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SAFETY DATA SHEET	Page 1 of 6
	Issued on:April the 4 th , 2008
Trade name: TITANYL SULFATE -SOLUTION	Revised on November the 8 th, 2021
	Version: 11

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

1.1.	**Product identifier (Product registration number, nanoform, UFI):**	**Titanyl sulfate - solution**	
1.2.	**Relevant identified uses of the substance/mixture and uses advised against:**	Manufacture of substances (PROC1 – ERC1)	
	identified uses	**process categories - PROC**	**categories release into the environment-ERC**
	coating industry	PROC1	
	synthesis of ultrafine titanium dioxide		ERC1
	etchant	PROC1	
	leather industry	PROC1	
1.3.	**Details of the supplier of the safety data sheet (manufacturer, importer, only representative, downstream user or distributor):**		
1.3.1.	Supplier name:	CINKARNA CELJE, d.d.	
1.3.2.	Supplier address and phone:	Kidričeva 26, 3001 CELJE, SLOVENIJA, +386 3 427 60 00	
1.3.3.	E-Mail (competent person):	**tatjana.rozman@cinkarna.si**	
1.4.	**Emergency phone number:**	In case of health risk, consult your doctor. Additional information are available: During working hours from 7 a.m. to 3 p.m. +386 3 427 65 78 +386 3 427 60 00	

2. Hazards identification

2.1.	**Classification of substance or mixture:**	**Regulation (EC) No 1272/2008** Met. Corr. 1 Skin Corr. 1A Eye Dam. 1 H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage. H318 Causes serious eye damage.
2.2.	**Label elements:**	**Labelling according to Regulation 1272/2008**  Danger H290 May be corrosive to metals.

		H314 Causes severe skin burns and eye damage. P264 Wash with water thoroughly after handling P280: Wear protective gloves/protective clothing/eye protection/face/protection. P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing P310 Immediately call a POISON CENTER or doctor/physician. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rising. P405: Sore lock up. P406: Store in corrosive resistant/container with a resistant inner liner P501: Dispose of contents/container - neutralized and disposed of in accordance with national laws
2.3.	**Other hazards:**	none

3. Composition/information on ingredients

3.1. /3.2	**Substances/ mixture:** Mixture contains up to 39 % H_2SO_4, up to 12 % TiO_2 (or up to 24 % $TiOSO_4$) and water

Chemical name	CAS No. EC No. Index No.	REACH Registration No. Reference No.	% wt/vol/max. conc.	Classification according to Regulation (EC) No 1272/2008 (CLP)	SCL, M-factor, ATE
Sulphuric acid H2SO4	7664-93-9 231-639-5 016-020-00-8	01-2119458838-20-0082	32 % – 39 %	Skin corr.1A H314	Skin corr.1A; H314; C>=15% skin irrit. "; H315:5%<=C<=15 % eye irrit. 2; H319:5%<=C<=15 %
Titanium oxide sulphate	13825-74-6 237-523-0	01-2119560603-42-0003	10 % - 12 % expressed asTiO2	Met. Corr. 1 Skin Corr. 1A Eye Dam. 1 H290 H314 H318	Not hazardous substance

4. First aid measures

4.1.	**Description of first aid measures:**	Remove contaminated clothing and footwear.
	Inhalation:	Carry the injured outdoors, breathe plenty of fresh air, put in comfortable position and seek medical assistance.
	Skin contact:	Wash the affected area with plenty of water and seek medical assistance.
	Eyes/mycosis contact:	Rinse with cold water for at least 10 to 15 minutes) with opened eyelids and moving the eyeballs in all directions, seek medical assistance.
	Ingestion:	Rinse mouth with water and drink lots of water, do not incite vomiting,

		seek medical assistance.
4.2	**Most important symptoms and effects, acute and delayed:**	Spasm, inflammation and edema of the larynx, spasm, inflammation and edema of bronchi, pneumonitis, pulmonary edema, burning sensation, cough, wheezing, laryngitis, shortness of breath, headache.
4.3.	**Indication of any immediate medical attention and special treatment needed:**	Rinse mouth with water and drink lots of water, seek medical assistance.
5. Firefighting measures		
5.1.	**Extinguishing media**	
	Appropriate media:	Titanyl sulfate solution does not burn and does not support fire. If the product is involved in fire, use foam, carbon dioxide or powder.
	Inappropriate media:	Contact with metals may release hydrogen which may create explosive mixtures in contact with air. In case of fire containers with titanyl sulfate solution may be cooled with water spray but only if closed. Prevent water to penetrate into the solution.
5.2.	**Specific hazards arising from the substance or mixture:**	corrosive mixture
5.3.	**Advice for firefighters:**	In case of fire, use water spray, foam, dry chemicals or CO_2. Protective gloves, protective clothes or apron, watertight shoes or boots, all from acid-proof materials. Protective goggles or face shield. See 8.2.2.
6. Accidental release measures		
6.1.	**Personal precautions protective equipment and emergency procedures**	Evacuate area. Wear acid-proof clothing, footwear and face shield or goggles within the hazardous area. Call fire brigade. Prevent contact of titanyl sulfate with metals.
6.1.1.	For non-emergency persons:	Remove unauthorized.
6.1.2.	For emergency responders:	Wear acid-proof clothing, footwear and face shield or goggles within the hazardous area. See 8.2.2.
6.2.	**Environmental precautions:**	Prevent drainage into water beds and sewer ducts.
6.3.	**Methods and material for containment and cleaning up:**	Neutralise titanyl sulfate with limestone or lime. Remove created gypsum and dispose it properly.
6.3.1.	Appropriate spillage retaining techniques (fencing, covering drains, retaining procedures):	Impoundment embankment.
6.3.2.	Appropriate cleaning procedures	
	Neutralization techniques:	Neutralise titanyl sulfate with limestone or lime. Remove created gypsum and dispose it properly.
	Decontamination techniques:	Pick up and arrange disposal without creating dust. Sweep up and showel. Keep in suitable, closed containers for disposal.
	Absorbent materials:	Non-combustible absorbents – diatomaceous earth, send, earth.
	Cleaning techniques:	Remove created gypsum and dispose it properly.
	Sucking techniques:	Procedure is possible if suitable equipment is present (corrosion resistant equipment)
	Required equipment for retaining /cleaning:	Shovels and suitable packaging

6.3.3.	Inappropriate cleaning or retaining techniques:	Rinsing into water or earth, sewage or watercourse
6.4.	**Reference to other sections:**	See 8.2.2.
7. Handling and storage		
7.1.	**Precautions for safe handling**	
7.1.1.	Recommendations shall be specified to:	Stored in special cold, dry and airy store room, protected from sun Containers with titanyl sulfate solution must be clearly labelled and closed. During warm season containers must be periodically vented.
	Safe handling of substance or mixture:	Familiarize operators handling the titanyl sulfate solution with hazards, appropriate handling, personal protective equipment, and first aid measures in case of accidents, assistance and environment protection. Shower must be available in the vicinity of storage area.
	Prevent handling of incompatible substances or mixtures:	Do not store the following substances in the same storage space: chlorates, chromates, nitrates, and the like, flammable substances, HCl, HNO_3, leaches, and metallic dust
	Operations and conditions which create new risks by altering the properties of the substance or mixture, and to appropriate countermeasure:	Do not store in steel containers
	Reduce the release of the substance or mixture to the environment:	Storage floor must be made of acid resistant material.
7.1.2.	General working hygiene (prohibited eating, drinking and smoking within working area; washing hands …):	No smoking inside storage area, no food and beverage. Washing hands.
7.2.	**Conditions for safe storage, including any incompatibilities**	
	Management of risk associated with:	
	- explosive atmospheres:	Stored in special cold, dry and airy store room, protected from sun Containers with titanyl sulfate solution must be clearly labelled and closed. During warm season containers must be periodically vented
	- corrosive substances:	Storage floor must be made of acid resistant material. The storage room must have drenage in summary cave, where titanyl sulfate – solution can be neutralised.
	- incompatible substances or mixtures:	Do not store the following substances in the same storage space: chlorates, chromates, nitrates, and the like, flammable substances, HCl, HNO_3, leaches, and metallic dust
	- evaporation substances:	Non volatile
	- potential ignition sources:	No smoking inside storage area.
	How to control the effects of	
	- weather conditions:	No water contact with titanyl sulfate- solution
	- ambient pressure:	Periodically vented.
	- temperature:	Not under – 20 °C
	- sunlight:	No direct sunlight
	- humidity:	Prevent contact wet air and titanyl sulfate -solution
	Securing integrity of substance or mixture by use of:	
	- stabilisers:	Not important

	- antioxidants:	Not important
	Other advice including:	
	- ventilation requirements;	Storage room must be ventilated.
	- specific designs for storage rooms or vessels (including retention walls and ventilation):	Storage floor must be made of acid resistant material.
	- quantity limitations regarding storage conditions:	If it is specifically provided.
	- packaging compatibility:	Only packaging for class 8, packaging group II (ADR). Packaging P001 and IBC02
7.3.	**Specific end use(s):**	See 1.2.

8. Exposure control/ personal protection

8.1.	**Control parameters**	
8.1.1.	-Limit values (MV): -Limit values (BAT):	Sulfuric acid aerosol – air concentration MV at workplace: 15 mg/m^3 TLV 0 10 mg/m^3 (5 mg/m^3 resp.)
	DNEL:	Not provided.
	PNEC:	Not provided.
8.2.	**Exposure control**	
8.2.1.	Appropriate engineering controls:	See 5.,6.,7.,10.,11.,12. and 13. All must be permanently followed and controlled.
8.2.2.	Personal protective equipment:	All personal protective equipment must be in technically perfect condition and clean. Never use damaged equipment. Constant control is necessary
	- respiratory protection:	Not required for work, in case of fire see point 5.3.
	- skin protection:	work clothes SIST EN ISO 13688
	- hand protection:	acid-resistant gloves (FKM-fluorinated rubber) (SIST EN ISO 374), penetration time> 60 minutes, glove thickness: minimum 1.2 mm
	- eye/face protection:	tight-fitting safety goggles or face shield (SIST EN 166)
	- heat radiation protection:	Not important.
	Other:	Not important.
8.2.3.	Environment exposure control:	See 5.,6.,7.,10.,11.,12. and 13. All must be permanently followed and controlled.

9. Physical and chemical properties

9.1.	**Information on basic physical and chemical properties:**	
	- Physical state:	liquid
	- color	Pale brown-yellow, milky
	- odor:	no
	pH:	Under 1
	Melting/freezing point:	Under – 20 °C
	Boiling point or initial boiling point and boiling range	120 -122 °C

	Flash point:	Not flammable
	Auto-ignition temperature:	Not flammable
	flammability (solid, gas):	Not flammable
	Lower and upper explosion limit:	Not flammable
	Vapor pressure:	No data available
	Density and/or relative density:	1410 g /L (at 25 ºC)
	Solubility:	Unlimited in water
	partition coefficient: n-octanol-water:	No data available
	Decomposition temperature:	No data available
	Kinematic viscosity:	35 mPas at 30ºC
	Relative vapour density:	No data available
9.2.	**Other information:**	Non
9.2.1	**Information on physical hazard classes**	
	-Explosives:	Not flammable
	- Flammable gases:	Not flammable
	- Aerosols:	No data
	- Oxidising gases:	No data
	- Flammable liquids:	Not flammable
	- Flammable solids:	Not flammable
	- Corrosive to metals:	yes
9.2.2	**Other safety-related parameters:**	Non

10. Stability and reactivity

10.1.	**Reactivity:**	Non-reactive.
10.2.	**Chemical stability:**	Stabile in normal conditions of use and transport.
10.3.	**Possible hazardous reactions:**	If involved in fire, dangerous gases can occur such as SO_2 or SO_3. In contact with metal H_2 occur.
10.4.	**Conditions to avoid:**	Dilute by pouring the titanyl sulfate solution into water, and not vice versa.
10.5.	**Incompatible materials:**	chlorates, chromates, nitrates, and the like, flammable substances, HCl, HNO_3, leaches, and metallic dust.
10.6.	**Hazardous decomposition products:**	SO_2, SO_3 and H_2O (water vapor -aerosols)

11. Toxicological data

11.1.	**Information on hazard classes as defined in Regulation (EC) No 1272/2008**	
	- Acute toxicity:	Originating from its corrosiveness. In case of ingestion may cause injuries of tongue, gullet, and stomach.
	- Skin corrosion/irritation:	Causes skin injuries which heal badly. Skin corrosion, hazard categories 1A.
	- Serious eye damage/irritation:	Causes eyes injuries which heal badly.

		Skin corrosion, hazard categories 1.
	- Respiratory or skin sensitisation:	In case of vapour inhalation causes injuries of mouth cavity and respiratory organs.
	- Germ cell mutagenicity:	Not mutagenic
	- Carcinogenicity:	Inhaling of vapours has potential role of development laryngeal cancer
	- Toxicity for reproduction:	Not available
	- STOT – single exposure:	Skin corrosion, hazard categories 1A.
	- STOT – repeated exposure:	Skin corrosion, hazard categories 1A.
	- Aspiration hazard:	No data
	- Endocrine disrupting properties	No data
12. Ecological information		
12.1.	**Toxicity:**	Skin corrosion, hazard categories 1A.
12.2.	**Persistence and degradability:**	Titanyl sulfate solution may be extracted from water only by neutralization, not by biological cleaning.
12.3.	**Bioaccumulative potential:**	do not accumulate in living organisms
12.4.	**Mobility in soil:**	Liquid, limitless mixing with water.
12.5.	**Results of PBT and vPvB assessment:**	Not classified as PBT or VPvB
12.6.	**Endocrine disrupting properties:**	No data
12.7.	**Other adversative effects:**	Sulfuric acid dissociates into hydrogen ions and sulfate ions. Hydrogen ions reduce pH value of local environment and can destroyed living organisms
13. Disposal considerations		
13.1.	**Waste treatment methods:**	Titanyl sulfate solution may not be disposed at any waste disposal site. In case of small quantities acid should be neutralized until pH = 6.2 – 9.1, and in case of large quantities acid should be neutralized with lime, and the created gypsum removed to disposal site in accordance with local state and federal waste disposal regulations.
14. Transport information		
	ADR, RID, AND, IMDG, ICAO-TI/IATA-DGR	
14.1.	**UN number or ID number:**	1760
14.2.	**UN proper shipping name:**	CORROSIVE LIQUID N.O.S. (technical titanyl sulfate - solution)
14.3	**Transport hazard class(es):**	8
14.4.	**Packaging group:**	II
14.5.	**Environmental hazards:**	Sulfuric acid dissociates into hydrogen ions and sulfate ions. Hydrogen ions reduce pH value of local environment and can destroyed living organisms.
14.6.	**Special precautions for user:**	not required
14.7.	**Maritime transport in bulk according to IMO instruments:**	Titanyl sulfate - the solution is a liquid
15. Regulatory information		
15.1.	Safety, health and environmental regulations/legislation specific for the substance	European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

	or mixture:	Chemicals Act. Rules on classification, labelling and packaging of dangerous substances. Occupational Safety and Health Act
15.2.	**Chemical safety assessment:**	yes
16. Other information		
	Amendments made in the revised edition:	Safety data sheet is amended in all sections in order to harmonize with applicable legislation.
	List of relevant, hazard statements, safety phrases and/or precautionary statements. Write out the full text of any statement which are not written out in full under Sections 2 to 15:	See 2.1. and 2.2
	in the case of mixtures, an indication of which of the methods of evaluating information referred to in Article 9 of Regulation (EC) No 1272/2008 was used for the purpose of classification:	According to the calculation method
	Training of personnel:	In accordance with the law on safety and health at work.
	Key literature references and sources for data:	Safety data sheets Regulations REACH and CLP Registrant: CINKARNA CELJE, D.D. CELJE SLOVENIJA
	A key or legend to abbreviation and acronyms used in the safety data sheet:	PBT – persistent, bio accumulative and toxic vPvB – very persistent and very bio accumulative STOT – specific target organ toxicity DNEL – derived no effect levels PNEC – predicted no effect concentration ADR – European agreement concerning the international carriage of dangerous goods by road RID – International rule for transport of dangerous substances by railway ADN – European agreement concerning the International carriage of dangerous goods by inland waterways IMDG – International maritime dangerous goods code ICAO-TI – Technical instructions for the safe transport of dangerous goods by air IATA – International air transport association
Data specified above are based on research and experience of the supplier at the time of compiling the present MSDS. The supplier may not assume responsibility in case the buyer/user should fail to use the product in accordance with the relevant suggestions and recommendations. No information contained in the present SMDS may release the buyer/user from liability to strictly follow any legal requirements regarding his business activities.		