate tetrahydrate:

Effects on fertility	:	Test Type: Three-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: positive Remarks: Based on data from similar materials
Effects on foetal development	:	Test Type: Embryo-foetal development Species: Rabbit Application Route: Ingestion Result: positive Remarks: Based on data from similar materials
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, based on animal experiments., Clear evidence of adverse effects on development, based on animal experiments.

Manganese sulfate:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat Application Route: inhalation (dust/mist/fume) Method: OECD Test Guideline 416 Result: negative Remarks: The test was conducted according to guideline Based on data from similar materials

Copper(II) sulfate, pentahydrate:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat

Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

Zinc sulphate monohydrate:

Effects on fertility : Test Type: Fertility
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Sodium selenite:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Mouse
Application Route: Ingestion
Result: negative

Cobalt Chloride:

Effects on fertility : Test Type: Fertility/early embryonic development
Species: Rat
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development
Species: Mouse
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative

Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Components:

Manganese sulfate:

Exposure routes : inhalation (dust/mist/fume)
Target Organs : Brain
Assessment : Causes damage to organs through prolonged or repeated exposure.
Remarks : Based on data from similar materials

Copper(II) sulfate, pentahydrate:

Exposure routes : Ingestion
Assessment : No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

Sodium selenite:

Exposure routes : Ingestion
Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Cobalt Chloride:

Exposure routes : Ingestion
Target Organs : Thyroid, Heart, Blood
Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Exposure routes : inhalation (dust/mist/fume)
Target Organs : Respiratory Tract
Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Repeated dose toxicity

Components:

Calcium bis(dihydrogenorthophosphate):

Species : Rat
NOAEL : > 300 mg/kg
Application Route : Ingestion
Exposure time : 28 Days
Method : OECD Test Guideline 407
Remarks : Based on data from similar materials

Ethylene diamine tetraacetic acid:

Species	:	Mouse
NOAEL	:	>= 500 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Remarks	:	Based on data from similar materials

Sulfuric acid, iron(2+) salt (1:1), monohydrate:

Species	:	Rat
LOAEL	:	> 100 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 Days
Remarks	:	Based on data from similar materials

Disodium octaborate tetrahydrate:

Species	:	Rat
NOAEL	:	> 10 mg/kg
LOAEL	:	> 100 mg/kg
Application Route	:	Ingestion
Exposure time	:	2 yr
Remarks	:	Based on data from similar materials

Species	:	Rat
NOAEL	:	> 0,2 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	10 Weeks
Remarks	:	Based on data from similar materials

Manganese sulfate:

Species	:	Rat, male
NOAEL	:	1.700 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks

Copper(II) sulfate, pentahydrate:

Species	:	Rat
NOAEL	:	17 mg/kg
LOAEL	:	34 mg/kg
Application Route	:	Ingestion
Exposure time	:	92 Days

Zinc sulphate monohydrate:

Species	:	Rat
NOAEL	:	234 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Method	:	OECD Test Guideline 408
Remarks	:	Based on data from similar materials

Sodium selenite:

Species	:	Rat
NOAEL	:	0,88 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks

Cobalt Chloride:

Species	:	Rat
LOAEL	:	5,5 mg/kg
Application Route	:	Ingestion
Exposure time	:	8 Weeks
Remarks	:	Based on data from similar materials

Species	:	Rat
LOAEL	:	< 0,01 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	13 Weeks
Remarks	:	Based on data from similar materials

Aspiration toxicity

Not classified based on available information.

Experience with human exposure

Components:

Manganese sulfate:

Inhalation	:	Target Organs: Brain Symptoms: Tremors, Lack of coordination Remarks: Based on data from similar materials

Sodium selenite:

Inhalation	:	Target Organs: Respiratory Tract Symptoms: Irritation, Oedema Target Organs: Cardio-vascular system Symptoms: Lowered blood pressure Target Organs: Digestive organs Symptoms: Nausea, Vomiting, Irritability
Ingestion	:	Target Organs: Nervous system Symptoms: Neurological disorders Target Organs: Hair Symptoms: hair loss Target Organs: Skin Symptoms: Rash, Skin disorders Target Organs: Endocrine system

SECTION 12: Ecological information

12.1 Toxicity

Components:

Calcium bis(dihydrogenorthophosphate):

Toxicity to fish	:	LC50 (Oryzias latipes (Japanese medaka)): > 100 mg/l

Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 : > 1.000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Ethylene diamine tetraacetic acid:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 159 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 625 mg/l
Exposure time: 24 h

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 1.000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (algae)): 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 : 2,4 mg/l
Exposure time: 24 h

Toxicity to fish (Chronic toxicity) : NOEC: >= 25,7 mg/l
Exposure time: 35 d
Species: Danio rerio (zebra fish)
Method: OECD Test Guideline 210
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 25 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Remarks: Based on data from similar materials

Disodium octaborate tetrahydrate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 380,17 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Ceriodaphnia dubia (water flea)): 443,61 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials EC10 (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to microorganisms	:	NOEC (activated sludge): > 1 mg/l Exposure time: 7 h Remarks: Based on data from similar materials
Toxicity to fish (Chronic toxicity)	:	EC10: 103 mg/l Exposure time: 32 d Species: Pimephales promelas (fathead minnow)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 31,48 mg/l Exposure time: 42 d Species: Hyalella azteca (Amphipod)

Manganese sulfate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 1 - 10 mg/l Exposure time: 96 h Remarks: No test guideline followed
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Hyalella azteca (Amphipod)): > 1 - 10 mg/l Exposure time: 48 h Remarks: No test guideline followed Based on data from similar materials
Toxicity to algae/aquatic plants	:	NOEC (Desmodesmus subspicatus (green algae)): 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: The test was conducted according to guideline ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: The test was conducted according to guideline
Toxicity to microorganisms	:	NOEC (activated sludge): 560 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: The test was conducted according to guideline

Toxicity to fish (Chronic toxicity)	:	NOEC: > 1 mg/l Exposure time: 65 d Species: Oncorhynchus mykiss (rainbow trout) Method: OECD Test Guideline 210 Remarks: The test was conducted equivalent or similar to guideline

Copper(II) sulfate, pentahydrate:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): > 0,01 - 0,1 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 0,01 - 0,1 mg/l Exposure time: 48 h Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0,01 - 0,1 mg/l Exposure time: 72 h Remarks: Based on data from similar materials NOEC (Chlamydomonas reinhardtii (green algae)): > 0,01 - 0,1 mg/l Exposure time: 72 h Remarks: Based on data from similar materials
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to microorganisms	:	EC50 : 7 mg/l
Toxicity to fish (Chronic toxicity)	:	NOEC: > 0,01 - 0,1 mg/l Exposure time: 32 d Species: Oncorhynchus mykiss (rainbow trout) Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: > 0,01 - 0,1 mg/l Exposure time: 7 d Species: Ceriodaphnia dubia (water flea) Remarks: Based on data from similar materials
M-Factor (Chronic aquatic toxicity)	:	1

Zinc sulphate monohydrate:

Toxicity to fish	:	EC50 (Oncorhynchus mykiss (rainbow trout)): 0,384 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0,192 mg/l Exposure time: 48 h Remarks: Based on data from similar materials
Toxicity to algae/aquatic	:	EC50 (Selenastrum capricornutum (fresh water algae)): 0,373

plants		mg/l Exposure time: 96 h Remarks: Based on data from similar materials NOEC (Pseudokirchneriella subcapitata (green algae)): 34,5 µg/l Remarks: Based on data from similar materials
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC: 205,2 µg/l Species: Jordanella floridae (flagfish) Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 415,7 µg/l Species: Daphnia magna (Water flea) Remarks: Based on data from similar materials
M-Factor (Chronic aquatic toxicity)	:	1
Sodium selenite:		
Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): > 1 - 10 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1,2 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Chlamydomonas reinhardtii (green algae)): > 0,1 - 1 mg/l Exposure time: 96 h Remarks: Based on data from similar materials NOEC (Chlamydomonas reinhardtii (green algae)): > 0,1 - 1 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (activated sludge): 180 mg/l Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	NOEC: 0,022 mg/l Exposure time: 258 d Species: Lepomis macrochirus (Bluegill sunfish)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,096 mg/l Exposure time: 28 d
M-Factor (Chronic aquatic	:	1

toxicity)

Cobalt Chloride:

Toxicity to fish	:	LC50 (Oncorhynchus tshawytscha (chinook salmon)): 0,77 mg/l Exposure time: 14 d
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Ceriodaphnia dubia (water flea)): 1,33 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Champia parvula (marine algae)): 0,053 mg/l Exposure time: 72 h EC10 (Lemna minor (common duckweed)): 0,01 mg/l Exposure time: 7 d
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC: 0,748 mg/l Exposure time: 16 d Species: Danio rerio (zebra fish) Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EC10: 0,01 mg/l Exposure time: 28 d Species: Daphnia magna (Water flea) Remarks: Based on data from similar materials
M-Factor (Chronic aquatic toxicity)	:	10

12.2 Persistence and degradability

Components:

Ethylene diamine tetraacetic acid:

Biodegradability	:	Result: Inherently biodegradable. Biodegradation: 80 - 90 % Exposure time: 28 d

12.3 Bioaccumulative potential

Components:

Ethylene diamine tetraacetic acid:

Bioaccumulation	:	Species: Lepomis macrochirus (Bluegill sunfish) Bioconcentration factor (BCF): 1,8 Remarks: Based on data from similar materials
Partition coefficient: n-octanol/water	:	log Pow: 0,13

Cobalt Chloride:

Bioaccumulation	:	Bioconcentration factor (BCF): 724

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Product:

Endocrine disrupting potential	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities. Do not dispose of waste into sewer.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

ADN	:	UN 3077
ADR	:	UN 3077
RID	:	UN 3077
IMDG	:	UN 3077
IATA	:	UN 3077

14.2 UN proper shipping name

ADN	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate, pentahydrate, Zinc sulphate monohydrate)
ADR	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate, pentahydrate, Zinc sulphate monohydrate)

RID	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate, pentahydrate, Zinc sulphate monohydrate)
IMDG	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate, pentahydrate, Zinc sulphate monohydrate)
IATA	:	Environmentally hazardous substance, solid, n.o.s. (Copper(II) sulfate, pentahydrate, Zinc sulphate monohydrate)

14.3 Transport hazard class(es)

		Class	Subsidiary risks
ADN	:	9	
ADR	:	9	
RID	:	9	
IMDG	:	9	
IATA	:	9	

14.4 Packing group

ADN

Packing group	:	III
Classification Code	:	M7
Hazard Identification Number	:	90
Labels	:	9

ADR

Packing group	:	III
Classification Code	:	M7
Hazard Identification Number	:	90
Labels	:	9
Tunnel restriction code	:	(-)

RID

Packing group	:	III
Classification Code	:	M7
Hazard Identification Number	:	90
Labels	:	9

IMDG

Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F

IATA (Cargo)

Packing instruction (cargo aircraft)	:	956
Packing instruction (LQ)	:	Y956
Packing group	:	III
Labels	:	Miscellaneous

IATA (Passenger)

Packing instruction (passenger aircraft)	:	956
Packing instruction (LQ)	:	Y956

Packing group : III
Labels : Miscellaneous

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

IATA (Passenger)
Environmentally hazardous : yes

IATA (Cargo)
Environmentally hazardous : yes

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

The components of this product are reported in the following inventories:

AICS : not determined

CA. DSL : not determined

IECSC : not determined

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information : Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

H300 : Fatal if swallowed.

H302	:	Harmful if swallowed.
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H319	:	Causes serious eye irritation.
H330	:	Fatal if inhaled.
H332	:	Harmful if inhaled.
H334	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	:	Suspected of causing genetic defects.
H350i	:	May cause cancer by inhalation.
H360F	:	May damage fertility.
H360FD	:	May damage fertility. May damage the unborn child.
H372	:	Causes damage to organs through prolonged or repeated exposure.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.
H411	:	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Carc.	:	Carcinogenicity
Eye Dam.	:	Serious eye damage
Eye Irrit.	:	Eye irritation
Muta.	:	Germ cell mutagenicity
Repr.	:	Reproductive toxicity
Resp. Sens.	:	Respiratory sensitisation
Skin Irrit.	:	Skin irritation
Skin Sens.	:	Skin sensitisation
STOT RE	:	Specific target organ toxicity - repeated exposure
2017/164/EU	:	Europe. Commission Directive 2017/164/EU establishing a fourth list of indicative occupational exposure limit values
ZA BEI	:	South Africa. The Regulations for Hazardous Chemical Agents, Biological Exposure Indices
ZA OEL	:	South Africa. The Regulations for Hazardous Chemical Agents, Occupational Exposure Limits
2017/164/EU / TWA	:	Limit Value - eight hours
ZA OEL / OEL-RL	:	Occupational Exposure Limit Restricted limit - 8- hour exposure or equivalent (12 hour shifts)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China;

IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information

Sources of key data used to compile the Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/

Classification of the mixture:		**Classification procedure:**
Acute Tox. 4	H302	Calculation method
Acute Tox. 4	H332	Calculation method
Eye Dam. 1	H318	Calculation method
Carc. 1B	H350i	Calculation method
Repr. 1B	H360FD	Calculation method
STOT RE 2	H373	Calculation method
Aquatic Chronic 2	H411	Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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