Safety Data Sheet

Trade name: TITANYL SULFATE - SOLUTION

Issued on: 27 February, 2025
Revised on: /
Version: 0

1. Identification of the substance/mixture and of the company/undertaking			
1.1.	**Product identifier (Product registration number, nanoform, UFI):**	Titanyl sulfate – solution UFI: EN10-70M6 Q00C-EX02 (01-2119560603-42-000)	
1.2.	**Relevant identified uses of the substance/mixture and uses advised against:**	Manufacture of substances.	
	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 ulica 26, 3000 CELJE, SLOVENIJA, +386 3 427 60 00	
1.3.3.	E-Mail (competent person):	natasa.gotlin-korazija@cinkarna.si	
1.4.	**Emergency phone number:**	If there is a health risk, seek medical advice. Additional information is available during working hours, from 7:00 to 15:00: +386 3 427 65 85 +386 3 427 60 00	
2. Hazards identification			
2.1.	**Classification of substances or mixture:**	Regulation (EC) No 1272/2008 Met. Corr. 1; H290 Skin Corr. 1A; H314 Eye Dam. 1; H318	
2.2.	**Label elements:**	**Label elements according to Regulation (EC) No 1272/2008 (CLP)**  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 person to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	

		P310 Immediately call a POISON CENTER or doctor/physician. P405: Store locked 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:**	This substance/mixture does not contain any substances identified as endocrine disruptors. This substance/mixture is not classified as PBT or vPvB.

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 H_2SO_4	7664-93-9 231-639-5 016-020-00-8	01-2119458838-20-0082	32% – 39%	Skin corr.1A H314	Eye Irrit. 2; H319: 5 % ≤ C < 15 % Skin Corr. 1A; H314: C ≥ 15 % Skin Irrit. 2; H315: 5 % ≤ C < 15 %
Titanium oxide sulphate $TiOSO_4$	13825-74-6 237-523-0	01-2119560603-42-0003	10% - 12% expressed as TiO_2	Met. Corr. 1 Skin Corr. 1A Eye Dam. 1 H290 H314 H318	Not applicable.

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 shiels. 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 personnel:	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.
	Vacuuming 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 storeroom, protected from sun. Containers with titanyl sulfate solution must be clearly labelled and closed. During warm season containers must be periodically vented.
	Safe handing 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 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 that may create new risks by altering the properties of the substance or mixture, and appropriate risk control measures:	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 storeroom, 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 compatibilities:	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.	- Occupational exposure limit values (MV): - Biological limit values (BAT):	Sulfuric acid aerosol – airborne concentration Occupational Exposure Limit (OEL): 0.05 mg/m³ (Regulations on the Protection of Workers from Risks Related to Exposure to Chemical Agents at Work, Official Gazette of the Republic of Slovenia, Nos. 72/21, 29/24, 26/25)
	DNEL:	Sulfuric acid: 0.05 mg/m³ Total daily worker exposure: 0.5 mg/8 h, calculated on the basis of an inhaled air volume of 1.25 m³/h over an 8-hour working period.
	PNEC:	Not determined. Sulfuric acid rapidly dissociates in water into hydrogen and sulfate ions; the primary environmental effect is associated with a change in, or lowering of, the pH of the local environment.
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:	Wear a half mask complying with SIST EN 140, providing a protection factor (PF) of 4, fitted with a Class 2 gas filter complying with SIST EN 14387, suitable for acid gases (filter type E, yellow colour code).

		Not required for work, in case of fire see point 5.3.
	- skin protection:	Acid-resistant protective clothing and cap complying with SIST EN 13034, Type 6, where there is a risk of splashes or spills, and safety boots complying with SIST EN ISO 20345.
	- hand protection:	Acid-resistant gloves (FKM-fluorinated rubber) (SIST EN ISO 374), penetration time > 60 minutes, gloves thickness: minimum 1.2 mm.
	- eye/face protection:	Tight-fitting safety goggles or face shield SIST EN ISO 16321-1 (SIST EN 166).
	- heat radiation protection:	Mixing with water is highly exothermic and generates a large amount of heat, which may cause splashing of the liquid or, in extreme cases, an explosion.
	Other:	Not important.
8.2.3.	Environmental 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
	- Colour	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°C – 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°C)
	Solubility:	Unlimited in water
	Partition coefficient: n-octanol-water:	No data available
	Decomposition temperature:	No data available
	Kinematic viscosity:	35 mPas at 30°C
	Relative vapour density:	No data available
9.2.	**Other information:**	None
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:**	None
10. Stability and reactivity		

10.1.	**Reactivity:**	Non-reactive.
10.2.	**Chemical stability:**	Stable under recommended storage and handling conditions.
10.3.	**Possibility of hazardous reactions:**	In a fire, hazardous gases such as SO_2 or SO_3 may be released. Contact with metals may generate H_2.
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:	Effects are due to its corrosive properties. If ingested, it may damage the tongue, oesophagus and stomach.
	- Skin corrosion/irritation:	Causes severe skin damage with poor healing. Classified as Skin Corr. 1A.
	- Serious eye damage/irritation:	Causes serious eye damage with poor healing. Classified as Eye Dam. 1.
	- Respiratory or skin sensitisation:	In case of vapour inhalation causes injuries of mouth cavity and respiratory organs.
	- Germ cell mutagenicity:	Not mutagenic.
	- Carcinogenicity:	Inhalation of acid aerosols may contribute to the development of laryngeal cancer.
	- Reproductive toxicity:	Not available.
	- STOT – single exposure:	Skin corrosion, hazard categories 1A.
	- STOT – repeated exposure:	Skin corrosion, hazard categories 1A.
	- Aspiration hazard:	No data.
11.2.	**Information on other hazards**	
	- Endocrine disrupting properties:	The mixture does not contain substances at concentrations of 0.1% or above identified as having endocrine disrupting properties in accordance with Regulation (EU) 2017/2100 or Regulation (EU) 2018/605, nor substances included in the list established in accordance with Article 59(1) of Regulation (EC) No 1907/2006 for endocrine disrupting properties.
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:**	The mixture does not contain substances at concentrations of 0.1% or above identified as having endocrine disrupting properties in accordance with Regulation (EU) 2017/2100 or Regulation (EU) 2018/605, nor substances included in the list established in accordance with Article 59(1) of Regulation (EC) No 1907/2006 for endocrine disrupting properties.
12.7.	**Other adverse 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, national and EU waste 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:**	Yes. 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:**	The product is corrosive. Avoid contact with skin, eyes and clothing. Avoid inhalation of mist or aerosols. Use only corrosion-resistant packaging and equipment. Keep containers tightly closed and protected from incompatible materials, especially metals.
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 or mixture:	CLP Regulation. REACH Regulation. Occupational Safety and Health Act. Rules on personal protective equipment used by workers at the workplace. Rules on the protection of workers from risks related to exposure to chemical agents at work. List of harmonised standards, the application of which provides a presumption of conformity of the product with the applicable requirements. Rules on requirements for ensuring the safety and health of workers at workplaces. Waste Regulation. Regulation on packaging and packaging waste management.
15.2.	**Chemical safety assessment:**	Yes.
16. Other information		
	Changes made in this revised edition:	All sections of the safety data sheet have been revised to ensure compliance with applicable legislation.
	Full text of all relevant hazard statements and precautionary statements referred to in this safety data sheet, where not already provided in full in Sections 2 to 15.	See 2.1. and 2.2.
	For mixtures, indicate which method for evaluating information, as referred to in Article 9 of Regulation (EC) No 1272/2008, was used for classification.	According to the calculation method.
	Personnel training:	In accordance with the law on safety and health at work.
	Key literature references and data sources:	The information provided in this safety data sheet is based on safety data sheets of raw materials, applicable EU chemicals legislation, including Regulation (EC) No 1907/2006 (REACH), Regulation (EC) No 1272/2008 (CLP) and Commission Regulation (EU) 2020/878.
	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 MGDF – Multi-Modal Dangerous Goods Form
The information provided in this Safety Data Sheet is based on our knowledge of the product at the time of its preparation. If the customer does not use the product in accordance with the proposed or recommended instructions, the customer is responsible for any consequences arising from such use. The user is responsible for using the product in accordance with the instructions and for ensuring compliance with all applicable legislation and regulations.		