

Copper sulphate pentahydrate technical
Date of issue: 04.06.2003
Revision No. / Revision date: 22 / 10.08.2026
SECTION 1. Identification of the substance/mixture and of the company/undertaking
1.1 Product identifier:
Trade name: COPPER SULPHATE PENTAHYDRATE TECHNICAL

Synonyms: copper(II) sulphate pentahydrate

UN-No.: 3077

CAS No.: 7758-99-8

WE No.: 231-847-6

Index No.: 029-023-00-4

REACH registration No.: 01-2119520566-40-0004

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

ES1 (M)	M-1: Copper sulphate manufacture via electrolyte purification processing
ES2 (M)	M-2: Copper sulphate manufacture resulting from metal acidification
ES3 (M)	M-3: Copper sulphate manufacture via chemical synthesis
ES4 (F)	Formulations and re-packaging 1
ES5 (F)	Formulations and re-packaging 2
ES6 (F)	Formulation of end products
ES7 (F)	Formulation of liquid/gel
ES8 (F)	Formulation of end product: Anhydrous copper sulphate
ES9 (F)	Formulation and re-packing; Adhesives
ES10 (F)	Formulation of powder coatings and inks
ES11 (F)	Formulation of solvent borne or water borne liquid coatings and inks
ES12 (F)	Formulation of fertilizer products.
ES13 (F)	Formulation by incorporating fertilizers onto or into a matrix.
ES14 (F)	Formulation or re-packing; Various products-construction chemical products including mortar compounds
ES15 (F)	Formulation of raw material for production of other compounds and fine chemicals.
ES16 (IS)	Adhesives - manufacture and use
ES17 (IU)	Adhesives - industrial manual application; brush and roller
ES18 (IU)	Adhesives - industrial automated application; roller or brushing, indoor
ES19 (IU)	Adhesives - industrial application; reactive adhesives processed (<40°C)
ES20 (IU)	Adhesives - industrial application; reactive adhesives processed (>40°C)
ES21 (IU)	Adhesives - industrial small scale application
ES22 (IU)	Adhesives - industrial large scale spray application; spray booth
ES23 (IU)	Adhesives - industrial large scale spray application; containment
ES24 (IU)	Ceramics (e.g. enamels, ferrites, brick making)
ES25 (IU)	Coatings and inks (includes Photochemicals) - Digital printing with good room ventilation
ES26 (IU)	Coatings and inks - Printing in an enclosed or extracted process
ES27 (IU)	Coatings and inks - Industrial use of aqueous based mixtures for photo processing
ES28 (IU)	Coatings and inks - Industrial use of coatings for inkjet print media
ES29 (IU)	Coatings and inks - Industrial use of coatings for manufacture of photographic media
ES30 (IU)	Coatings and inks - Industrial use of coatings for presensitized plates
ES31 (IU)	Coatings and inks - Industrial non-spray painting, automated/walk-in booth
ES32 (IU)	Coatings and inks - Industrial use of solvent-based inks for digital printing
ES33 (IU)	Coatings and inks - Industrial spray painting, automated/walk-in booth
ES34 (IU)	Coatings and inks - Industrial use of plate processing chemicals for offset printing
ES35 (IU)	Coatings and inks - Industrial use of powder based mixtures for photo processing
ES36 (IU)	Coatings and inks - Industrial use of primer
ES37 (IU)	Coatings and inks - Industrial use of UV inks for digital printing
ES38 (IU)	Coatings and inks - Use of liquid electrophotography inks and water based inks for digital printing
ES39 (IU)	Coatings and inks - Water-based and solvent-based inks; digital printing
ES40 (IU)	Dyes for leather and/or textiles - industrial manufacture and use

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ES41 (IU)	Electroplating and Galvanic (including use in electronics, printed wiring boards, engraving/lithography, metal surface treatment, wire coating).
ES42 (IU)	Fertilizer (industrial manufacture) - Use of a reactive processing aid during formulation of fertilizers or during manufacturing new fertilizer substances.
ES43 (IU)	Fertilizer manufacture - Use of a substance as an intermediate (Fertilizer industry)
ES44 (IU)	Fertilizer (industrial manufacture) - Use of monomers in polymer coating of fertilizers
ES45 (IU)	Glass - industrial manufacture
ES46 (IU)	Laboratory chemicals/reagents, quality control
ES47 (IU)	Laboratory chemicals: use in laboratories (ESIG ESVOC)
ES48 (IU)	Lubricants and greases and release products
ES49 (IU)	Lubricants (ESIG ESVOC)
ES50 (IU)	Manufacture of analytical instrumentation for the in-situ/on-site measurement of pipe corrosion
ES51 (IU)	Non-metal surface treatment
ES52 (IU)	Photochemicals
ES53 (IU)	Photochemicals: use of powder based photochemicals for photo processing
ES54 (IU)	Photochemicals: use of aqueous based photochemicals for photo processing
ES55 (IU)	Photochemicals: use of plate processing chemicals for offset printing
ES56 (IU)	Putties, fillers, construction chemicals
ES57 (IU)	Rubber Production and Processing (ESIG ESVOC)
ES58 (IU)	Rubber and plastics
ES59 (IU)	Industrial downstream use - Yeast production - Industrial site
ES60 (PW)	Widespread use of adhesives by professionals
ES61 (PW)	Widespread large scale application of 2- or multi-component reactive adhesives by professionals
ES62 (PW)	Widespread use large scale application of cementitious based adhesives for tile bonding by professional
ES63 (PW)	Widespread use of ceramics (e.g. enamels, ferrites, brick making) by professionals
ES64 (PW)	Widespread use of coatings and inks by professionals
ES65 (PW)	Widespread use of coatings and inks: aqueous based mixtures for photo processing by professionals
ES66 (PW)	Widespread use of coatings, painting, indoor/outdoor with spray/brush/roller by professionals
ES67 (PW)	Widespread use of coatings and inks: liquid electrophotography inks for digital printing by professionals.
ES68 (PW)	Widespread use of coatings and inks: photographic processing chemicals by professionals
ES69 (PW)	Widespread use of coatings and inks: solvent-based inks for digital printing by professionals
ES70 (PW)	Widespread use of coatings and inks: powder based mixtures for photo processing by professionals
ES71 (PW)	Widespread use of coatings and inks: toner packaging and application by professionals
ES72 (PW)	Widespread use of coatings and inks: UV inks for digital printing by professionals.
ES73 (PW)	Widespread use of coatings and inks: water-based inks for digital printing by professionals
ES74 (PW)	Widespread use of coatings, non-spray painting, near-industrial setting by professionals
ES75 (PW)	Widespread use of coatings, (paints, inks, adhesives, etc) application by hand - by professionals
ES76 (PW)	Widespread use of dyes for leather and/or textiles by professionals
ES77 (PW)	Widespread use of electroplating and galvanic (including use in electronics, printed wiring boards, engraving/lithography, metal surface treatment, wire coating) by professionals
ES78 (PW)	Widespread use of liquid fertilisers by professionals
ES79 (PW)	Widespread use of solid fertilisers by professionals
ES80 (PW)	Widespread use of glass by professionals
ES81 (PW)	Widespread use of laboratory chemicals/reagents, use in laboratories by professionals
ES82 (PW)	Widespread use of laboratory chemicals/reagents, quality control by professionals
ES83 (PW)	Widespread use of formulated lubricants by professionals
ES84 (PW)	Widespread use of lubricants and greases and release products by professionals
ES85 (PW)	Widespread use by professional workers, photographic processing chemicals
ES86 (PW)	Widespread use of putties and fillers by professionals
ES87 (PW)	Widespread use of putties, fillers, construction chemicals by professionals
ES88 (PW)	Widespread use of rubber and plastics by professionals
ES89 (PW)	Use of analytical instrumentation by professionals

Uses advised against: product cannot be publically available.

1.3 Details of the supplier of the material safety data sheet:

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KGHM Polska Miedź S.A.
"Legnica" Copper Smelter & Refinery
Złotoryjska 194
59-220 Legnica

Person responsible for preparing the MSDS: phone No.: (+48 76) 76) 747 82 21, e-mail: karty.charakterystyki@kghm.com

1.4. Emergency telephone number:

Manufacturer (Poland): (+48 76) 747 50 02 – available 24/7

Fire Department (Poland): (+48) 998 – available 24/7

General European Emergency Number: 112 – available 24/7

SECTION 2. Hazards identification**2.1. Classification of the substance or mixture:**

Carc 1A; H350i – May cause cancer by inhalation

Repr 1B; H360D – May damage the unborn child

Acute Tox 4; H302 – Harmful if swallowed

Eye Dam. 1; H318 – Causes serious eye damage

Skin Sens 1; H317 – May cause an allergic skin reaction

STOT RE 2; H373 – May cause damage to organs through prolonged or repeated exposure

Aquatic Acute 1; H400 – Very toxic to aquatic life

Aquatic Chronic 1; H410 – Very toxic to aquatic life with long lasting effects

2.2. Label elements:

"Restricted to professional users".

GHS 05**GHS 07****GHS 08****GHS 09**

Signal Word: "DANGER"

Hazard statements (H):

H350i – May cause cancer by inhalation

H360D – May damage the unborn child

H302 – Harmful if swallowed

H318 – Causes serious eye damage

H317 – May cause an allergic skin reaction

H373 – May cause damage to organs through prolonged or repeated exposure

H400 – Very toxic to aquatic life

H410 – Very toxic to aquatic life with long lasting effects

Precautionary statements (P):

P201 – Obtain special instructions before use.

P202 – Do not handle until all safety precautions have been read and understood.

P280 – Wear protective gloves/protective clothing/eye protection/ face protection

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P308 + P313 – IF exposed or concerned: Get medical advice/attention.

P405 – Store locked up.

P501 – Dispose of contents/container to producer of product.

2.3 Other hazards:

The substance does **not** meet classification criteria for PBT and vPvB.

The substance is **not** a substance identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3. Composition/information on ingredients

3.1. Substances

No.	Name of substance	CAS No. EC No.	Index No.	Content [mass fraction in %]	Hazard Class and Category Code(s)	H statements	Specific Conc. Limit, M-factor, ATE
1.	Copper(II) sulphate pentahydrate $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$	7758-99-8 231-847-6	029-023-00-4	> 85	Acute Tox. 4 Eye Dam. 1 Aquatic Ac. 1 Aquatic Chr. 1	302 318 400 410	oral: ATE = 481 mg/kg bw M = 10 M = 1
2.	Nickel(II) sulphate(VI) $\text{NiSO}_4 \times$ $n \text{H}_2\text{O}$ (n = 1, 3, 4)	7786-81-4 232-104-9	028-009-00-5	0,3 – 0,5	Carc. 1A; Muta. 2; Repr. 1B; STOT RE 1 Acute tox. 4 Acute tox. 4 Skin. Irrit. 2 Resp. Sens. 1 Skin. Sens. 1 Aquatic Ac. 1 Aquatic Chr. 1	H350i H341 H360D H372 H302 H332 H315 H334 H317 H400 H410	STOT RE 1; H372: C ≥ 1 % STOT RE 2; H373: 0,1 % ≤ C < 1 % Skin Irrit. 2; H315: C ≥ 20 % Skin Sens. 1; H317: C ≥ 0,01 % M = 1

3.2. Mixtures

n/a

SECTION 4. First Aid measures

4.1 Description of first aid measures:

Inhalation: Remove the injured person from the exposure area, provide calmness in semi-sitting or sitting position. **Immediate medical help necessary.**

Ingestion: Have the victim drink 2 glasses of water and provoke vomiting. **Immediate medical help necessary.**

Contact with eyes: Immediately rinse with a lot of cool, running water, for about 15 minutes, with eyelid open. Remove contact lenses, if present and easy to do, and continue rinsing. Avoid intensive water jet because conjunctiva may become mechanically damaged. **Immediate medical help necessary.**

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Skin contact: Remove contaminated clothing. Immediately clean contaminated skin with a lot of running cool water. In case of skin changes, seek dermatologist attention.

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

Whole abdominal pain (abdominal colic) may occur, usually preceded by a few days of constipation of stools and an increase in blood pressure. Acute poisoning may result in damage to the liver, kidneys and the peripheral and central nervous system. In chronic poisoning, there may be deficiency anaemia (a decrease in haemoglobin in the blood), changes in the peripheral nerves mainly in the limbs, and changes in the central nervous system.

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

The decision on the rescue procedure is taken by the doctor after a thorough assessment of the victim's condition.

SECTION 5. Firefighting measures

5.1 Extinguishing media:

Suitable extinguishing media: Non-flammable substance. Apply extinguishing media proper for the surrounding materials.

Unsuitable extinguishing media: Not known.

5.2 Special hazards arising from the substance or mixture:

At high temperatures, sulphur dioxide and/or sulphur trioxide and copper oxides may be released.

5.3 Advice for fire-fighters:

Depending on the burning materials. In case of direct fire contact with the substance wear protective, gas-tight clothes and apparatus isolating respiratory ways.

Additional information: Notify those in the surroundings about the fire. Remove all personnel not participating in the breakdown liquidation procedure from the area of hazard. Call fire department or police department.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:

6.1.1 For non-emergency personnel: Do not inhale dusts. Avoid direct contact. In case of choosing evacuation route consider the direction of the dust/fume movement.

6.1.2 For emergency responders: Avoid dust generation, do not inhale dusts. Avoid direct contact. Apply clothing protecting against chemicals as well as eye protection. In case of dust formation, wear dust mask.

6.2 Environmental precautions:

In the event of an accident, do not allow discharge to the environment. Prevent the product from entering sewers. Try to collect as much as possible into suitable containers for disposal. In case of release of large quantities of the product or contamination of the environment, notify the relevant authorities and chemical rescue services.

6.3 Methods and material for containment and cleaning up:

Protect surfaces against spilling of the substance. Liquidate the leak (seal the defective package and put it in the protective package). Collect the spilt substance to container and dispose of as hazardous waste. In the case of solutions, collect the spilled product with absorbents

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(diatomaceous earth, sand or other absorbent material that does not react with the substance) into a closable container.

6.4 Reference to other sections

Personal protection equipment described in section 8. Disposal considerations in section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling:

Avoid generation of vapour/dust at the workplace. Use only small amounts of the substance in a properly marked room with efficient ventilation. Measures to prevent spillage or spillage of the product should be available at the workplace. Containers with the substance should be labeled. Keep containers closed when not in use. Empty containers may contain residues that are hazardous. When handling the product, do not eat, drink or smoke. Wash hands after handling the product, before eating. Do not swallow. The rooms must have adequate exhaust ventilation. The workplace should be equipped with a safety shower (for washing the whole body) and a separate shower (shower) for washing the eyes.

7.2 Conditions for safe storage, including any incompatibilities:

Always store in original, tight, properly labeled packaging, in a cool, dry, well-ventilated storage room, equipped with electrical and ventilation systems. Protect the packaging from damage. Properly identify the storage place with access for authorized, trained personnel only.

7.3 Specific end use(s):

Identified uses are listed in section 1.2.

SECTION 8. Exposure control/personal protection

8.1 Control parameters:

The following current national occupational exposure limit values apply (Poland):

No.	Substance name	TLV-TWA [mg/m ³]	TLV-STEL [mg/m ³]
1.	Copper and its inorganic compounds calculated to Cu	0.2	-
2.	Nickel compounds – calculated to Ni: - inhalable fraction - respirable fraction	0.05 0.01	-

Legal basis:

Regulation of the Minister of Family, Labour and Social Policy of June 12th, 2018 on the highest allowable concentrations and intensities of agents harmful for health at the workplace (Official Journal of 2018 item 1286);

Regulation of the Minister of Family, Labour and Social Policy of March 26th, 2026 amending the Regulation on the highest allowable concentrations and intensities of agents harmful for health at the workplace (Official Journal of 2026 item 447).

Directive of the Commission 91/322/EEG of May 29th, 1991, on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at workplace (Official Journal L 177 of 5.7.1991);

Directive 2000/39/EC - indicative occupational exposure limit values of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the

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protection of the health and safety of workers from the risks related to chemical agents at workplace (Official Journal L 142 of 16.6.2000 with subsequent amendments);

Directive of the Commission 2009/161/EU of December 17th, 2009, establishing the third list of indicative values of occupational exposure in order to execute the Directive 98/241/EC as well as amending the Commission Directive 2000/39/EC (Official Journal L 338 of 19.12.2009);

Copper derived no effect levels:

DNEL (skin, respiratory tract; long-term exposure) - 0.041 mg/kg bw/day;

DNEL (oral; short-term exposure) - 0.082 mg/kg bw/day;

Nickel levels that do not cause adverse changes in the body:

DNEL (inhalation, temporary exposure) - 0.28 mg Ni/m³

DNEL (dermal, long-term exposure) - 0.000044 mg Ni/m³

Copper predicted no-effect levels in the natural environment:

PNEC (surface water) - 7.8 µg/l

PNEC (marine waters) - 5.2 µg/l

PNEC (bottom freshwater sediments) - 87 mg/kg dry weight

PNEC (marine sediments) - 676 mg/kg dry weight

PNEC (soil) - 65.5 mg/kg dry weight

Nickel predicted no-effect levels in the natural environment:

PNEC (surface water) - 7.1 µg/l

PNEC (marine waters) - 8.6 µg/l

PNEC (bottom fresh water sediments) - 109 mg/kg dry weight

8.2 Exposure controls:**8.2.1 Appropriate engineering controls at industrial settings**

In the case of dust emission to the air environment, local exhaust ventilation with casing and general ventilation of the room are necessary. Local ventilation intake openings should be located at the working plane or below. General ventilation vents in the upper part of the room and exhaust vents in its lower part. Processing facilities should be airtight.

8.2.2 Individual protection measures, such as personal protective equipment

Eye/face protection: goggles

Hands protection: necessary - protective gloves against chemicals. Wear protective gloves for chemicals according to EN 374. For specific purposes, it is advisable to check the resistance of the protective gloves to the chemicals mentioned above with the glove manufacturer.

NBR (Nitrile rubber) >0,11 mm > 480 minutes (permeation level: 6)

Preventive skin protection (ointment/cream) is recommended

Skin protection: protective clothing

Respiratory ways protection: necessary in case of dusting - anti-dust half mask of P-3 class

Thermal hazards: not applicable.

Hygiene means: Immediately change contaminated clothing. Decontaminate clothing in water before reuse. Wash your hands and face after working with the substance. Do not eat and drink during substance handling.

8.2.3. Environmental exposure controls:

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Air can only be released into the atmosphere after passing through appropriate dust separators. Waste water generated during the production process and as a result of cleaning operations should be treated in an on-site sewage treatment plant that will ensure sufficient removal of pollutants from it.

Environmental exposure should be controlled in compliance with national environment protection legislation in force.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties:

- a) *Physical state*: a solid with a natural tendency to caking;
- b) *Colour*: bluish to blue;
- c) *Odour*: odourless;
- d) *Melting point/freezing point*: 110 °C;
- e) *Boiling point or initial boiling point and boiling range*: 150 °C;
- f) *Flammability*: n.a. inflammable product;
- g) *Lower and upper explosion limit*: n.a.;
- h) *Flash point*: n.a.;
- i) *Auto-ignition temperature*: n.a.;
- j) *Decomposition temperature*: n.a.;
- k) *pH*: n.a.;
- l) *Kinematic viscosity*: n.a.;
- m) *Solubility*: in water: 423 g/l (20 °C), 2 023 g/l (100 °C); in organic solvents: slightly soluble in alcohols, freely soluble in glycerine.
- n) *Partition coefficient n-octanol/water (log value)*: n.a.;
- o) *Vapour pressure*: n.a.;
- p) *Density and/or relative density*: 2,284 g/cm³ (25 °C)
- q) *Relative vapour density*: n.a.;
- r) *Particle characteristics*: not determined

9.2 Other information:

None

SECTION 10. Stability and reactivity

10.1. Reactivity: Low-reactivity product**10.2. Chemical stability:** The substance is stable under normal conditions.**10.3 Possibility of hazardous reactions:** Not known**10.4 Conditions to avoid:** High temperature**10.5 Incompatible materials:** Strong acids, aluminium, acetylene, nitromethane, hydrazine. Reacts with hydroxylamine. Copper sulphate solutions are acidic and react with magnesium to produce hydrogen.**10.6 Hazardous decomposition products:** copper oxides and sulphur oxides may be produced during a fire or as a result of heating.

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SECTION 11. Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

On the basis of Chemical Safety Report for copper(II) sulfate the product meets the following classification criteria:

a) Acute toxicity:Acute toxicity (oral):

Due to ATE = 481 mg/kg bw for copper sulphate pentahydrate product meets classification criteria as harmful after swallowing (**Acute Tox. 4; H302**).

After swallowing causes sharp pain, nausea, vomits, diarrhea, oral cavity, throat and gullet burns.

Acute toxicity (inhalation):

on the basis of available data the classification criteria are not met.

Acute toxicity (skin contact):

on the basis of available data the classification criteria are not met.

Toxic and lethal doses and concentrations:

LD₅₀ (rat, oral): 482 mg/kg b.w.

LD₅₀ (rat, skin): > 2000 mg/kg b.w.

b) Skin corrosion/irritation:

on the basis of available data the classification criteria are not met.

c) Serious eye damage/ eye irritating:

due to copper(II) sulfate content above concentration limit the product is classified as:

Eye Dam. 1; H318 - causes serious eye damage

d) Respiratory tract or skin sensitization:

due to copper(II) sulfate content above concentration limit the product is classified as:

Skin Sens. 1; H317 - may cause an allergic skin reaction.

e) Germ cell mutagenicity:

on the basis of available data the classification criteria are not met

f) Carcinogenicity:

due to NiSO₄ content above concentration limit the product is classified as:

Carc. 1A; H350 - may cause cancer by inhalation

g) Reproductive toxicity:

due to NiSO₄ content above concentration limit the product is classified as:

Repr. 1B; H360D - May damage the unborn child.

h) Specific target organ toxicity — Single exposure:

on the basis of available data the classification criteria are not met

i) Specific target organ toxicity — Repeated exposure:

due to NiSO₄ content above concentration limit the product is classified as:

STOT RE 2; H373 - May cause damage to organs through prolonged or repeated exposure.

j) Aspiration hazard

on the basis of available data the classification criteria are not met.

Routes of absorption: by inhalation, from the gastrointestinal tract.

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Due to slow absorption through the respiratory tract and gastrointestinal tract and poor absorption through the skin, only very high doses lead to acute cases of poisoning. Chronic absorption causes peripheral muscle weakness, anaemia and central nervous system disorders. It accumulates in the body: mostly in the bones, but also in the kidneys and other tissues.

Information related to possible exposure routes, product properties related symptoms and possible product exposure effects are described in section 4.2.

11.2 Information on other hazards:

None

SECTION 12. Ecological information

12.1. Toxicity:

On the basis of Chemical Safety Report for copper(II) sulfate the product meets classification criteria as very toxic to aquatic life (**Aquatic Acute 1; H400**) and very toxic to aquatic life with long lasting effects (**Aquatic Chronic 1; H410**).

Toxic concentration for aqueous animal and plant organisms:

LC₅₀ (96h), fish: *Pimephales promelas*: 193 µg/l

NOEC (270 d), fish: *Pimephales promelas*: 66 µg/l

EC₁₀ (72 h), algae: *Pseudokirchneriella subcapitata*: 108 µg/l

Cu:

LC₅₀ (48h), crustacea: *Ceriodaphnia dubia*: 14 µg/l

NOEC (42 d), crustacea: *Campelema decisum*: 8 µg/l

12.2. Persistence and degradability:

Is not biodegradable in soil or water, but may contaminate groundwater and surface water.

12.3. Bioaccumulative potential:

The value of the bioconcentration factor for copper sulphate determined in experimental studies is more than 100, indicating the possibility of significant bioaccumulation.

12.4. Mobility in soil: Low mobility in soil and aquatic environment.

12.5. Results of PBT and vPvB assessment: Product is not classified as PBT and vPvB.

12.6. Endocrine disrupting properties:

Not applicable. The substance is **not** a substance identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7. Other adverse effects: Not known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods:

Do not dispose of to sewage system. Do not let the substance to contaminate surface and underground water and soil. Do not dispose of together with municipal waste. Consider the opportunity to reuse. Recovery or disposal should be carried out in accordance with current legislation.

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Waste management according to the Directive of the European Parliament and Council 2008/98/EC of November 19th, 2008 on waste (Official Journal EC L 312 of 22.11.2008, with subsequent amendments).

SECTION 14: Transport information

14.1. UN number or ID number: 3077**14.2. UN proper shipping name:**

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

14.3. Transport hazard class(es): 9**14.4. Packing group:** III,**14.5. Environmental hazards:**

Due to toxic effects on aquatic organisms, means of transport should be labelled with the following pictogram:

**14.6. Special precautions for user:** secure the packages to prevent movement during transport.**14.7. Maritime transport in bulk according to IMO instruments:** n/a

SECTION 15: Regulatory information

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

The substance is not subject to Regulation EC No. 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer (OJ L 244, 29.9.2000 as amended) and Regulation (EC) No. 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC (OJ L 158, 30.4.2004 as amended).

The substance is not subject to Regulation (EC) No 689/2008 of the European Parliament and of the Council of 17 June 2008 concerning the export and import of dangerous chemicals (OJ L 204, 31.7.2008, as amended).

Copper compounds are not listed in Annex X of the Decision No. 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC (OJ L 331, 15/12/2001).

Provisions of law:

Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Commission Delegated Regulation (EU) 2021/849 of 11 March 2021 amending, for the purposes of its adaptation to technical and scientific progress, Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.

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Act of February 25th, 2011 on chemical substances and their mixtures (Official Journal 11.63.322); Regulation (EC) No. 1907/2006 of the European Parliament and Council of December 18th, 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC; Regulation of the European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006; Regulation of the European Parliament and Council (EC) No 1336/2008 of 16 December 2008 amending Regulation (EC) No 648/2004 in order to adapt it to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (Official Journal L 354 from 31.12.2008); Regulation of the Minister of Labour and Social Policy of June 6th, 2014 on the highest allowable concentrations and intensities of substances harmful for health in the work environment (Official Journal No. 817); Act of August 19th, 2011 on transportation of hazardous goods (Official Journal 227.1367); Act of December 14th, 2012, on waste (Official Journal 0.21.2013); Regulation of the Board of Ministers of August 24th, 2004, on the list of works banned for adolescents and conditions of their employing for some works. (Official Journal 04.200.2047, with subsequent amendments).

15.2. Chemical safety assessment

Chemical safety assessment of the copper(II) sulfate has been carried out.

SECTION 16: Other information

Changes made in the MSDS: in section 8.1.

Explanations of abbreviations and acronyms used in the MSDS:

CAS number – means numerical identification assigned to chemical substance by the American organization named Chemical Abstract Service (CAS), enabling substance identification.

Index number – it is an identification code given in part 3 of the annex VI to the Regulation of the European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008, on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;

WE number – the number assigned to chemical substance in EINECS - European Inventory of Existing Chemical Substances, or the number assigned to chemical substance in ELINCS – European List of Notified Chemical Substances or the number in chemical substances inventory included in “No-longer polymers” document.

Registration number – number given by ECHA after substance/intermediate registration by the manufacturer/importer according to REACH Regulation.

UN number – unequivocal marking of hazardous substances and goods assigned by United Nations Central Committee to provide international recognition and use.

IUPAC name – name of a substance given by IUPAC - International Union of Pure and Applied Chemistry Committee

TLV-TWA – the highest admissible concentration/threshold limit value – weighted average value – concentration of toxic chemical whose impact on a worker during 8-hour daily shift and average weekly time of work provided in the Labor Code during the period of his occupational activity

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should not cause negative changes of his health condition and of health condition of his next generations.

TLV-STEL – the highest admissible short term concentration/short term exposure limit – weighted average of concentration of the specified, toxic chemical compound which should not cause negative changes of a worker's health if present in the work environment for not longer than 15 minutes and not more often than twice per shift with occurrences separated by more than 1 hour. and not more often than twice per shift with occurrences separated by more than 1 hour.

LD₅₀ – lethal dose - dose of toxic substance expressed in milligrams per kilogram of body mass necessary to kill 50% of the examined population within specified time.

EC₁₀ – effect concentration - substance concentration expressed in milligrams per litre causing the given pharmacological effect (e.g. inhibition of growth) at 10% of the examined population within specified time.

NOEC - means the highest concentration of a toxic substance at which no adverse effect is observed.

Sources of information used during preparation of the MSDS:

- Own results of qualitative and quantitative analyses of copper sulphate;
- ECHA: <https://echa.europa.eu/pl/information-on-chemicals/registered-substances>;
- TOXNET – Toxicology Data Network (<http://toxnet.nlm.nih.gov/>);

Necessary training: Post-related training within the scope of safe use of a substance considering its hazardous properties for human and the environment.

Information contained in the material safety data sheet is to describe the product within the scope of safety requirements. User is responsible for taking any steps in order to meet the provisions of the national law and to create safe conditions for use of the product. User is held responsible for effects resulting from improper application of this product.

Further information can be obtained under the telephone numbers given in section 1.