

**SAFETY DATA SHEET**

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Date issued: 12. 4. 2000

Product name: **SULPHURIC(VI) ACID - CONCENTRATED**

Date revised: 12. 10. 2007

Revised version No.: 3

**1. Chemical product and supplier identification:**

1.1.	<b>Product identification:</b>	SULPHURIC(VI) ACID CONCENTRATED	Identification No.: P029165
1.2.	<b>Product use:</b>	inorganic, organic, food-processing, pharmaceutical, metal industry...	
1.3.	<b>Supplier identification ( manufacturer, importer, distributor):</b>		
1.3.1.	<b>Supplier name:</b>	CINKARNA CELJE, Inc.	PE: Titanium Dioxide
1.3.2.	<b>Supplier address:</b>	Kidričeva 26, 3001 CELJE – SLOVENIJA, 386 3 427 60 00	
1.3.3.	<b>Contact person:</b>	E-mail: janez.planinsek@cinkarna.si	
1.3.4.	<b>Emergency number:</b>	386 3 427 61 12 (Cinkarna Celje)	

**2. Hazard identification:**

2.1.	<b>Hazards:</b>	Corrosive.
2.2.	<b>Specific hazards:</b>	Non-volatile oily liquid, colourless, odourless, extremely hygroscopic, organic substances carbonate, causes burns, strong exothermic reaction with water contact with oxidants may provoke ignition or explosion.
2.3.	<b>Symptoms after exposure:</b>  - Inhalation:  - Skin contact:  - Contact with eyes:  - Ingestion:	Damage to respiratory organs, skin, eyes, digestive organs, burns, mental and physical disorders, unconsciousness. Aerosols or vapours strongly irritate respiratory organs, skin and eye mucosa.  Inhalation of vapours results in injuries of mouth cavity and respiratory organs;  Contact with skin induces lesions, deep abrasions with slow recovery and tendency of ulceration;  Contact with eyes causes laceration, may cause blindness.  Ingestion result in severe injuries of tongue, gullet, and stomach.
2.4.	<b>Danger to environment:</b>	/

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### 3. Composition with information on hazardous ingredients:

3.1.	<b>Common name: SULPHURIC ACID</b>	concentrated					
3.2.	<b>Hazardous ingredients:</b>						
Chemical name	Registration number	Index No.	CAS No.	EC No.	ut./vol/ %/ max concentration	Hazard symbol	Risk R
Sulphuric(VI) acid		016-020-00-8	7664-93-9	231-639-5	over 93 %	C	R 35

### 4. First aid measures:

4.1.	<b>General instructions:</b>	Remove contaminated clothing and footwear at once.
4.2.	<b>Inhalation:</b>	Take the victim to fresh air at once and place them in a comfortable position and seek medical assistance.
4.3.	<b>Contact with skin:</b>	Wash the skin with large quantities of cold water and seek medical assistance regardless of the symptoms.
4.4.	<b>Contact with eyes:</b>	Rinse thoroughly with large quantities of cold running water (10 – 15 minutes) with open eyelid, moving the eye in all directions and seek medical assistance at once.
4.5.	<b>Ingestion:</b>	At ingestion, immediately rinse mouth thoroughly and after that drink plenty of water. Do not induce vomit, seek medical assistance at once.
4.6.	<b>First aid at work:</b>	If sulphuric acid has been ingested, do not use NaHCO <sub>3</sub> or CaCO <sub>3</sub> for neutralization, because the formed CO <sub>2</sub> can cause gastroesophageal perforation. The victim should drink milk slowly, or MgO suspended in water. A specific antidote is not known; treat symptomatically. Vapours cause severe trachea damage. Codeine can be used against cough. When respiratory tract is irritated, use 5 inhalations from aerosol with dexamethasone (Tuxilolon, Thomac) every 15 minutes. Antibiotic prophylaxis is necessary in case of respiratory tract damage.

### 5. Fire prevention measures:

5.1.	<b>Suitable extinguishing medium:</b>	Sulphuric acid is nonflammable and does not burn easily. If involved in fire, use foam and carbon dioxide (CO <sub>2</sub> ), or powder.
5.2.	<b>Special hazards:</b>	Do not spray water into open containers ( <b>severe exothermic reaction occurs with water – explosion hazard</b> ). Contact with metal dust can cause ignition. Acid vapours are also non-flammable. In contact with metals, when the concentration is lower than 77 %, generated hydrogen can form an explosive mixture with air, particularly if the acid is stored or transported in containers which are not full or tightly closed. When opening such containers, make sure there are no sources of fire nearby. When emptying and repairing such containers, pipelines and devices, assure good ventilation and prevent sparking. Decomposition of sulphuric acid generates water vapour and SO <sub>3</sub> , which together form a suffocating (stifling) fog that strongly irritates respiratory tract, as well as vapours which are not very toxic. Concentrations ranging from 1.5 to 2.5 ppm can cause great discomfort while concentrations ranging from 10 and 20 ppm are already intolerable. Acid vapours are heavier than the air. In case of fire, the containers can be cooled with sprinkling water, but only if they are tightly closed. Suitable extinguishing medium is powder.

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5.3.	<b>Special protective fire fighting equipment, indicated by standard if any:</b>	<p>For short-term respiratory tract protection (30 mins maximum) with utmost 2 % volume of acid in the atmosphere and 16 % volume of oxygen, we can use a gas mask with chemical filter for acid vapour absorption. At higher concentrations, protect respiratory tract with a tubular mask, or self-contained apparatus providing independent air and oxygen flow.</p> <ul style="list-style-type: none"> <li>- protective gloves</li> <li>- protective goggles, face shield</li> <li>- protective clothing and apron, impermeable shoes or boots</li> <li>- All these have to be made from acidproof material.</li> </ul>
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## 6. Accidental discharge:

6.1.	<b>Personal safety measures:</b>	Seal the affected area and deny access to unauthorized persons. Wear acidproof clothing, footwear, face shield and goggles in the affected zone. Call the police and fire brigade. Prevent contact with metals and flammable substances.
6.2.	<b>Environment protection:</b>	Discharges into water are prevented by heaping (diking) earth.
6.3.	<b>Cleaning after accidental discharge:</b>	Neutralize spilt acid with lime or slaked lime. In small quantities the acid has to be neutralized to pH = 6 – 9, and in large quantities, the formed gypsum (calcium sulphate) has to be collected and deposited in a waste disposal landfill.

## 7. Handling and storage:

7.1.	<b>Handling:</b>	Keep reservoirs and containers with sulphuric acid in a special, cool, dry and ventilated place and out of direct sunlight.
7.1.1.	<b>Safety measures:</b>	Personnel involved in work with sulphuric acid has to be acquainted with the dangers at work, proper handling, equipment for personal protection and precautions in case of accidents (first aid and environment protection). Safety showers and eyewash fountains have to be in the immediate neighbourhood of the storage area.
7.1.2.	<b>Technical measures:</b>	Sulphuric acid is non-flammable and does not burn easily, but it can cause ignition of many flammable materials such as wood, paper, cotton, etc. It can ignite in contact with metal dust. Sulphuric acid vapours are also non-flammable. In contact with metals, especially if the concentration is lower than 77 %, the generated hydrogen can form an explosive mixture with air particularly if the acid is stored or transported in containers which are not full or tightly closed. When opening such containers, make sure that there are no sources of fire nearby. When emptying and repairing such containers, pipelines and devices, assure good ventilation and prevent sparking.
7.1.3.	<b>Recommended and forbidden measures:</b>	<b>CAUTION: When diluting, always pour acid in water.</b>
7.2.	<b>Storage:</b>	The storage area ground has to be made from acidproof material. This area has to have a disposal sewer, leading to a collecting well (pit), where the spilt acid can be neutralized. Larger containers have to stand on acidproof base so as to allow washing the floor with water.
7.2.1.	<b>Conditions for safe storage:</b>	Smoking is not permitted in the storage area. Containers with sulphuric acid have to be closed tightly and clearly labelled. During the hot season, the containers have to be ventilated periodically.

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		CAUTION: Such receptacles may contain explosive gas <b>hydrogen</b> . The storage temperature should not be below (5°C)-danger of freezing (sulphuric (VI) acid crystallizes by + 7°C).
7.2.2.	<b>Separating incompatible products:</b>	It is forbidden to store chlorates, chromates, nitrates and similar, including combustible materials, HCl, HNO <sub>3</sub> , leach, metal dust, etc. in the storage area.
7.2.3.	<b>Special packaging</b>	According to ADR classification, H <sub>2</sub> SO <sub>4</sub> is classified as: Class 8: Corrosive substances A. Acid substances Border No. 2.2.8.1.2: C1 – C10 corrosive substances with no extra hazards C1 – C4 acids: C1 inorganic, liquid: UN No. 1830 sulphuric acid with more than 51 % of acid Corrosive substances classified C1 can be packed in group II packaging – border No. 2.1.1.3. and chapter 4.1. border No. 4.1.4.1. packaging P001 and IBC02. For further details see ADR, upper border numbers section.
7.2.4.	<b>Protection against static electricity:</b>	/
7.3.	<b>Specific use:</b>	Varies from customer to customer.

## 8. Exposure control/safety at work:

8.1.	<b>Maximum exposure values:</b>	Sulphuric acid aerosol – concentration in air MV at workplace: 0,1 mg/m <sup>3</sup>
8.2.	<b>Exposure control:</b>	
8.2.1.	<b>Health and safety measures at the workplace:</b>	See chapters 3., 5., 6., 7., 10., - have to be constantly taken into account and monitored.
	Personal protection:	All personal protective equipment has to be clean and in perfect condition at all times. Never use damaged equipment. Give it regular thorough checks.
	Respiratory system protection:	None required under normal conditions. In case of fire see chapter 5.3.
	Skin and body protection:	Acidproof clothing, hat and boots.
	Hand protection:	Acidproof gloves.
	Eye protection:	Safety goggles, tightly fitting the face. Face shield.
	General work hygiene:	Remove soiled and contaminated clothing at once. Wash hands before the break and after work. Take a shower after work. Do not store sulphuric acid near food and drink.
8.2.2.	<b>Environment exposure control:</b>	See chapters 5., 6., 7., 10., 11., 12., and 13. – have to be constantly taken into account and monitored.

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**9. Physical and chemical properties:**

9.1.	<b>General information:</b>  - appearance  - odour	Colourless oily liquid  Odourless
9.2.	<b>Important health, safety and ecological information:</b>  - pH:  - Boiling point:  - Melting point:  - Flash point:  - Ignition point ( for solids and gases):  -Explosive properties (upper/lower border):  - Oxidation properties:  - Vapour pressure:  - Relative density:  - Solubility ( in water and fats):  - Distribution coefficient  - Other data:	< 1 ( 20°C, at concentration g/l )  ~ 310°C, ( 338°C – 98.3% )  - 10°C, (10.36°C – 100% )  non-flammable  non-flammable  none reported  none reported  10 <sup>-4</sup> mbar ( 20°C )  1.84 g/cm <sup>3</sup> ( 20°C )  unlimited ( in water)  /  Decomposition into SO <sub>3</sub> and H <sub>2</sub> O at 450°C

**10. Stability and reactivity:**

10.1.	<b>Stability and reactivity:</b>	Stable under normal application and transport conditions.
10.1.1.	<b>Conditions to avoid:</b>	Hazardous reaction when improperly mixed with water, alkalis and other acids. Contact with metals may generate hydrogen – see 7.1.2.
10.1.2.	<b>Incompatibility with other substances:</b>	Oxidizing agents, water, alkalis, organic compounds – see 7.2.2.
10.2.	<b>Hazardous products of decomposition:</b>	SO <sub>3</sub> , SO <sub>2</sub> and H <sub>2</sub> O ( water vapour – aerosol ).
10.3.	Other data:	Hygroscopic, corrosive, organic materials carbonize.

**11. Toxicological information:**

11.1.	<b>Acute toxicity:</b>	Derives from its corrosive property.
11.2.	<b>Chronic toxicity or effects of overexposure:</b>	Ingestion causes severe damage to tongue, throat and stomach. Causes severe burns and skin damage (sores) which do not heal well. Inhaling vapours causes

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		severe damage to mouth and respiratory tract: LC50 / 510 ppm / 2h. Causes severe damage to mucous membrane – sores, ulcers, which are hard to heal.
11.3.	<b>Oversensibility:</b>	/
11.4.	<b>Specific effects:</b>	According to the results of some research into »strong inorganic acid mist effect« including sulphuric acid, risk of cancer on human respiratory tract exists according to IARC.

## 12. Ecotoxicological information:

12.1.	<b>Ecotoxicology:</b>	Toxic for fish according to LC50 (96h): 134 mg/l. Toxic for daphnias according to EC50 (24h): 29 mg/l.
12.2.	<b>Mobility:</b>	Liquid, complete solubility in water, limitless possibilities of mixing with water.
12.3.	<b>Stability and decomposition:</b>	Sulphuric acid can be removed from water only through neutralization and not through biological treatment.
12.4.	<b>Accumulation:</b>	/
12.5.	<b>Other environmentally-unfriendly effects:</b>	/

## 13. Disposal:

13.1.	<b>Product:</b>	Sulphuric acid is not allowed to be disposed of just anywhere but in a suitable waste disposal landfill. In small quantities, the acid has to be neutralized to pH = 6.2 – 9.1, and in large quantities the acid has to be neutralized with lime and gypsum has to be deposited in a suitable waste disposal landfill, complying with the valid regulations on waste disposal.
13.2.	<b>Contaminated packaging:</b>	Empty packaging has to be neutralized with lime milk and washed with clean water, complying with the valid regulations.

## 14. Transport information:

14.1.	<b>ADR, RID:</b>	ADR
14.2.	<b>UN number:</b>	1830
14.3.	<b>Name:</b>	SULPHURIC ACID
14.4.	<b>Class:</b>	8
14.5.	<b>Classification code:</b>	C1
14.6.	<b>Packaging group:</b>	II
14.7.	<b>Hazard label:</b>	8

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<b>15. Regulations governing the use of chemicals:</b>		
15.1.	<b>EC classification, letter, hazard labels, S and R (with the text), special regulations:</b>	
15.1.1.	<b>Classification:</b>	231 – 639 – 5
15.1.2.	<b>Labelling:</b>	C – corrosive
15.1.3.	<b>Caution:</b>	R35 – causes severe burns.
15.1.4.	<b>Safety instructions:</b>	S1/2 – keep out of the reach of children S26 – In case of contact with eyes, rinse with plenty of water at once and seek medical assistance. S30 – Never add water. S45 – In case of accident, or when feeling unwell, seek medical assistance at once. Show the label if possible.
15.1.5.	<b>Special provisions:</b>	/
15.2.	<b>Regulations /Standards:</b>	Regulations governing the use of chemicals. Regulations on classification, labelling and packaging of dangerous goods.
<b>16. Other information:</b>		
16.1.	<b>Staff training:</b>	Safety at work test. Test in handling dangerous goods.
16.2.	<b>Recommended or restricted use of product:</b>	Not given.
16.3.	<b>Instructions:</b>	The information listed above in the sections of the safety data sheet is believed to be accurate and correct and is based on currently available information that has been collected through the process of work with chemicals, as well as the instructions for safe use, transport, storage, safety measures, first aid and personal protection. Other technical information on tel.: 03-427-6630 It is the user's responsibility to follow our instructions for use, to get acquainted with the valid state (national) legislation and regulations, and to act accordingly.
16.4.	<b>Sources:</b>	Original Safety Data Sheet from raw material manufacturers, Official Journal No.: 110/03, 47/04, 35/05, 54/07, 32/06, 84/06, 106/06, 53/07, 9/05, 9/07 Directive (ES) n.: 1907/06 Council Directive n.: 67/548/EGS
16.5.	<b>Revised issue:</b>	Amendments of the Directive (ES) n.: 1907/06.