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## SECTION 1. Identification of the substance/mixture and of the company/undertaking

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### 1.1 Product identifier:

**Trade name:** Concentrated sulfuric acid

**IUPAC name:** Sulfuric acid

**UN No.:** 1830

**CAS No.:** 7664-93-9

**WE No:** 231-639-5

**Index number:** 016-020-00-8

**REACH registration No.:** 01-2119458838-20-0041

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

Identified uses: As a solvent for solubilizing of phosphates. For production of dyes, softeners and surfactants. As an electrolyte (battery acid) in lead batteries. Sulfuric acid is one of the most important raw materials in chemical and pulp and paper industry.

Uses advised against: The product cannot be available to the general public.

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

Producer identification: KGHM Polska Miedź S.A.  
„Legnica” Copper Smelter & Refinery  
ul. Żłotoryjska 194  
59-220 Legnica

**Manager of Sulfuric Acid Department: (48 76) 747 55 01** available Monday – Friday, 7<sup>15</sup> - 15<sup>15</sup>

**Manager of Customer Service Section and Warehouse of Finished Products: (48 76) 747 28 00**  
available Monday – Friday, 7<sup>15</sup> - 15<sup>15</sup>

Telefax: (48 76) 747 20 05

Producer’s emergency number (48 76) 747 50 02 available 24/7

Person responsible for MSDS: (48 76) 747 52 06 / e-mail: [karty.charakterystyki@kgbm.pl](mailto:karty.charakterystyki@kgbm.pl)

### 1.4. Emergency telephone number

**112** (general emergency number)

**998** (fire department)

**999** (medical emergency)

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## SECTION 2. Hazards identification

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### 2.1. Classification of the substance or mixture:

Classification according to Regulation No. 1272/2008 (CLP):

**Skin Corr. 1A; H314** - causes severe skin burns and eye damage.

Classification according to Directive 67/548/EWG:

**C; 35** - causes severe burns.

### 2.2. Label elements:

**GHS05**



Signal word: Danger

Hazard statements:

**H314** - causes severe skin burns and eye damage.

Precautionary statements:

**P201** - Obtain special instructions before use.

**P307+314** - IF exposed: Get medical advice/attention if you feel unwell.

**P281** - Use personal protective equipment as required.

**P405** - Store locked up.

**P273** - Avoid release to the environment.

**P501** - Dispose of contents/container to the product producer.

### 2.3 Other hazards:

Oxidizing substance, corrosive, hazardous to the environment. In case of contact with skin or eyes causes severe burns. Inhalation of vapors and aerosols of a substance causes serious respiratory tract damage (TWA=1 g/m<sup>3</sup>, TWA-STEL=3 g/m<sup>3</sup>). Intake can cause serious oral cavity, gullet and stomach burn – can lead to its perforation.

### Contact with combustible materials can cause fire.

Concentrated sulfuric acid destroys many organic substances, especially organic fabrics and textiles. During diluting (add acid to water) it emits large amounts of heat. Adding water to concentrated sulfuric acid can cause explosion. Especially violent, even leading to explosions, are reactions with all bases and base substances. In contact with salts of other acids it displaces them, leading often to explosions (ex. Chlorine oxyacids or emitting toxic gases (ex. Hydrogen chloride from sodium chloride). Sulfuric acid(VI) reacting with most of the metals emits hydrogen or sulfur oxide. In case of leak of substance to water environment it causes its pH decrease, which can lead to death of fish, plants and invertebrates. Because of corrosive properties, sulphuric acid is hazardous to organisms and microorganisms inhabiting soil.

## SECTION 3. Composition/information on ingredients

### 3.1. Substances

a) according to the Regulation No. 1272/2008 (CLP)

Substance name	Percentage content [mass fraction]	Symbols	H statements
<b>H<sub>2</sub>SO<sub>4</sub></b> CAS no.: 7664-93-9 WE no.: 231-639-5 Index no.: 016-020-00-8	Above 94% parts by weight	Skin Corr. 1A	H314
<b>H<sub>2</sub>O</b> CAS no.: 124-38-9 WE no.: 204-696-9	Up to 6% parts by weight		

b) according to Directive No. 67/548/EWG

Substance name	Percentage content [mass fraction]	Symbols	R phrases
<b>H<sub>2</sub>SO<sub>4</sub></b> CAS no.: 7664-93-9 WE no.: 231-639-5 Index no.: 016-020-00-8	Above 94% parts by weight	C	R35
<b>H<sub>2</sub>O</b>	Up to 6% parts by weight		

CAS no.: 124-38-9 WE no.: 204-696-9			
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**3.2. Mixtures**

n/a

**SECTION 4. First Aid measures****4.1 Description of first aid measures:**

Respiratory ways: Take the victim out of the place of exposure. Provide calmness (stillness) in semi-sitting or sitting position. Physical effort may cause lungs edema. Protect against loss of body heat.

**Immediate medical attention is required.**

Eyes contact: Immediately rinse with a lot of cool water, running water preferably, for about 15 minutes. Avoid intensive water jet because conjunctiva may become damaged. Remove contact lenses.

**Immediate medical attention is required.**

Skin contact: Remove clothing, clean the skin with a lot of water, running water preferably. Apply aseptic dressing on burnt places.

**Medical attention is required.**

Alimentary way: Do not induce vomiting. Drink water and do not administer anything else orally.

**Immediate medical attention is required.**

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

Long-term exposure to mists and vapors can cause chronic inflammation of conjunctivas, chronic bronchi inflammation, bleeding from nose, damaging teeth enamel. Long-term exposure to mists containing sulfuric acid can cause neoplastic changes.

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

Sulfuric acid users who do not have own medical emergency services, should have the following medicines nearby the workplace: oxygen, atrovent capsules for inhalation. In case of skin contact, use polyethylene glycol 400.

In case of breathlessness provide oxygen, preferably through a mask. If the injured has hoarseness, wheezing, disability to speak, feeling of breathlessness – provide atrovent from capsule for inhalation, medical treatment is required. If the risk of losing consciousness occurs, lay down and transport in secure recovery position. Use artificial respiration if needed.

**It is essential for the surrounding of work places to have emergency showers available.**

**SECTION 5. Firefighting measures****5.1 Extinguishing media:**

Suitable extinguishing media:

Non-flammable substance. Use extinguishing media proper for the surrounding materials. Water – if there are no acid leakages. In case of acid leaks, use carbon dioxide and extinguishing powders.

Unsuitable extinguishing media:

Water is not recommended because it creates dense, caustic mist when in contact with released acid.

**5.2 Special hazards arising from the substance or mixture:**

Substance in higher temperatures leads to oxidization, it dissolves semi-precious metals releasing hazardous sulfur oxides. Diluted sulfuric acid reacts with iron contained in steel releasing extremely flammable hydrogen.

**5.3 Advice for fire-fighters:**

Personnel participating in extinguishing a fire should wear protective, gas-tight clothes and apparatus isolating respiratory ways. Substance should be removed in gas-tight clothes and apparatus isolating respiratory ways.

General recommendations: inform people in area about the fire. Remove all the people not taking part in fire extinguishing from the area. Contact Fire Department and the Police, if necessary.

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**SECTION 6: Accidental release measures**

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**6.1 Personal precautions, protective equipment and emergency procedures:**

Remove all personnel not taking part in liquidation of damage from the endangered area. Contact Fire Department and the Police, if necessary. Mark the place of damage with warning signs, according to traffic regulations. Protect from wind and rain precipitation.

Use personal protection equipment as described in point 8.

**6.2 Environmental precautions:**

Protect against direct leakage to sewer system, surface and ground water. Protect against dust spreading.

**6.3 Methods and material for containment and cleaning up:**

Greatly diluted acid to be neutralized by sodium bicarbonate or sodium carbonate – rooms should be well ventilated because of carbon dioxide emission. Wash with large amounts of water. Acid of greater condensation to be neutralized by hydrated lime. The post-neutralization mass must be dispose as hazardous waste.

**6.4 Reference to other sections**

Personal protection equipment described in section 8.2.2 Disposal considerations in section 13.

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**SECTION 7. Handling and storage**

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**7.1 Precautions for safe handling:**

Work in well-ventilated rooms. Protect containers and packages with substance against mechanical damage. Protect against direct influence of sunlight, store away from heat, water and other incompatible materials. During dilution always add acid to water, never other way round. During opening metal containers use non-sparkling tools because of possibility of hydrogen presence. Empty acid containers can be hazardous, because they can contain product vapor residues.

While using, do not eat or drink, avoid contact with the substance, avoid inhalation of vapors and mist, preserve personal care rules, use personal protection equipment according to section 8. After handling wash the hands and remove clothing and protective equipment before entering the dining rooms.

**7.2 Conditions for safe storage, including any incompatibilities:**

Sulfuric acid solutions should be stored in special containers. Storing container should have an air vent from the highest point because of possibility of accumulating hydrogen, produced during the contact with metal plate. Containers should be placed on acid-resistant floor.

Containers containing sulfuric acid should be made of materials resistant to this substance, as: steel, acid-proof steel, high density polyethylene. Area of the warehouse should have acid resistant

floor inclined towards sink basins, it should be equipped with available sewage system connected to the acidic sewage treatment plant.

**7.3 Specific end use(s):**

Identified uses are listed in section 1.2.

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**SECTION 8. Exposure control/personal protection**

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**8.1 Control parameters:**

The following current national occupational exposure limit values apply:

TWA: 1 mg/m<sup>3</sup>, TWA-STEL: 3 mg/m<sup>3</sup>

**It is forbidden for adolescents to perform works exposing to corrosive substances.**

Additional information:

Regulation of Minister of Labor and Social Policy from 29th November 2002 concerning highest allowed concentrations and intensities of harmful conditions at the workplace (Dz.U.02.217.1833 as amended); Regulation of Minister of Health from 30th December 2004 concerning safety and hygiene of work connected with presence of chemical substances at the workplace (Dz.U.05.11.86 as amended);

Determination in air at the workplace:

PN-79/Z-04056 sheet 03 Air purity protection. Testing the content of sulfuric acid. Sulfuric acid determination at the workplace in accordance with the titration method.

PN-91/Z-04056 sheet 02 Air purity protection. Testing the content of sulfuric acid and sulfur trioxide. Sulfuric acid and sulfur trioxide determination at the workplace in accordance with the turbidimeter method.

PN-Z-04008-7.2002. Air purity protection – Sampling – Principles of air sampling at workplace and results interpretation.

PN-EN 689:2002 Air at the workplace – Guidelines on evaluation of inhalation exposure to chemicals by comparing with admissible values and measurement strategy.

PN ISO 4225/Ak:1999 Air quality – General issues – terminology (national sheet);

Ventilation requirements: necessary local exhaust ventilation with housing in case of vapor/mist emission to air as well as general ventilation of the room. Sucking holes of the local ventilation to be located at working surface or below. Intake ventilators of the general ventilation in upper part of the room and uptake ventilators in lower part.

**8.2 Exposure controls:**

Appropriate engineering controls at industrial settings: Necessary local exhaust ventilation with housing in case of vapor/mist emission to air as well as general ventilation of the room. Sucking holes of the local ventilation to be located at working surface or below. Intake ventilators of the general ventilation in upper part of the room and uptake ventilators in lower part.

Individual protection measures, such as personal protective equipment: Wear acid-proof protective clothing, including boots, apron or coveralls to prevent from skin contact. If there is a possibility of contact with eyes use protective goggles or/and full face protection.

In case of emergency, if the substance concentration is not known, apply personal protection equipment of the highest recommended class of protection. Protective clothing from materials coated with viton, butyl rubber or hypalon; gloves and boots from natural rubber (concentration of acid up to 20%), PVC (concentration above 20%); goggles protecting from drops of liquid (in case of using a half- mask); P2 class filter after matching with a mask or a half-mask; if the concentration of

substance is higher than 100 NDS or there is a deficit of oxygen in the air, use viton, butyl rubber or hepalon covered and apply gastight clothing with breathing apparatus.

Other recommended measures:

Rooms should be equipped with showers and eye washers.

Individual protection measures in emergency, unsealing of installation and direct contact with substance situations:

- Respiratory protection: Required, when there are vapors/aerosols creating – gas mask (absorber for acid vapors);
- Eye protection: Required – protective goggles;
- Hands protection: Required – protective gloves;
- Skin protection: Required – acid-proof;
- Protective and hygiene measures: change contaminated clothing, dip in water. Wash hands and face after handling the substance. Using a barrier skin cream is recommended.

Other information: When concentration of the substance is established and known, selection of personal protection equipment must consider concentration present at the workplace, exposure time and operations performed by a worker as well as guidelines given by the personal protection equipment manufacturer.

In case of emergency, if the substance concentration is not known, apply personal protection equipment of the highest recommended class of protection. Protective clothing from materials coated with viton, butyl rubber or hypalon; gloves and boots from natural rubber (concentration of acid up to 20%), PVC (concentration above 20%); goggles protecting from drops of liquid (in case of using a half- mask); P2 class filter after matching with a mask or a half-mask; if the concentration of substance is higher than 100 NDS or there is a deficit of oxygen in the air, use viton, butyl rubber or hepalon covered and apply gastight clothing with breathing apparatus.

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## **SECTION 9. Physical and chemical properties**

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### **9.1 Information on basic physical and chemical properties:**

Appearance: colorless liquid (20 °C)

Odour: no smell

Odor threshold: not applicable

pH: strong acid

Melting point: -13.89 to -10 °C for 96% acid

Boiling point: about 330 °C for 96% acid Ignition temperature: not applicable

Self-ignition temperature: not applicable

Evaporation: not applicable

Flammability: not applicable

Explosive point: not applicable

Vapor pressure: 6 Pa for 90% acid (20 °C)

Vapor density: not applicable

Relative density: about 1.8355 g/cm<sup>3</sup> (20 °C) for 96% acid

Solubility:

- In water: soluble (caution! Produces large amounts of heat)
- In organic solvents: not applicable

Partition coefficient n-octanol/water: not applicable

Self-ignition point: not applicable  
Decomposition temperature: not applicable  
Viscosity: 22,5 cP (20 °C) for 96% acid  
Explosive properties: not applicable  
Oxidizing properties: not applicable

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**SECTION 10. Stability and reactivity**

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**10.1. Reactivity:**

Corrodible. Is a chemically active compound. Product is not explosive and pyrophoric, but reaction can be very violent and can have properties of explosions. In reaction with metals hydrogen produces intensively, which, combined with the air, creates explosive mixtures.

**10.2. Chemical stability:**

Sulfuric acid is stable under normal use and storage conditions.

**10.3 Possibility of hazardous reactions:**

Concentrated solutions react violently with water, splashing, producing heat and corrosive vapors. In reaction with carbonates carbon dioxide releases, with cyanides and sulfides creates toxic hydrogen cyanide and sulfane. In reactions with metals there is an intensive hydrogen emission.

**10.4 Conditions to avoid:**

Heat, moisture, low temperatures.

Protect from direct influence of sunlight, store far from heat, water and other incompatible materials sources. During diluting, always add acid to water, never the other way round.

**10.5 Incompatible materials:**

Water, potassium chlorate, potassium perchlorate, potassium, sodium, lithium, base, organic materials, halogens permanganate, acetylides of metals, oxides and hydrides, metals (hydrogen emission), highly oxidizing and reducing and many other reactive substances.

**10.6 Hazardous decomposition products:**

Toxic vapors of sulfur oxide release, after heating to decomposition. In reaction with water or vapor, toxic and corrosive vapors appear. In reaction with carbonates carbon dioxide with cyanides and sulfides produces, it creates toxic hydrogen cyanide and hydrogen sulfide.

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**SECTION 11. Toxicological information**

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**11.1 Information on toxicological effects:**Toxicological data:

Oral toxicity, LD<sub>50</sub> rat: 2140 mg/kg,

Inhalation, LC<sub>50</sub> rat: 510 mg/m<sup>3</sup>/2H

Irritating to eyes: rabbit 250 µg (strongly)

Hazard classes

Irritating to skin category 1A: Causes serious skin burns and eye damage.

Literature data:Routes of exposure:

Through respiratory tract, digestive system, eye and skin contact.

Acute intoxication symptoms:

Activity through respiratory tract:

Product in form of mist and smoke causes pain, eye weeping, conjunctiva and cornea burns, throat ache, coughing, contraction of glottis, edema of larynx, bronchus contraction, lungs edema. Glottis contraction may result in death; causes air passages burns.

Digestive system:

Causes burns of oral cavity, throat, gullet, stomach, thirstiness, nausea, vomiting, diarrhoea, digestive tract bleeding, shock. Deadly dose: 6-8g.

Skin contact:

Causes thermal and chemical burns, redness, stinging; degree of burning depends on concentration and time of exposure.

Contact with eyes:

Causes serious eyelids and eyeball burns and permanent damage, redness, stinging, pain; can cause losing of sight or permanent cornea turbidity.

Results of chronic exposure:

Prolonged exposure to mists or vapors can cause chronic conjunctivitis, chronic bronchitis, bleeding from nose, damaging teeth enamel. Prolonged exposure to mists containing sulfuric acid can cause neoplastic changes.

**Lethal and toxic concentrations and doses:**

LD<sub>50</sub> (oral, rat) 2140 mg/kg (as 25% solution)

LC<sub>50</sub> (rat, inhalation) 375 mg/m<sup>3</sup>

LC<sub>50</sub> (rat, inhalation) 18 mg/m<sup>3</sup> (8h)

LC<sub>50</sub> (guinea pig, inhalation) 50 mg/m<sup>3</sup> (8h)

LC<sub>50</sub> (rat, inhalation) 347 ppm (1h)

NOEC (rat, inhalation) 100 mg/m<sup>3</sup> (2-28 days)

NOEC (rat, inhalation) 10 mg/m<sup>3</sup> (6hours/ day/ 5 days/ week/ 6 months)

LOEC (rabbit, inhalation) 0.5 mg/m<sup>3</sup> (1h/ day/ 14 days)

LOEC (dog, inhalation) 0.9 mg/m<sup>3</sup> (21h/ day/ 620 days)

TCL<sub>0</sub> (human, inhalation) 3 mg/m<sup>3</sup> (24 weeks)

Inhalation pathways: through respiratory tract, from the digestive system.

Acute poisoning symptoms: as a mist and smoke causes pain, eye weeping, conjunctiva, cornea burns, throat ache, coughing, faster breathing, breathlessness, glottis contraction, edema of larynx, bronchus contraction, lungs edema.

Death can be caused by glottis contraction. Skin contamination causes thermal and chemical burns. Causes serious eyelids and eyeball burns and permanent damage. Through digestive system can cause burns of oral cavity, throat, gullet, stomach, digestive tract bleeding, shock.

Toxic and other harmful effects on human body: prolonged contact with sulfuric acid can be the cause of chronic conjunctivitis, chronic bronchitis, bleeding from nose. Repeated skin exposure can cause ulceration, finger nails change.

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## **SECTION 12. Ecological information**

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### **12.1. Toxicity:**

LC<sub>50</sub> flatfish 100 do 330 mg/l/48 h fresh waters

LC<sub>50</sub> shrimp 80 do 90 mg/l/48 h fresh waters

LC<sub>50</sub> prawn 42.5 ppm/48 h salty waters

Toxic for water organisms.



**12.2. Persistence and degradability:**

Reacts with water vividly causing heat emission.

**12.3. Bioaccumulative potential:**

No data

**12.4. Mobility in soil:**

Soluble in water in any amount. Released to soil may reach underground water.

**12.5. Results of PBT and vPvB assessment:**

Not available.

**12.6. Other adverse effects:**

Causes carbonization of organic substance and destroys plant and animal tissues.

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**SECTION 13: Disposal considerations**

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**13.1. Waste treatment methods**

Waste classification: Waste code: 06 01 01 – sulfurous and sulfuric acid (dangerous waste).

Do not dispose to sewage system, do not allow to contamination of ground waters and soil.

Recovery or disposal carried out in accordance with applicable regulations.

Proceedings in case of occurring of waste at user's place: Do not dispose to sewer system. Do not allow to contamination of ground waters and soil. Do not dispose on municipal dumps. Consider reusing. Recycling and rendering harmless should be performed according to binding regulations. Physicochemical transformation as a recommended way of rendering harmless. Acid is best neutralized with 10% hydrated lime.

Legal basis:

European Parliament and Council Regulation from 5th April 2006 concerning waste (EU Official Journal 114 z 27.04.2006, as amended).

Waste Regulation from 27.04.2001 (Official Journal 2010.185.1243 and Official Journal 2010.203.1351 as amended).

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**SECTION 14: Transport information**

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**14.1. UN number:** 1830

**14.2. UN proper shipping name:** SULFURIC ACID with more than 51 percent acid;

**14.3. Transport hazard class(es):** RID/ADR: 8 / C1;

**14.4. Packing group:** RID/ADR: II; **Packaging instructions:** ADR: P001, IBC02, MP 15; RID: L4BN

**14.5. Environmental hazards:** Not hazardous.

**14.6. Special precautions for user:** No special preventive measures.

**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** n/a

**Hazard label:** 8



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**SECTION 15: Regulatory information**

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

Sulfuric acid is in precursor register of category 3 of European Parliament and Council Regulation (WE) no. 273/2004 from 11th February concerning narcotics (Dz. U. WE L 47 z 18.2.2004 as amended).

The substance is not affected with directives of Regulation WE no. 2037/2000 of European Parliament and Council concerning substances destroying ozone layer (Dz.U. L 244 z 29.9.2000 as amended) and Regulation (WE) no. 850/2004 of European Parliament and Council from 29th April 2004 concerning permanent organic contaminants and changing the regulation 79/117/EWG (Dz.U. L 158 z 30.4.2004 as amended).

The substance is not subjected to directives of Regulation of European Parliament and Council (WE) no. 698/2008 from 17th June 2008 concerning the transport of dangerous chemicals (Dz.U. L 204 z 31.7.2008 as amended).

Category of substance according to regulation Seveso/substances listed in appendix I to regulation of Council 96/82/WE: dangerous for environment.

The substance is not listed in Appendix X to Decision no. 2455/2001/WE of European Parliament and Council from 20th November

2001 setting the list of priority substances concerning water politics and changing the Regulation 2000/60/WE (Dz. U.WE L 331, 15/12/2001).

#### Legal regulations:

Regulation (WE) of European Parliament and Council from 18th December 2006 concerning registration, assessment, granting permissions and used limitations concerning chemicals (REACH), creating of European Chemicals Agency, changing the Regulation 199/45/WE and revoking the regulation of the Council (EWG) no. 793/93 and regulation of the Committee (WE) no. 1488/94, and also regulation of the Council 76/769/EWG and regulations of the Committee 91/155/EWG, 93/67/EWG, 93/105/WE i 2000/21/WE; Regulation of European Parliament and Council WE no. 1272/2008 from 16th December 2008 concerning classification, marking and packaging of substances and mixtures, changing and revoking regulations 67/548/EWG i 1999/45/WE and changing the directive (WE) no. 1907/2006 (D.U.L.353/1 as amended); Regulation of the Committee (EU) no. 453/2010 from 20th May 2010 changing the regulation no. 2907/2006 of European Parliament and Council concerning registration, assessment, granting permissions and using limitations concerning chemicals (D. U. L 133/1 z 31.05.2010). Act from 27th April Environmental Protection Law (Dz.U.01.62.627 as amended); Act from 27th April 2001 about wastes (Dz. U.2010.185.1243 and Dz.U.2010.203.1351); Regulation of Minister of Environment from 27th September 2001 concerning waste (Dz.U.01.112.1206); Act form 11th May 2001 concerning packages and package waste (Dz.U.01.63.638 as amended); Regulation of Minister of Labour and Social Policy from 29th November 2002 concerning highest allowed concentrations of harmful substances in working environment (Dz.U.02.217.1833, as amended); Regulation of the Council of Ministers from 24th August 2004 concerning the register of forbidden works for non-adults and conditions of their employment for some of these works (Dz.U.04.200.2047 as amended.); Act from 28th October 2002 concerning road transport of dangerous goods (Dz.U.02.199.1671as amended.); Act from 31st March 2004 concerning railway transport of dangerous (Dz.U.04.97.962) Regulation of Minister of Economy from 21st December 2005 concerning requirements for individual protection measures (Dz.U.2005.259.2173); Regulation of Minister of Health from 20th April 2005 concerning examining and measurements of harmful factors in working environment (Dz.U.2005.73.645); Regulation of Minister of Environment from 20th August 2008 concerning the way of classification of condition of surface waters (Dz. U. 2008.162.1008). Regulation of Minister of Environment from 28th January 2009 changing the regulation concerning conditions for releasing waste to water and soil and concerning substances particularly harmful for water (Dz. U. 2009.27.169); Regulation form 25th February 2011 concerning chemical substances and their mixtures (Dz.U.2011.63.322).

#### **15.2. Chemical safety assessment**

Chemical Safety Report of the substance has been carried out. It is available at KGHM Polska Miedź S.A.

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**SECTION 16: Other information**

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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.

**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.

**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;

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

**LD<sub>50</sub>** – 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.

**LC<sub>50</sub>** – lethal concentration - concentration of a substance in the inhaled air, expressed in milligrams per litre, which causes death of 50% of the examined population after specified period of exposure.

**EC<sub>50</sub>** – effect concentration - substance concentration expressed in milligrams per litre causing the given pharmacological effect (e.g. inhibition of growth) at 50% of the examined population within specified time.

**NOEC** – no effect concentration – the highest concentration of the substance expressed in milligrams per litre, at which no toxic effects can be observed.

**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 Labour Code during the period of his occupational activity 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.

Necessary trainings: environmental instructions concerning safe using of substances, including its dangerous properties for human and harmful for environment

Sources of information used during preparation of the MSDS:

- Own results of qualitative and quantitative analyses of the substance;
- Hazardous Substances - Practical Guide, Ulrich Welzbacher, Publ. ALFA-WEKA; Warsaw, 1997r
- European Chemical Substance Information System (<http://ecb.jrc.ec.europa.eu/esis/>);
- Encyclopedia of technology, vol. Chemistry”, Publ. WNT, Warsaw, 1965r.

- „CHEMYSTRY structure & reactions“, Milton K. Synder, Science Technology Publ., Warsaw, 1975r.

All the data are based on our current knowledge. Recipients of our product must take into consideration existing legal regulations. This data sheet is a property of KGHM Polska Miedź S.A. "Legnica" Copper Smelter & Refinery and characterizes only our product.

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

Changes made according to Regulation (WE) from 20th May 2010 concerning:

- Identification of substance
- Classification and marking of substance
- First aid
- Fire and unintended release to environment proceedings
- Handling and storing
- Exposure control and individual protection measures
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Waste disposal
- Transport information
- Legal regulations

MSDS revised by: Process Safety Deputy Head Specialist, Hubert Opaczewski M.Sc. Eng.