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

**1.1. Product identifier**

**1.1.1. Trade name** **Kjeldahl tablets W29**

**1.1.2. Unique Formula Identifier (UFI)**

UFI : 3910-S03Y-P006-RH09

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

**1.2.1. Relevant identified uses**

**1.2.1.1. Use descriptor category**

Use descriptor category:

| | |
|---|---|
| Life cycle stage (LCS) | PW: Widespread use by professional workers |
| Sector of use | SU24: Scientific research and development (analytical chemistry) |
| Technical function | fine chemical |

**1.2.1.2. European product categorisation system (EuPCS)**

EuPCS codes: PC-TEC-19 (Reagents and laboratory chemicals)

**1.2.2. Uses advised against**

not known

**1.3. Details of the supplier of the safety data sheet**

Chemische Fabrik Wülfel GmbH & Co. KG
Hildesheimer Straße 305, D-30519 Hannover, Germany
phone number.: 0049 511 98496-0,
fax number: 0049 511 98406-40
e-mail address of the person responsible for Safety Data Sheet: cfw@wuelfel.de
Web: www.wuelfel.de

**1.4. Emergency telephone number**

00 49 511 98496-0 (Office hours:
Monday - Thursday 8 o´clock a.m. to 4 o´clock p.m.)
or
Poison control centre north (Bremen, Hamburg, Lower Saxony, Schleswig-Holstein)
Tel.: 00 49 551-19 24 0 (24h emergency call)

**SECTION 2: Hazards identification**

**2.1. Classification of the substance or mixture**

**2.1.1. Classification according to Regulation (EC) No 1272/2008 (CLP Regulation)**

Eye Dam. 1; H318,
Aquatic Acute 1; H400,
Aquatic Chronic 1; H410

**2.2. Label elements**

**2.2.1. Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)**

GHS05

GHS09

**Signal word: DANGER**

**Hazard statements**
H318 Causes serious eye damage.
H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statements**
**Prevention:**
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
**Reaction:**
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER/doctor.
P391 Collect spillage.
**Disposal:**
P501 Dispose of contents/container to local waste disposal company or to the manufacturer.

**2.3. Other hazards**
The mixture does not meet the criteria for classification as PBT or vPvB substance.
See also the sections 5, 6, 10, 11, 12, 15

## SECTION 3: Composition/information on ingredients

**3.1. Substances**
The product is a mixture.

**3.2. Mixtures**
A mixture of potassium sulfate and small amounts of copper (II) sulfate pentahydrate and titanium (IV) oxide.

| Chemical name | CAS Nro | EC No | REACH Registration No | % w/w | Classification according to Regulation (EC) No 1272/2008 |
|---|---|---|---|---|---|
| potassium sulfate | 7778-80-5 | 231-915-5 | 01-2119489441-34 | 83.2 | not classified as hazardous |
| titanium (IV) oxide, titanium dioxide | 13463-67-7 | 236-675-5 | 01-2119489379-17 | 8.4 | not classified as hazardous in form of tablets[1)] |

[1)] The classification as a carcinogen by inhalation applies only to mixtures in powder form containing 1 % or more of titanium dioxide which is in the form of or incorporated in particles with aerodynamic diameter ≤ 10 µm.

**3.2.1. Hazardous ingredients**

| Chemical name | CAS Nro | EC No | REACH Registration No | % w/w | Classification according to Regulation (EC) No 1272/2008 |
|---|---|---|---|---|---|
| copper (II) sulfate pentahydrate | 7758-99-8 | 231-847-6 | 01-2119520566-40 | 8.4 (5.37 Copper (II) sulfate) | Acute Tox.4; H302<br>Eye Dam. 1; H318<br>Aquatic Acute 1; H400<br>Aquatic Chronic 1; |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | H410<br>M=10 |

**3.3. Additional information**
The text of H-Statements is given in section 16.

**SECTION 4: First aid measures**
**4.1. Description of first aid measures**
**4.1.1. General informations**
Consult doctor in case of pathological signs.
**4.1.2. In case of eye contact**
Rinse widely opened eye for several minutes (at least 10 min) under running water. Remove contact lenses. It is advisable to use an eyewash. Further treatment by an ophthalmologist.
**4.1.3. In case of skin contact**
Remove contaminated clothing immediately and wash affected areas with soap and water.
**4.1.4. Following ingestion**
Rinse mouth with water and call a doctor! Do not induce vomiting! Encourage to drink water in small sips (dilution effect).
**4.1.5. Following inhalation**
If inhaling abrasive dust remove victim to fresh air.
**4.1.6. Self-protection of the First Aider**
Avoid contact with substance still present.
**4.2. Most important symptoms and effects, both acute and delayed**
Vomiting, irritation of the respiratory tract.
**4.3. Indication of any immediate medical attention and special treatment needed**
Notify a contact with water-soluble copper compounds.

**SECTION 5: Firefighting measures**
**5.1. Extinguishing media**
**Suitable extinguishing media:**
water spray, foam, carbon dioxide or extinguishing powder
**Unsuitable extinguishing media:**
not known
**5.2. Special hazards arising from the substance or mixture**
In a fire corrosive sulfur oxides and hazardous vapors of metal oxides can be released.
**5.3. Advice for firefighters**
Product is non-combustible, fire-extinguishing measures are to be adapted to surrounding.
**The extinguishing water should not enter the sewage system!**

**SECTION 6: Accidental release measures**
**6.1. Personal precautions, protective equipment and emergency procedures**
Avoid formation of dust. Do not eat or drink when handling Kjeldahl tablets. Always wear gloves, goggles and protective clothing.
**6.2. Environmental precautions**
Product should not be discharged into drains or waterways.
**6.3. Methods and material for containment and cleaning up**
Take up mechanically, fill in corrosion-resistant containers and then dispose of it.
**6.4. Reference to other sections**
See sections 4, 7, 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Do not eat or drink when handling Kjeldahl tablets. Use protective gloves, goggles and protective clothing.

### 7.2. Conditions for safe storage, including any incompatibilities

Kjeldahl tablets should be stored dry in tightly closed containers, separate from foodstuffs, beverages and animal feedstocks.
Storage class: 13 (non-combustible solids) according to TRGS 510 (Storage of hazardous substances in nonstationary containers), Annex 4.

### 7.3. Specific end use(s)

For determination of nitrogen by the Kjeldahl method.

### 8.1. Control parameters

*Potassium sulfate and titanium (IV) oxide:*
General limit for dust (TRGS 900 (Technical Rules for Hazardous Substances)):
Inhalable fraction (I dust): 10 mg/m³ (TWA)
Respirable fraction (R dust): 1.25 mg/m³ (TWA)
*Copper and its inorganic compounds:*
The limit value of 0.01 mg/m³ (measured on the respirable fraction) is proposed by the MAK Commission of the German Research Foundation (DFG). The MAK value has no legal binding.

**DNEL** (systemic)
All figures are taken from REACH registration dossiers for potassium sulfate, titanium (IV) oxide and copper sulfate.

| Route | Substance | Worker | General population |
|---|---|---|---|
| Inhalation (Long time exposure) | potassium sulfate | 37.6 mg/m³ | 11.1 mg/m³ |
| | titanium (IV) oxide | no hazard identified[1)] | |
| | copper in water-soluble dusts | Data not provided by the registrant | |
| Dermal (Long time exposure) | potassium sulfate | 21.3 mg/kg bw/day | 12.8 mg/kg bw/day |
| | titanium (IV) oxide | no hazard identified | |
| | copper in dissolved form | Data not provided by the registrant | |
| Oral (Long time exposure) | potassium sulfate | - | 12.8 mg/kg bw/day |
| | titanium (IV) oxide | no hazard identified | |
| | copper in dissolved form | Data not provided by the registrant. | |

[1)] The classification as a carcinogen by inhalation applies only to mixtures in powder form containing 1 % or more of titanium dioxide which is in the form of or incorporated in particles with aerodynamic diameter ≤ 10 µm.

**PNEC**
All figures are taken from REACH registration dossiers for potassium sulfate, titanium (IV) oxide andcopper sulfate.

| Substance | potassium sulfate | titanium (IV) oxide | copper in dissolved form |
|---|---|---|---|
| Freshwater | 0.68 mg/l | | 7.8 µg/l |
| Seawater | 0.068 mg/l | | 5.2 µg/l |
| Sediment | not sufficiently accurate | | 87 mg/kg sediment dw |

| | | | |
|---|---|---|---|
| (Freshwater) | data available | no hazard identified | |
| Sediment (Seawater) | not sufficiently accurate data available | | 676 mg/kg sediment dw |
| Soil | not sufficiently accurate data available | | 65 mg/kg soil dw |

**8.2. Exposure controls**
Ensure good ventilation. Avoid formation of dust.
**8.2.1. Personal protective equipment**
**8.2.1.1. Eye / Face protection**
Safety glasses required.
**8.2.1.2. Respiratory protection**
Required when occurrence of dusts (particle filter P2 according to DIN 3181).
**8.2.1.3. Skin protection**
Chemical protective gloves, e.g. consisting of nitrile rubber (check for damage before use), penetration time (value for permeation: Level 6, > 480 min, EN 374)
**8.2.2. General health and safety measures**
Avoid unnecessary contact with the product.
Wash hands after work, change contaminated clothing.
While using do not eat, drink or smoke.

**SECTION 9: Physical and chemical properties**
**9.1. Information on basic physical and chemical properties**

| | |
|---|---|
| Appearance: | white-blue tablets |
| Weight: | 2.5 g |
| Odour: | odourless |
| Odour threshold: | not applicable |
| pH value (20 °C) | 3.49 (at 50 g/l $H_2O$) |
| Melting point or melting range: | not determined |
| Initial boiling point and boiling range: | not determined |
| Flash point: | not applicable, since mixture of solids |
| Evaporation rate: | not determinable, since vapor pressure too low |
| Flammability: | not applicable, since mixture of inorganic solids |
| Upper/lower flammability or explosive limits: | see the comments on flammability |
| Vapour Pressure | (20 °C): < $10^{-3}$ mbar (< $10^{-1}$ Pa) |
| Vapour density: | not applicable, since vapor pressure too low |
| Density (20 °C): | 2.7 g/$cm_3$ |
| Bulk Density (20 °C): | 1257.9 kg/$m^3$ |
| Solubilities | |
| Solubility in water (20 °C): | 120 g/l |
| Partition coefficient: n-octanol/water (log $K_{OW}$): | not determined, since mixture of inorganic solids |
| Auto-ignition temperature: | not applicable, since inorganic solid |
| Decomposition temperature: | > 560 °C (Copper sulfate) |
| Viscosity: | not applicable, since solid |
| Explosive properties: | not applicable, since stable inorganic solid (insensitive to heat, impact or friction, contains |

| | |
|---|---|
| Oxidising properties: | no chemically unstable or high energetic groups)<br>not applicable, all components contain no oxidizing acting molecule groups |

**9.2. Other information**
Other physical and chemical properties have not been determined.

**SECTION 10: Stability and reactivity**
**10.1. Reactivity**
No specific reactivity.
**10.2. Chemical stability**
No decomposition when used and stored as intended.
**10.3. Possibility of hazardous reactions**
Not known
**10.4. Conditions to avoid**
The contact with moisture.
**10.5. Incompatible materials**
Alkalis and corrosion sensitive metals.
**10.6. Hazardous decomposition products**
If the product is overheated or in a fire corrosive sulfur oxides and vapors of metal oxides hazardous to health can be released.

**SECTION 11: Toxicological information**
**11.1. Information on toxicological effects**
No toxicological data available for the mixture.
**11.1.1. Acute toxicity**
All figures are taken from REACH registration dossiers for potassium sulfate, titanium (IV) oxide and copper sulfate.
Acute oral toxicity
Potassium sulfate: $LD_{50}$ (rat) > 2000 mg/kg bw (OECD Test guideline 425)
Titanium (IV) oxide: $LD_{50}$ (rat) > 5000 mg/kg bw (OECD Test guideline 420)
Copper (II) sulfate: $LD_{50}$ (rat) 481 mg/kg bw (OECD Test guideline 401)
Acute dermal toxicity
Potassium sulfate: $LD_{50}$ (rat) > 2000 mg/kg bw (OECD Test guideline 402)
Copper (II) sulfate: $LD_{50}$ (rat) > 2000 mg/kg bw (OECD Test guideline 402 and EPA OTS 789.1100)
Acute inhalation toxicity
Potassium sulfate: $LC_0$ (rat) 3.6 mg/$m_3$/4h (OECD Test guideline 433 draft), read across to Ammonium sulfate
**11.1.2. Skin corrosion/irritation**
The product can cause skin irritations. But the effect does not meet the criteria for classification.
**11.1.3. Eye damage/irritation**
The product can cause eye damage.
**11.1.4. Sensitisation to the respiratory tract and the skin**
Not known.
**11.1.5. Germ cell mutagenicity**
Not known.
**11.1.6. Carcinogenicity**
Not known.

**11.1.7. Reproductive toxicity**
Not known.
**11.1.8. Specific target organ toxicity (single exposure)**
Not known.
**11.1.9. Specific target organ toxicity (repeated exposure)**
Not known.
**11.1.10. Aspiration hazard**
Not known.

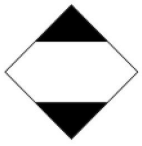
**SECTION 12: Ecological information**
**12.1. Toxicity**
**12.1.1. Acute aquatic toxicity**
All figures are taken from REACH registration dossiers for potassium sulfate and copper sulfate.
**Toxicity to fish**
*Potassium sulfate*
$LC_{50}$ (*Pimephales promelas*, 96 h): 680 mg/l (Test guidelines EPA/600/4-90/027 and EPA/600/6-91/003)
*Copper sulfate*
$LC_{50}$ (*Oncorhynchus mykiss,* 96 h): 190 - 210 µg dissolved copper /l
$LC_{50}$ (*Pimephales promelas*, 96 h): 390 µg dissolved copper /l
**Toxicity to daphnia**
*Potassium sulfate*
$EC_{50}$ (*Daphnia magna,* 48 h): 720 mg/l (Test guidelines EPA/600/4-90/027 and EPA/600/6-91/003)
*Copper sulfate*
$EC_{50}$ (*Daphnia magna*, 48 h): 33.8 - 792 µg/l (OECD Test guideline 202, determined in water of different hardness and pH values of 6.1 and 7.35)
**Toxicity to algae**
*Potassium sulfate*
$EC_{50}$ (*Chlorella vulgaris*, 18 d): 2700 mg/l (read-across to Ammonium sulfate)
*Copper sulfate*
$EC_{r50}$ (*Chlamydomonas reinhardtii, 96* h): 0.047 mg dissolved copper /l (Growth rate) (OECD Test guideline 201)
**12.1.2. Chronic aquatic toxicity**
All figures are taken from REACH registration dossier for copper sulfate.
*Copper sulfate*
NOEC (*Chlamydomonas reinhardtii,* 10 d): 0.022 mg dissolved copper/l (Growth rate) (OECD Test guideline 201)
**12.2. Persistence and degradability**
Copper is not degraded in soil and water sediments, but is enriched by adsorption.
**12.3. Bioaccumulative potential**
Since copper is not biodegradable, it is accumulated in the soil. The bioconcentration factor (BCF) obtained for a variety of plants is in the range of 1 and below.
**12.4. Mobility in soil**
Potassium sulfate has a high mobility due to its good solubility in water.
Titanium (IV) oxide has a low mobility and remains long in soil due to its low solubility in water.
Copper (II) sulfate has a high solubility in water, but it is adsorbed by the soil and it is subsequently immobilized.

**12.5. Results of PBT and vPvB assessment**
Not applicable to inorganic substances.
**12.6. Other adverse effects**
Not known

**SECTION 13: Disposal considerations**
**13.1. Waste treatment methods**
Product residues and the packaging must be disposed in accordance with the Waste Directive 2008/98/EC and national and regional regulations.
The revised list of waste pursuant to article 7 of the Directive was published with the Commission's Decision 2014/955/EU.
**Product**
**Waste key:**
06 03 13 (solid salts and solutions containing heavy metals)
**Packaging**
Contaminated packaging should be disposed of like the product.
**Waste key:**
15 01 10 (packaging containing residues of or contaminated with hazardous substances).

**SECTION 14: Transport information**
**14.1. UN number**
UN3077
**14.2. UN proper shipping name**
**ADR/RID/ADN:**
ENVIRONMENTALLY HAZARDOUS SUBSTANCE; SOLID, N.O.S., (Copper(II) sulfate)
**IMDG-Code:**
ENVIRONMENTALLY HAZARDOUS SUBSTANCE; SOLID, N.O.S., (Copper(II) sulfate)
**ICAO-TI/IATA-DGR:**
Environmentally hazardous substance, solid, n.o.s., (Copper(II) sulfate)
**14.3. Transport hazard class(es)**
9 (Miscellaneous dangerous substances and articles, including environmentally hazardous substances)


Road or rail transport takes place in limited quantities (LQ) in accordance with Chapter 3.4 of the ADR / RID Convention (application of special provision 375).



**14.4. Packing group**
III (Substances presenting low danger)
**14.5. Environmental hazards**
Environmentally hazardous substance:

**ADR/RID/ADN/IMDG-Code:** no
**ICAO-TI/IATA-DGR:** no
This marking applies to all transport routes for transport in limited quantities (LQ).

**14.6. Special precautions for user**
See Sections 6 - 8

**14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code**
Does not apply, it is a solid product and not a bulk good.

**14.8. Additional information**
ADR Tunnel restriction code (-)
The passage through all tunnels is allowed.

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

**15.1.1. EU regulations**
Safety Data Sheet:
Regulation (EC) No 1907/2006 (REACH), Annex II (SDS) amended by Regulation (EU) 2015/830.
Classification and labelling:
Regulation (EC) No 1272/2008 (CLP (EU-GHS) Regulation)
Seveso III
Directive 2012/18/EU
Kjeldahl tablets W29: E1 Hazardous to the aquatic environment, hazard category Acute 1 and Chronic 1

**15.1.2. Basic national regulations (Germany)**
Act for the protection of young people at work (JArbSchG)
Observe employment restrictions according to § 22 for teens.
Act for the protection of mothers at work, in education and in study (MuSchG)
Inadmissible activities and working conditions according to §§ 11 and 12 MuSchG for expectant and nursing mothers.
Act on protection against hazardous substances (Chemicals Act (ChemG))
Regulation on protection against hazardous substances (Hazardous Substances Regulation (GefStoffV))
Regulation on bans and restrictions on the marketing and delivery of certain substances, mixtures and products pursuant to the Chemicals Act (ChemVerbotsV)
Ordinance on facilities for handling substances that are hazardous to water (AwSV) of 18 April 2017.
Potassium sulfate (identification number: 255, see database Rigoletto): Water hazard class (WGK): 1 (slightly hazardous to water)
Titanium (IV) oxide (identification number: 1345, see database Rigoletto) – Water hazard class (WGK): non-hazardous to water (nwg)
Copper sulfate (identification number: 141, see database Rigoletto): Water hazard class (WGK): 3 (highly hazardous to water)
Water hazard class (WGK) of Kjeldahl tablets W29: 3 (highly hazardous to water)
(Derivation: mass fraction of copper sulfate (M factor: 10) ≥ 3%, see AwSV, Annex 1, section 5.2.1 Derivation of water hazard class 3)

**15.2. Chemical Safety Assessment**
For this product a chemical safety assessment was not created.

**SECTION 16: Other information**

**16.1. Indication of changes**

Subsection 1.1. - Extension with a section point and specification of the UFI
Subsection 1.2. - Extension with a section point and specificationnof the EuPCS code
Subsection 3.2. - Information on the hazardous substance properties of titanium (IV) oxide
Subsection 8.1. - Information on the hazardous substance properties of titanium (IV) oxide
Subsection 16.3. - Actualization

**16.2. Codes of the hazard classes and the hazard categories**

**a) Hazard classes and hazard categories in subsection 2.1.1.**

Eye Dam. 1 - Serious eye damage, category 1
Aquatic Acute 1 - Hazardous to the aquatic environment, acute, category 1
Aquatic Chronic 1 - Hazardous to the aquatic environment, chronic, category 1

**b) Hazard statements according to Regulation (EC) No 1272/2008, the text was not specified in section 3**

H400 - Very toxic to aquatic life.
H410 - Very toxic to aquatic life with long lasting effects.
H302 - Harmful if swallowed.
H318 - Causes serious eye damage.

**16.3. Literature and sources**

**Directives and Regulations**

Regulation (EG) Nr. 1907/2006 (REACH), was last amended by Regulation (EU) 2020/171
CLP (EU-GHS)-Verordnung (EG) Nr. 1272/2008, was last amended by Regulation (EU) 2020/217
Directive 2012/18/EU (Seveso III).

**Copper compounds**

Conclusion on the peer review of copper compounds, EFSA Scientific Report (2008)

**REACH registration dossiers**

Copper (II) sulfate (REACH Registration No 01-2119520566-40)
Titanium (IV) oxide (REACH Registration No 01-2119489379-17)
Potassium sulfate (REACH Registration No 01-2119489441-34)

**16.4. Methods in accordance with Chapter 2, Article 9 of Regulation (EC) No 1272/2008 for assessing the information that has been used for the purpose of classification**

Aquatic toxicity: Use of tables 4.1.1 and 4.1.2 of Part I of Annex 4 of Regulation (EC) No 1272/2008.

**16.5. Abbreviations and acronyms**

| | |
|---|---|
| ADN | Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways |
| ADR | Accord européen relatif au transport international des marchandises Dangereuses par Route - European arrangements about the international transport of dangerous goods on the streets. |
| bw | body weight |
| CAS | Chemical Abstracts Service |
| CLP | Classification, Labelling, Packaging |
| DFG | German Research Foundation – Deutsche Forschungsgemeinschaft |
| DIN | German Institute for Standardization Incorporated Society – |

| | |
|---|---|
| | Deutsche Institut für Normung e. V. |
| DNEL | Derived No Effect Level |
| dw | dry weight |
| EC | European Community |
| EC | Effective Concentration |
| $EC_r$ | Effective Concentration (Growth rate) |
| ECHA | European Chemicals Agency |
| EFSA | European Food Safety Authority |
| EN | European Standards |
| EPA | Environmental Protection Agency |
| EU | European Union |
| GHS | Globally Harmonized System of Classification, Labelling and Packaging of Chemicals |
| IATA-DGR | International Air Transport Association-Dangerous Goods Regulation |
| IBC-Code | International code for the construction and the equipment of ships for the transport of dangerous goods as bulk goods. |
| ICAO-TI | International Civil Aviation Organization - Technical Instructions |
| IMDG-Code | International Maritime Code for Dangerous Goods |
| LC | Lethal Concentration |
| LD | Lethal Dose |
| MAK | Maximum Workplace Concentration - Maximale Arbeitsplatzkonzentration |
| MARPOL | Maritime Pollution Convention |
| NOEC | No Observed Effect level Concentration |
| OECD | Organisation for Economic Co-operation and Development (Organisation de coopération et de développement économiques, OCDE) |
| PBT | Persistent, Bioaccumulative, Toxic |
| PNEC | Predicted No Effect Concentration |
| REACH | Regulation, Evaluation and Authorization of Chemicals |
| RID | Règlement concernant le transport International ferroviaire de marchandises Dangereuses - Regulation for the international transport of dangerous goods in the rail transport. |
| TRGS | Technical Rules for Hazardous Substances |
| TWA | Time-Weighted Average |
| UN | United Nations |
| vPvB | very persistent and very bioaccumulative |

**16.6. Further information**

This information is based on our present knowledge, they do not constitute an assurance of product properties and establishes no contract legal rights.