

KGHM POLSKA MIEDŹ S.A.

"GŁOGÓW" COPPER SMELTER DIVISION

MATERIAL SAFETY DATA SHEET

Sulfuric acid (VI) 92 %-98.6%

Date of issue: 15.10.1999

Revision No./Revision date: 7/14.01.2011

SECTION 1. Substance/mixture and manufacturer identification

1.1 Product identification:

Name: Sulfuric acid (VI)

Commercial name: Sulphuric acid (VI) 92 %-98.6 %

Name acc. to IUPAC: Sulfuric acid

No. of registration: 01-2119458838-20-0041

UN-No.: 1830

CAS No.: 7664-93-9

WE No.: 231-639-5

Index No.: 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 regulator), 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

ul. Żukowicka 1

67-200 Głogów

Person responsible for preparing the MSDS: Agnieszka Piechota, phone no.:

(+48 76) 747 7176, e-mail: a.piechota@kg hm.pl

1.4 Emergency telephone numbers:

Manufacturer: (+48 76) 747 65 01 – available 24/7.

Fire Dept.: 998 - available 24/7.



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General Emergency: 112 - available 24/7.

SECTION 2. Hazards identification

2.1. Classification of the substance:

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

Skin Corr. 1A; H314 — causes serious skin burns and eye damage.

Classification according to Directive 67/548/EEC:

C; 35 — causes serious burns

2.2. Marking:

GHS05



Warning phrase: **"DANGER"**

Warning phrases (H):

H314 — causes serious skin burns and eye damage.

Phrases specifying conditions of safe use (P):

P305+351+338+315 — in case of eye contact, carefully rinse with water for a few minutes, remove contact lenses if applicable and if they can be easily removed. Continue rinsing. Immediately seek medical attention.

P302+361+353+315 — in case of skin contact, remove contaminated clothing, rinse skin with water jet / shower. Immediately seek medical attention.

P301+330+-F331+315 — in case of ingestion, do not induce vomiting. Immediately seek medical attention.

P405 — keep closed.

P273 — avoid releasing to environment.

P501 — dispose of the content/container to the product manufacturer



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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 toxic properties hazardous for organisms and micro-organisms living in soil.



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SECTION 3. Composition/information on ingredients

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

No.	Name of substance	CAS No.	Index No.	Content [mass fraction in %]	Symbols	H phrases
1	Sulfuric acid (VI)	7664-93-9	016-020-00-8	92-98,6	Skin Corr. 1A	314
2	Water	124-38-9	-	1,4-7	-	-

b) according to Directive 67/548/EEC:

No.	Name of substance	CAS No.	Index No.	Content [mass fraction in %]	Symbols	R phrases
1	Sulfuric acid (VI)	7664-93-9	016-020-00-8	92-98,6	C	35
2	Water	124-38-9		1,4-7	-	-

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 oedema. Protect against loss of body heat. **Immediate medical help necessary.**

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 help necessary.

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 help necessary.

Alimentary way: Do not induce vomiting. Drink water and do not administer anything else orally. **Immediate medical help necessary.**

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



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Ways 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 oedema, bronchi spasm, lungs oedema. 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 assistance.

SECTION 5. Procedure in case of fire

5.1 Extinguishing agents:

Appropriate extinguishing agents: Non-flammable substance. Apply extinguishing agents proper for the surrounding materials. In case of acid leaks, use carbon dioxide and extinguishing powders.

Unsuitable extinguishing agents: 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



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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 Information for fire-fighters:

Personnel participating in extinguishing a fire should wear gastight protective clothing with breathing apparatus.

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. Procedure in case of accidental release to the environment

6.1 Personal precautions, protective equipment and emergency procedures:

6.1.1 For non-emergency personnel:

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

6.1.2 For emergency responders:

Personnel participating in the rescue action should wear gastight protective clothing with breathing apparatus. 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 Precautionary measures within the scope of environment protection:

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

6.3 Methods and materials protecting against spreading the contamination and for removing contamination:



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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.

SECTION 7. Handling the substance and its storage

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 in the work environment. While applying, use tight devices made of acid resistant materials. Work only in well-ventilated areas.

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 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



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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 uses:

The uses identified in item 1.2.

SECTION 8. Exposure control/personal protection equipment

Values of the highest admissible concentrations that should be controlled (Poland):

No.	Name of substance	CAS No.	NDS [mg/m3]	NDSch [mg/m3]
1.	Sulfuric acid (VI)	7664-93-9	1	3

Values of the highest admissible concentrations that should be controlled (European Union):

No.	Name of substance	CAS No.	TLV - TWA [mg/m3]	TLV - STEL [mg/m3]
1.	Sulfuric acid (vapours) ⁽¹⁾⁽²⁾	7664-93-9	0,05	-

(1) When selecting appropriate method of monitoring the exposure, consider potential limitations and disturbances which could be created in the presence of other sulfur compounds.

(2) Vapours are defined as trachea fraction.

Legal basis:

Decree of the Minister of Labour and Social Policy of November 29th, 2002 on the highest allowable concentrations and intensities of agents harmful for health in the work environment (Official Journal 02.217.1833, as amended);

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 L 338 of 19.12.2009);

Decree of the Minister of Health of December 30th, 2004, on Safety at Work related to handling chemicals in work environment (Official Journal 05.11.86, as amended);

Decree of the Board of Ministers of August 24th, 2004, on the list of works banned for



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adolescents and conditions of their employing to some works. (Official Journal 04.200.2047, as amended);

It is forbidden for adolescents to perform works exposing to caustic substances.

Determination in air within the workplace:

PN-Z-04008-7:2002 Air purity protection – Taking air samples – Principles of air sampling at workplace and results interpretation;

PN-EN 689:2002 Workplace atmospheres – Guidelines on evaluation of inhalation exposure to chemicals by comparing with admissible values and measurement strategy;

PN-EN 482:2002 Workplace atmospheres – General requirements concerning measurement procedures;

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

PN-79-Z-04056 sheet 03 Air purity protection. Examination of sulfuric acid content.

Determination of sulfuric acid at workplace by titration.

PN-91-Z-04056 sheet 02 Air purity protection. Examination of sulfuric acid and sulfur trioxide content at workplace by turbidimetric analysis.

8.2 Exposure control:

8.2.1 Appropriate engineering controls:

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



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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 caustic substances are described in the Decree on of the Minister of Economy of 16 April 2002 on technical supervision of technical conditions to be met by non-pressure and low pressure tanks used for storing poisonous or caustic (Official Journal of 23 May 2002).

8.2.2 Personal protection measures same as personal protection equipment:

Eye and face protection:

necessary: protective goggles with face protection,

Hands protection:

necessary: protective gloves,

Skin protection:

necessary: acid resistant clothing,

Respiratory ways protection:

necessary when vapours/aerosols are formed – gas mask (absorber of acidic vapours),

Thermal hazards:

Not applicable

Hygiene means:

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 vapours/aerosols. When concentration of the substance is established and known, selection of personal protection equipment must consider concentration present in the work environment, exposure time and operations performed by an employee 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



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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 semi-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 releasing to the environment. Environmental exposure should be controlled in compliance with national environment protection legislation in force.

SECTION 9. Physical and chemical properties

9.1 Basic physical and chemical properties information:

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

Odour: perceptible, suffocating odour SO₂;

Level of odour perception: 1 mg/m³

pH: strong acid, pH = 0.3 for solution of 49 g H₂SO₄/1000 ml H₂O 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 and boiling temperature range: depending on the acid concentration:

98, 48 % 326°C ± 5°C;

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

Ignition temperature: n.a.

Evaporation rate: no data available

Flammability

Explosion limits: n.a.

Vapour pressure H₂SO₄:

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

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



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Density of vapours in relation to air: 3.4;

Density at 20°C: 1.83 g/cm³ for acid of concentration 96% to 98%;

Bulk 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 temperature: n.a.

Decomposition temperature: ca 338°C

Explosive properties: n.a.

Oxidizing properties: highly oxidizing;

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.

SECTION 10. Stability and reactivity

10.1 Reactivity

Sulfur oxides are released at high temperatures. Never pour water into concentrated sulfuric acid, failure to observe 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 SO₂. Especially violent reactions leading even to an explosion with water and all bases and base-like substances and reductants.



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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_2 , SO_3)

SECTION 11. Toxicological information

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:

LD₅₀ (orally for rat): 2140 mg/kg

LC₅₀ (rat, inhalation): 510 mg/m³ (2h)

LC₅₀ (mouse, inhalation): 320 mg/m³ (2h)

TCL₀ (human, inhalation): 3 mg/m³ (24 weeks)

LDL₀ (human, orally): 135 mg/kg

TCL₀ (rat, inhalation): 20 mg/m³ (7 h)

LD₅₀ (rabbit, rat, skin): no data

b) skin corrosion/irritation:

due to pH (ca.1) of the product it is classified as : Skin Corr. ;H314 The substance causes serious skin burns and eye damage.

c) serious eye damage/ eye irritating:

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



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d) respiratory tract or skin sensitisation

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

e) reproductive mutagenicity

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

f) carcinogenicity

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

g) harmful for reproduction

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

h) toxicity to specific organs – single exposure

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

i) toxicity to specific organs – repeated exposure

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

j) aspiration hazard

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

Other information:

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

SECTION 12. Ecological information

12.1 Toxicity:

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

Toxic concentration for aqueous animal and plant organisms:

LC₅₀/96 h fish: Brachydanio rerio — 500 mg/l,

LC₀/96 h fish: Carassius auratus — 134 mg/l,

LC₅₀/24h fish: Brachydanio rerio — 82 mg/l,

LC₅₀/48 h fish: Plafichthys flesus — 100-330 mg/l,

LOEC fish: cyprinus carpio — 22 mg/l,



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EC₅₀ crustaceans: Crangon crangon — 70-80 mg/l, Daphnia magna — 30 mg/l,

LOEC protozoon: Paramecium caudatum — 200 mg/l,

EC₀ water bacteria: Pseudomonas fluorescens — 6900 mg/l (24 h),.

Other data:

Lethal concentration for fish: H₂SO₄: 6.3 mg/l (24h), long-term exposure: 1.2 mg/l.

12.2 Persistence and degradability:

Persistent substance. Reacts with soil, forms sulfates or dissolves to SO₂.

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.

Product not classifies as PBT and vPvB.

12.6 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 contaminate surface and underground water and soil. Do not store at municipal dump yards. Consider the opportunity to reuse. Recovery or neutralization must be performed according to the regulations in force.

Recommended method of neutralization of waste: Physical and chemical transformation.

Neutralization with calcium or sodium carbonates, water suspension of hydrated lime.

Procedure with emptied packages: Disposable packages must be handed over to an authorized collector of package waste.

Waste management according to the Decree of April 11th, 2001 on waste and packaging (Official Journal 2001 No. 63 item 638, as amended).



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SECTION 14. Information concerning transportation

Commercial name of the material: **SULFURIC ACID (VI) 92 %-98.6%**

Identification number of the material: **UN1830**

Transportation name RID and ADR: **CAUSTIC MATERIAL, NO OTHER HAZARD, ACIDIC, INORGANIC, LIQUEFIED**

Name and description of the Goods: **SULFURIC ACID, containing more than 51% of acid**

Class: **8**

Classification code: **C1**

Packing group: **II**

Packing instructions: **P001, DPPL 02**

Hazard identification number: **80**

Special precautions for users:

Avoid direct contact with the product. Personal protection measures as described in section 8.8.2.

In case of leakage 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.

SECTION 15. Information regarding legal regulations

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).



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- The substance is not covered by the regulations of the Decree (EC) No. 2037/2000 of the European Parliament and Council of 29th June, 2000 on substances depleting ozone layer (Official Journal L 244 of 29.09.2000, as amended) or the Decree (EC) No. 850/2004 of the European Parliament and Council of April 29th, 2004, on permanent organic contamination and changing the Directive 79/117/EEC (Official Journal L 158 of 30.4.2004, as amended). The substance is not subject to regulations of the Decree of the European Parliament and Council (EC) No. 689/2008 of June 17th, 2008 on export and import of hazardous chemicals (Official Journal L 204 of 31.07.2008, as amended).

The substance is not listed in the annex I to the Directive of the Council 96/82/EC of December 9th, 1996, on control of significant breakdowns hazard related to hazardous substances (Official Journal L 192, 08/07/1998, as amended).

The substance is not listed in the annex X to the Decision No. 2455/2001/EC of the European Parliament and Council of November 20th, 2001, establishing the list of priority substances within the scope of water policy, changing the Directive 2000/60/EC (Official Journal L 331, 15/12/2001).

Provisions of law:

Decree (EC) No 1907/ 2006 of the European Parliament and Council of December 18th, 2006 on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH), creating European Chemicals Agency, changing the Directive 1999/ 45/ EC as well as revoking the Council (EC) Decree No. 793/ 93 as well as the Commission Directive (EC) No. 1488/94 as well as the Council Directive 76/769/EEC and Council Directive 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. 20. Decree of the European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008 on classification, marking and packing hazardous substances and mixtures, changing and revoking the Directive 67/548/EEC and 1999/45/EEC as well as changing the Decree (EC) No. 1907/2006. Directive of the Council 67/548/EEC of June 27th, 1967, on approaching the statutory, executive and administrative regulations related to classification, packing and labelling hazardous substances (as amended); Directive 1999/45/EC of the European Parliament and Council of May 31st, 1999



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on approaching the statutory, executive and administrative regulations of the Member States related to classification, packing and labelling hazardous substances, as amended; Act of April 27th, 2001, Environment Protection Law (Official Journal 01.62.627, as amended); Act of January 11th, 2001 on chemical substances and preparations (Official Journal 01.11.84, as amended); Decree of the Minister of Labour and Social Policy of November 29th, 2002, on the highest admissible concentrations and intensities of substances harmful for health in the work environment (Official Journal 02.217.1833, as amended); Act of October 28th, 2002, on road transportation of hazardous goods (Official Journal 02.199.1671, as amended); Act of March 31st, 2004, on railway transportation of hazardous goods (Official Journal 04.97.962); Act of April 27th, 2001 on waste (Official Journal 01.62.628, as amended); Decree of the Minister of Environment of September 27th, 2001 on catalogue of waste (Official Journal 01.112.1206); Act of May 11th, 2001 on packages and package waste (Official Journal 01.63.638, as amended); Decree of the Commission (EU) No. 453/2010 of May 20th, 2010 changing the decree (EC) No. 1907/2006 of the European Parliament and Council on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH) (Official Journal L 133, as amended); Decree of the Board of Minister of August 24th, 2004, on list of works banned to adolescents and conditions of their employment for some works. (Official Journal 04.200.2047, as amended); Decree of the Board of Ministers of September 10th, 1996 on the list of works banned for women (Official Journal No. 114, item 545, as amended).

15.2 Chemical safety assessment:

Chemical safety assessment of sulfuric acid (VI) has been carried out. Chemical safety report is available at KGHM Polska Miedź S.A. Oddział Huta Miedzi "Głogów".

SECTION 16. Other information

The material safety data sheet has been updated according to Decree of the Commission (EU) No. 453/2010 of May 20th, 2010 changing the decree (EC) No. 1907/2006 of the European Parliament and Council on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH) (Official Journal L 133, as amended) and the Decree of the



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European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008, on classification, marking and packing hazardous substances and mixtures, changing and revoking the Directive 67/548/EEC and 1999/45/EEC as well as changing the Decree (EC) No 1907/2006.(as amended).

Explanations of abbreviations and acronyms used in the MSDS:

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

Index number – it is an identification code given in part 3 of the annex VI to the Decree of the European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008, on classification, marking and packing hazardous substances and mixtures, changing and revoking the Directive 67/548/EEC and 1999/45/EEC as well as changing the Decree (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/semiproduct registration by the manufacturer/importer according to REACH Decree.

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

Name according to IUPAC – 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 or intensity of other hazardous agent, whose action on an employee during 8-hour daily shift and average weekly time of work, 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 – weighed average of concentration of the specified, toxic chemical compound which



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should not cause negative changes of an employee 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.

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

LDL₀ – the lowest (recorded in the literature) dose of substance introduced to an organism by any means (except inhalation), which is capable of killing the examined population within specified time

LC₅₀ – 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.

LEOC – the lowest concentration of the substance expressed in milligrams per litre, at which the first toxic effects can be observed (Lowest Observed Effect Concentration) within specified time.

EC₅₀ – substance dose expressed in milligrams per litre causing the given pharmacological effect (e.g. inhibition of growth) at 50% of the examined population within specified time.

TCL₀ – the lowest (recorded in the literature) toxic concentration of substance introduced to an organism through inhalation which causes toxic effect of any kind at the examined population after specified period of exposure.

LC₀/EC₀ – the lowest possible concentration of substance which does not cause death of the examined population within specified time.

Sources of information used during preparation of the MSDS:

- Results of own qualitative and quantitative analyses of sulfuric acid (VI);
- Chemical Safety Report for sulfuric acid(VI); 2010;
- European Chemical Substance Information System (<http://ecb.irc.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),



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- Hazardous Substances – Practical Guide, Ulrich Welzbacher, Wyd. ALFA-WEKA; Warszawa, 1997r.;
- CHEMISTRY – structure and reactions. Milton K. Snyder, Wydawnictwa Naukowo-Techniczne, Warszawa, 1975r.
- Encyclopaedia of Engineering – CHEMISTRY. Wyd. WNT, Warszawa, 1965r.

Necessary training: Post-related training within the scope of safe use of a substance considering its hazardous properties for humans and 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: telephone numbers given in item 1.

Approved by:



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