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

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**1.1 Product identifier:****Name:** Sulfuric acid(VI)**Trade name:** Sulphuric acid(VI) 92% - 98.6%**IUPAC name:** Sulfuric acid**REACH registration No.:** 01-2119458838-20-0041**UN No.:** 1830**CAS No.:** 7664-93-9**WE No:** 231-639-5**Index number:** 016-020-00-8**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses: for production of: fertilizers, phosphoric acid, gaseous chlorine, paper, flocculant, bentonite, silica, lead concentrate, copper sulfate, zinc sulfate, wire rod and pipes, supply water preheaters, batteries and accumulators, lead glass, resins, hydrogen cyanide, nitrobenzene, for treating sewage and neutralization of waste (pH regulators), for regeneration and cleaning ion exchangers, for zinc ores enrichment, for electroplating process, aluminium anodizing, for electrolytic polishing.

Uses advised against: not known

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

KGHM Polska Miedź S.A.  
"Głogów" Copper Smelter & Refinery  
ul. Żukowicka 1  
67-200 Głogów

Person responsible for preparing the MSDS: Agnieszka Piechota, phone No.: (+48 76) 76) 747 71 76, e-mail: [a.piechota@kghm.pl](mailto:a.piechota@kghm.pl)

**1.4. Emergency telephone number**

Manufacturer (Poland): (48 76) 747 65 001 – available 24/7

Fire Department: 998 – available 24/7

General Emergency: 112 – available 24/7

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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

**P305+P351+P338+P315** - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

**P302+P361+P353+P315** - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice/attention.

**P301+P330+P331+P315** - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Get immediate medical advice/attention.

**P405** - Store locked up.

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

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

**2.3 Other hazards:**

Inhalation of vapours and aerosols leads to serious damage of respiratory ways. Ingestion leads to serious burning of oral cavity, gullet and stomach - may cause its perforation.

In case of release to aqueous environment, the substance causes reduction of its pH which can lead to death of fish, plants and invertebrates, due to corrosive properties hazardous for organisms and micro-organisms living in soil.

The substance does not meet the criteria for a PBT or vPvB substance.

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**SECTION 3. Composition/information on ingredients**

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**3.1. Substances**

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

No.	Substance name	CAS No.	Index No.	Percentage content [mass fraction]	Symbols	H statements
1.	Sulfuric acid (VI)	7440-50-8	016-020-00-8	92 - 98.6	Skin Corr. 1A	314
2.	Water	124-38-9	-	1.4-7	-	-

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

No.	Substance name	CAS No.	Index No.	Percentage content [mass fraction]	Symbols	R statements
1.	Sulfuric acid (VI)	7440-50-8	016-020-00-8	92 - 98.6	C	35
2.	Water	124-38-9	-	1.4-7	-	-

Full text of H and R phrases not expanded in section 2 can be found section 16.

**3.2. Mixtures**

n/a

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**SECTION 4. First Aid measures**

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**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.

**Immediate medical attention is required.**

Skin contact: Remove clothing, clean the skin with a lot of water, running water preferably. Do not use soap or any other neutralizing agents. 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:**

Routes of exposure: respiratory ways, alimentary way, skin, eyes.

- ingestion: pain (risk of perforation), nausea, vomiting, diarrhoea,
- skin contact: serious burns, causes necrosis of skin,
- inhalation: burning of mucosa;
- eyes contact: leads to cornea damage.

Acute intoxication symptoms:

Product in the form of mist and fumes causes pain, weeping, burns of conjunctiva, cornea, throat pains, cough, shallow breathing, accelerated breathing, breathlessness, glottis spasm, larynx edema, bronchi spasm, lungs edema. Death may occur as a result of glottis spasm. Skin contamination causes thermal (exothermic reaction with moist skin) and chemical burning. Eyes contamination causes burning of eyelids, eyeball and permanent damage. When ingested, causes burns of oral cavity, throat, gullet; may lead to perforation of gullet, stomach, bleeding of alimentary tract, shock.

Long-term exposure:

Long-term exposure to sulfuric acid may lead to chronic inflammation of conjunctivas, nose bleeding, chronic bronchi inflammation. Repeated exposure of skin may lead to ulceration, changes in nails.

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

If the victim is unconscious, make sure that the respiratory tract is not obstructed and place the victim in a recovery position. Provide medical attention.

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### **SECTION 5. Firefighting measures**

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#### **5.1 Extinguishing media:**

Suitable extinguishing media:

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

Additional information: Tanks within the range of fire should be cooled with sprayed water, do not let the water to penetrate to the tank, remove them from the area if possible.

## **SECTION 6: Accidental release measures**

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

#### 6.1.1 For non-emergency personnel:

Do not inhale mist/aerosol. In case of choosing evacuation route consider the direction of the vapour/aerosol movement.

#### 6.1.2 For emergency responders:

Personnel participating in rescue operation should wear protective, gas-tight clothes and apparatus isolating respiratory ways. Avoid direct contact with the substance. Remove flammable materials and other chemicals from the area. Do not let the substance get in contact with other chemicals or metals.

#### General instructions:

Notify those in the surroundings about the breakdown. Remove all personnel not taking part in the breakdown liquidation procedure from the area of hazard.

Call fire department and police department. Contain the acid leakage from the tank and its spreading, if possible.

### **6.2 Environmental precautions:**

Protect against direct penetration to the sewage system, ground and surface waters and soil. Protect against spreading by embanking the leakage area. Warn inhabitants if necessary

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

Acid collected in cavities and pits should be pumped to acid resistant tank, the remains should be neutralized with ground calcium carbonate, dolomite and collected to acid resistant tank for further utilization. The post-neutralization mass collected together with soil must be treated as hazardous waste. Neutralize the cleaned surface of soil with 10% suspension of hydrated lime. Flush the cleaned floor with a lot of water.

### **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:**

While diluting, always add acid to water, never the other way round. Do not let the formation of aerosols at the workplace. While handling, use tight devices made of acid resistant materials. Work only in well-ventilated rooms.

Wear tight, acid resistant clothing. While using, do not eat or drink, avoid contact with the substance and its solutions. While working with the substance, use eye protection. Workplace should be equipped with a shower and eyewash.

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

Storage tanks and fixtures should be made of the following materials: steel - only in contact with concentrated sulfuric acid (92-98.6%), acid resistant steel, Teflon, polyethylene (at temperature 20°C resistance within the whole range of concentrations), polypropylene (at temperature 20°C resistance within the whole range of concentrations). The tanks should be positioned on acid resistant emergency tray. Area of the warehouse should have acid resistant floor inclined towards sink basins, it should be equipped with internal waterworks installation and available sewage system connected to the acidic sewage treatment plant. Walls of the warehouse should be

anticorrosion protected. Do not store other chemicals in the warehouse. Warehouse should be ventilated. Water drawing points, emergency showers and eyewashes should be located near the work stations.

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

### **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 <sup>3</sup> ]	TLV-STEL [mg/m <sup>3</sup> ]
1.	Sulfuric acid (VI) - thoracic fraction <sup>(1)</sup>	0.05	-

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

No.	Substance name	TLV-TWA [mg/m <sup>3</sup> ]	TLV-STEL [mg/m <sup>3</sup> ]
1.	Sulfuric acid (mist) <sup>(2)(3)</sup>	0.05	-

<sup>(1)</sup> Thoracic fraction - aerosol fraction which penetrates into the airways within the chest, which poses a hazard to the health after deposit in the trachea - bronchial area and gas exchange area.

<sup>(2)</sup> When selecting an appropriate exposure monitoring method, account should be taken of potential limitations and interferences that may arise in the presence of other sulphur compounds.

<sup>(3)</sup> The mist is defined as the thoracic fraction.

#### Legal basis:

Regulation of the Minister of Labour and Social Policy of June 6th, 2014 on the highest allowable concentrations and intensities of agents harmful for health in the work environment (Official Journal 14.817);  
 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 98/24/EC as well as amending the Commission Directive 2000/39/EC (Official Journal 09.338);

#### Derived No Effect Levels (DNELs) of sulfuric acid:

- acute exposure, when inhaled, DNEL = 0.1 mg /m<sup>3</sup>
- chronic exposure, when inhaled, DNEL = 0.05 mg /m<sup>3</sup>

#### Note:

The recipient is obliged to control the work environment against concentration or intensity of harmful substances within frequency and range necessary to determine exposure rate of the employees according to national legislation in force.

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

#### Determination in air at the workplace:

PN-Z-04008-7:2002 – polish version - 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-EN 482:2009 – Air at the workplace - General requirements concerning measurement procedures.

## **8.2 Exposure controls:**

### 8.2.1 Appropriate engineering controls at industrial settings:

Tanks should be designed to ensure the minimization of loss of working medium, in the event of changes in temperature, humidity or pressure. At the inlet and outlet pipes of the excessive pressure/underpressure preventing devices valves should not be used. Elements of tanks in direct contact with the substance should be resistant to it. The design of the tank and its components should provide complete and secure emptying and cleaning, and proper venting even during a hydraulic leakage test. Filling the tank with liquid at the maximum working temperature should not exceed 97% of the tank capacity. The device for protection against excessive overpressure or underpressure should be designed to protect against leaking of substances from the tank and its penetration of foreign material (devices for protection against excessive overpressure and underpressure should be installed when the tank is not permanently connected to the atmosphere and in the tank may occur pressure increase over the maximum working pressure due to heating or chemical reaction, or an inadmissible pressure drop during filling or emptying the tank). Tanks should be equipped with devices to prevent overfilling.

Detailed requirements for storage tanks of corrosive substances are described in the Regulation of the Minister of Economy of April 16<sup>th</sup>, 2002 on technical supervision of technical conditions to be met by non-pressure and low pressure tanks used for storing poisonous or corrosive materials (Official Journal of 23 May 2002).

### 8.2.2 Individual protection measures, such as personal protective equipment

#### **Eye/face protection:**

Required: protective goggles with face protection.

#### **Hand protection:**

Required: protective gloves.

#### **Skin protection:**

Required: acid resistant clothing.

#### **Respiratory protection:**

Required when vapours/aerosols are formed - gas mask (absorber of acidic vapours).

#### **Thermal hazards:**

Not applicable.

#### **Hygiene measures:**

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

#### **Additional Information:**

Avoid inhalation of mists/aerosols. 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 of materials coated with viton, butyl rubber hypalon; protective gloves and shoes of PVC; goggles protecting against fluid drops; filter-absorber of B-P2 class with mask or half-mask; if concentration of the substance is

not known or in case of deficiency of oxygen in air, apply gastight clothing with breathing apparatus.

### 8.2.3. Environmental exposure controls:

Avoid release to the environment. Environmental exposure should be controlled in accordance with the national environmental protection legislation.

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

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

Appearance: at temp. 20°C colourless or slightly grey, opalescent, oily liquid;

Odour: perceptible, suffocating odour SO<sub>2</sub>;

Odour threshold: 1 mg/m<sup>3</sup>

pH: strong acid, pH = 0.3 for solution of 49 g H<sub>2</sub>SO<sub>4</sub>/1000 ml H<sub>2</sub>O at 25 °C;

Melting point: depending on the acid concentration:

98.5%: + 1.8 °C;

97.5%: - 3.7 °C;

96%: - 12.6 °C;

93%: - 27 °C;

Initial boiling point: depending on the acid concentration:

98, 48%: + 326 °C ± 5 °C;

100%: + 275°C ± 5°C (with decomposition);

Flash point: n/a

Evaporation rate: no data

Flammability: n/a

Explosive point: n/a

Vapour pressure: H<sub>2</sub>SO<sub>4</sub>:

at temp. 180 °C: 4.1 hPa for concentration of 95.06%

at temp. 326 °C: 449, 7 hPa for concentration of 98.48%;

Vapour density: in relation to air: 3.4;

Density at 20 °C: 1.83 g/cm<sup>3</sup> for acid of concentration 96% to 98%;

Relative density: n/a

Solubility:

– in water: unlimited with the release of significant quantity of heat;

– in organic solvents: soluble in ethanol with the release of significant quantity of heat.

Partition coefficient n-octanol/water: n/a

Self-Ignition point: n/a

Decomposition temperature: 338 °C

Viscosity: about 27 cP (20 °C)

Explosive properties: n/a

Oxidising properties: powerful oxidant.

### **9.2 Other information:**

Heat of solution of 1 mole of acid in 199 moles of water at temp. 25 °C is: - 74.33 kJ/mole.

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## **SECTION 10. Stability and reactivity**

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### **10.1. Reactivity:**



Sulfur oxides are released at high temperatures. Never pour water into concentrated sulfuric acid, failure to obey the principle may lead to explosive release of water steam with the substance in question. Strong acid reacts with most organic and inorganic compounds.

**10.2. Chemical stability:**

The substance is stable under normal conditions.

**10.3 Possibility of hazardous reactions:**

Oxidizing substance may ignite or explode if exposed to contact with flammable substances. Displaces weaker acids from their salts (e.g. hydrogen chloride from chlorides, hydrogen cyanide from cyanides). In contact with most metals hydrogen is released. Concentrated acid passivates iron and aluminium, reacts with semiprecious metals releasing SO<sub>2</sub>. Especially violent reactions leading even to an explosion with water and all bases and base-like substances and reductants.

**10.4 Conditions to avoid:**

High temperature, incompatible materials contact.

**10.5 Incompatible materials:**

Alkali metals and metals of alkali soils, their sulfides and carbides, alkali compounds, ammonia, phosphorus, phosphorus oxide, hydrides, permanganates, nitrates, nitrites, acetylides, nitriles, peroxides, water, picrates, organic solvents, nitro-compounds, oxy- halogen compounds, flammable substance, it is corroding for metals causing the release of hydrogen or sulfur oxides.

**10.6 Hazardous decomposition products:**

At high temperatures, it decomposes to toxic sulfur oxides (SO<sub>2</sub>, SO<sub>3</sub>).

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**SECTION 11. Toxicological information**

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**11.1 Information on toxicological effects:****a) Acute toxicity:**

on the basis of available data the criteria are not met

**Lethal and toxic concentrations and doses:**

LD<sub>50</sub> (orally, rat): 2140 mg/kg

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

LD<sub>50</sub> (rabbit, rat, skin): no data

**b) Skin corrosion/irritation:**

Sulfuric acid(VI) is listed in harmonized classification and labelling of hazardous substances (table 3.1. from appendix VI of CLP) and is classified as:

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

**c) Serious eye damage/ eye irritating:**

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

**d) Respiratory tract or skin sensitization:**

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

**e) Germ cell mutagenicity:**

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

**e) Carcinogenicity:**

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

**f) Reproductive toxicity:**

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

**g) Specific target organ toxicity — Single exposure:**



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

h) Specific target organ toxicity — Repeated exposure:

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

i) Aspiration hazard:

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

Other information:

Information on likely routes of exposure, on symptoms related to the product properties and the possible effects from exposure are described in section 4.2.

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## **SECTION 12. Ecological information**

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### **12.1. Toxicity:**

On the basis of available data the classification criteria regarding environment hazard are not met.

Toxic concentration of sulfuric acid for aqueous animal and plant organisms:

LC<sub>50</sub>/96 h fish: *Lepomis macrochirus* – 16 mg/l,

NOEC/65d fish: *Jordanella floridae* – 0.025 mg/l,

EC<sub>50</sub>/48h crustaceans: *Daphnia magna* – 100 mg/l,

NOEC crustaceans: *Tanytarsus dissimilis* – 0.15 mg/l,

NOEC/72h algae: *Desmodesmus subspicatus* – 100 mg/l,

### **12.2. Persistence and degradability:**

Persistent substance. Reacts with soil, forms sulfates or dissolves to SO<sub>2</sub>.

### **12.3. Bioaccumulative potential:**

Low bioaccumulative potential.

### **12.4. Mobility in soil:**

High mobility in soil. Mobility increases with dilution. Dissolves soil components, especially carbonates, reacts with organic substances and fertilizers present in soil. Soluble in water in any amount. Released to soil may reach underground water.

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

The substance is not classified as PBT or vPvB.

### **12.6. Other adverse effects:**

Not known.

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## **SECTION 13: Disposal considerations**

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### **13.1. Waste treatment methods**

Do not dispose of to the sewage system. Do not let the substance to contamination of surface and ground waters or soil. Do not dispose of at municipal landfills. Consider re-use. Recovery or disposal carried out in accordance with applicable regulations.

Recommended method of neutralization of waste: Physical and chemical transformation. Neutralization with calcium or sodium carbonates, water suspension of hydrated lime.

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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;

**14.4. Packing group:** RID/ADR: II;

**14.5. Environmental hazards:** the substance is not classified as environmental hazardous.

**14.6. Special precautions for user:** Avoid direct contact with the product. Personal protection equipment are described in section 8.8.2.

In case of leakage acid collected in cavities and pits should be pumped to acid resistant tank, the residue should be neutralized with ground calcium carbonate, dolomite and collected to acid resistant tank for further utilization. The post-neutralization mass collected together with soil must be treated as hazardous waste. Neutralize the cleaned surface of soil with 10% suspension of hydrated lime. Flush the cleaned floor with a lot of water.

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

**Additional information:**

**Trade name:** Sulphuric acid(VI) 92% - 98.6%

**Classification code:** RID/ADR: C1

**Limited quantities (LQ):** RID/ADR: 1 L

**Packing instruction:**

- ADR: P001; IBC 02

- RID: P001, DPPL02

**Hazard label:** RID/ADR: 8

**Hazard identification number:** RID/ADR: 80

**Special provisions:** RID: none; ADR: TP2

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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**

The substance is included on the list of precursors of the category 3 of the decree (EC) No. 273/2004 of the European Parliament and Council of February 11th, 2004, on narcotic precursors. Production, turnover and use of the sulfuric acid is subject to the regulations of the Minister of Economy and Labour of July 5th, 2002 on limitation, ban or conditions for production, turnover and use of hazardous substances and hazardous preparations as well as products containing such (Official Journal 04.168.1762, as amended).

Act dated February 25<sup>th</sup>, 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 18<sup>th</sup>, 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 Commission (EC) No. 453/2010 of May 20th, 2010, changing the Regulation (EC) No. 1907/ 2007 of the European Parliament and Council on Registration, Evaluation, Authorization and Restriction of Chemical substances (REACH) (Official Journal L 133 with subsequent amendments); 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 November 29<sup>th</sup>, 2002 on the highest allowable concentrations and intensities of substances harmful for health in the work environment (Official Journal No. 217, item 1833, with subsequent amendments); Act of August 19th, 2011 on transportation of hazardous goods (Official Journal 227.1367);

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); Regulation of the Board of Ministers of September 10th, 1996 on the list of works banned for women (Official Journal No. 114, item 545, with subsequent amendments).

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

Chemical safety assessment of the substance has been carried out. Chemical Safety Report is available at KGHM Polska Miedź S.A. "Głogów" Copper Smelter & Refinery.

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### **SECTION 16: Other information**

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Amendments have been made to sections: 3, 8, 11, 12, 14, 15, 16.

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.

**NDS/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.

**NDSch/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.

**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.

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

**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.

Sources of information used during preparation of the MSDS:

- Own results of qualitative and quantitative analyses of sulfuric acid(VI);
- Chemical Safety Report for sulfuric acid(VI) (2010);
- European Chemical Substance Information System (<http://ecb.jrc.ec.europa.eu/esis/>);
- TOXNET – Toxicology Data Network (<http://toxnet.nlm.nih.gov/>);
- ChemPortal - The Global Portal to Information on Chemical Substances

(<http://webnet3.oecd.org/eChemPortal/Home.aspx>);

- RTECS (Registry of Toxic Effects of Chemical Substances),
- Hazardous Substances - Practical Guide, Ulrich Welzbacher, Publ. ALFA-WEKA; Warsaw, 1997r
- „*CHEMYSTRY structure & reactions*”, Milton K. Synder, Science Technology Publ., Warsaw, 1975r.
- *Encyclopedia of technology, vol. Chemistry*”, Publ. WNT, Warsaw, 1965r.

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.