SULFURIC ACID 98%

REVISION DATE: 09/17/2022

1. - PRODUCT AND COMPANY IDENTIFICATION

Product name: SULFURIC ACID 98%
Internal Code of product identification: 109.01.9.
Company name: USIQUÍMICA DO BRASIL LTDA.
Address: Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.
Company Phone: + 5511 3821-7000 (PBX system) - + 5511 2481-3355.
Emergency phone: SUATRANS - COTEC - Environmental Emergency.
DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
193 – Firefighters.

Main recommended uses for the substance: Textile, metallurgy, rubber, industrial gases, soap and detergents, sugar and alcohol, electroplating, fertilizers, mineral treatment, sulfate manufacturing and chemical industries in general.

2. - HAZARD IDENTIFICATION

Classification of Substance
Acute toxicity - Oral, Category 5,
Acute Toxicity - Inhalation, Category 2,
Skin corrosion/irritation, Category 1A,
Serious eye damage/eye irritation, Category 1,
Toxicity to specific target organs - Single Exposure - Category 1,
Specific target organ toxicity - Repeated exposure, Category 1, Hazardous to the aquatic environment - Acute, Category 3.

Most important hazards:
Sulfuric acid is a potent irritant of the respiratory tract, skin and eyes. On the skin, it produces severe burns with intense cicatricial fibrosis and functional limitations. In accidents with the eyes, it can cause serious ulcerative lesions, cataracts and glaucoma. Although ingestion is unlikely, it can cause severe damage to the digestive system. Handle the product safely.
Product Effects:
Inhalation of vapor or mist may cause coughing, sneezing, nosebleeds, bronchospasm, difficulty breathing and pulmonary edema. Ingestion causes corrosion of mucous membranes in the mouth, throat and esophagus, severe epigastric pain with coffee grounds-like nausea and vomiting, glottis edema and choking.
Adverse effects on human health:
The severe burns produced by the contact of sulfuric acid with the skin evolve with slowly healing ulcerated lesions, cicatricial fibrosis and functional limitations. Extensive burns can lead to death. Signs of shock such as cold, clammy sweat, rapid pulse, shallow breathing, and restlessness may appear after ingestion or extensive skin contact. Shock is the most frequent cause of death in serious accidents. Contact with the eyes produces deep corneal ulceration, keratoconjunctivitis and eyelid injuries with serious sequelae, including blindness. Environmental effects:
It can contaminate watercourses, making them unfit for any purpose. High concentrations in the air endanger human and animal life.
Physical and chemical hazards:
Sulfuric acid can react violently with acetic acid, ketones, acrylonitrile, aniline, ethylene glycol, iron, perchloric acid, isocyanides, sodium, sodium carbonate, among others.
Specific hazards:
Avoid exposing the product to heat and incompatible materials.
Main symptoms:
Inhalation of vapor or mist may cause coughing, sneezing, nosebleeds, bronchospasm, difficulty breathing and pulmonary edema.

Emergency overview:
Depending on the proportions isolate and evacuate the area. In case of leakage and/or spillage, try to block the leakage, contain the spilled liquid or transfer the product. During emergency care, keep the wind blowing your back. Access for people in contaminated areas should only be allowed if they are wearing clothes

and adequate respiratory protection.

GHS label elements, including precautionary phrases.

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	**Commercial Name:** SULFURIC ACID 98% **Synonym:** HYDROGEN SULPHATE, OIL OF VITRIOL, BATTERY ACID. Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
Chemical composition	H_2SO_4 , minimum 98%.
Hazard pictograms	
Warning words	**DANGER**
Danger phrases	H303 - May be harmful if swallowed H330 - Fatal if inhaled H314 - Causes severe skin burns and eye damage H318 - Causes serious eye damage H370 - Causes damage to the organs of the respiratory system H372 - Causes damage to organs of the respiratory system through prolonged or repeated exposure H402 - Harmful to aquatic organisms
Caution Phrases	P301+P330+P331 - IN CASE OF INGESTION: Rinse your mouth. DO NOT induce vomiting. P303 + P361 + P353- IN CASE OF SKIN CONTACT (or with the hair): Remove immediately all contaminated clothing. Wash the skin with water/take a shower. P304 + P340- IN CASE OF INHALATION: Remove the person to a ventilated area and keep the person in a rest position that does not make it difficult to breathe. P305 + P351 + P338 - IN CASE OF EYE CONTACT: Rinse thoroughly with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing. P308 + P311- IN CASE OF exposure or suspected exposure: Contact a TOXICOLOGICAL INFORMATION CENTER/doctor. P361 + P364- Remove at once all contaminated clothing and wash it before using it again.

Other hazards which do not result in classification: Not available.

3. - COMPOSITION AND INFORMATION ON THE INGREDIENTS

Substance: SULFURIC ACID 98%
Common chemical name or generic name: SULFURIC ACID.
Synonym: Hydrogen sulfate, oil of vitriol, battery acid. **Chemical**
Abstract Service (CAS No): 7664-93-9.
Chemical composition of the substance:
Minimum, 98.0% sulfuric acid.
There are no impurities that contribute to the danger.

4. - FIRST AID MEASURES

First aid measures:
Inhalation: Remove casualty to uncontaminated, ventilated area and administer oxygen, if available. Apply

resuscitation maneuvers in case of cardiac arrest. Immediately forward to the nearest hospital.
Skin contact: Carefully remove contaminated clothing and shoes and wash the affected parts with plenty of running water for 15 minutes.
Eye contact: Immediately wash eyes with running water for 15 minutes, lifting eyelids to allow maximum removal of product. After these cares refer immediately to the ophthalmologist.
Ingestion: Never give anything by mouth to unconscious or convulsive people. The conscious and alert injured person can drink water or milk. Do not induce vomiting. If vomiting occurs spontaneously, the victim must be laid on their side to prevent pulmonary aspiration. Forward it to the doctor informing the product's characteristics.

Most important symptoms and effects, both acute and delayed.
Actions that must be avoided: Do not induce vomiting.
Brief description of the main symptoms and effects: Inhalation of vapor or mist may cause coughing, sneezing, nosebleeds, bronchospasm, difficulty breathing and pulmonary edema. Ingestion causes corrosion of mucous membranes in the mouth, throat and esophagus, severe epigastric pain with coffee grounds-like nausea and vomiting, glottis edema and choking.
Protection of the first aid provider: Use the indicated personal protection equipment.
Notes to the physician: The systemic toxic action of sulfuric acid causes alkaline depletion, with acidosis that affects the nervous system producing agitation, unsteady gait and weakness. Overt signs of respiratory tract irritation or respiratory depression require follow-up with arterial blood gases and chest X-rays. Gastric lavages must be performed by experienced personnel, considering the risk of perforation and vomiting induction by passing a nasogastric tube and introducing liquids for its performance. Aspiration, which can occur during ingestion and/or vomiting, poses a significant risk to life. Consider the risk of gastrointestinal perforation in the acute phase and late pyloric obstruction. Contact with the eye may produce deep corneal ulceration. Treat skin irritation or burns with conventional remedies.

5. - FIREFIGHTING MEASURES

Suitable extinguishing measures: The product is not combustible. When involved in fire, use appropriate extinguishing media to fight it. Only use water, with great caution and in cases of absolute necessity. Use water mist only to keep fire-exposed containers cool.
Inappropriate extinguishing measures: The product is not combustible. The application of water directly to sulfuric acid results in a violent release of heat, which can throw the material a distance.
Substance-specific hazards: Sulfuric acid is a strong dehydrating agent. When reacting with organic materials, it produces sufficient heat for ignition, and may also cause combustion when in contact with finely divided materials. In contact with some metals it can release hydrogen.
Special Methods: Avoid the application of excess water, as there may be contamination of water courses.
Firefighting team protection measures: Use personal protective equipment, especially respiratory protection. In case of fire there is the possibility of decomposition with the release of irritating toxic gases (SOx) . Wear self-contained or blown air mask and acid-resistant PVC clothing.

6. - CONTROL MEASURES FOR SPILLING OR LEAKING

Personal precautions, protective equipment and emergency procedures.
For the staff that is not part of the emergency services:
Removal of ignition sources: Sulfuric acid is not combustible. As it is oxidizing, avoid contact with other fuels or organic materials.
Prevention of inhalation and contact with skin, mucous membranes and eyes: Use personal protective equipment appropriate. **For personnel who are part of the emergency services:**
Wear personal protective equipment, isolate the area, remove all organics or fuel, and provide adequate ventilation to disperse the gas.
Precautions to the environment: It can contaminate watercourses, making them unfit for any purpose. High concentrations in the air endanger human and animal life. Storage sites must have containment dikes.
Methods and material for containment and cleaning up
Recovery: Try to contain the spilled liquid with a sand or earth dam. If possible, transfer the product. Never use organic material to absorb spillage.
Neutralization: Acid neutralization can be achieved with the addition of a basic, alkaline or caustic substance. Neutralizing

slowly and carefully with lime if possible. The neutralization reaction releases heat. For small amounts, cautiously add excess water with vigorous agitation. Adjust pH to neutral, separate insoluble solids or liquids and pack them with proper disposal as waste. The reaction can generate heat and fumes, which can be controlled by the rate of addition. Monitoring by a specialist from the environmental agency is recommended. Disposal: Neutralize the residue slowly and carefully before taking it to final disposal.

7. - HANDLING AND STORAGE

Handling:
Technical measures Using only in areas provided with adequate exhaust ventilation. Providing the product handling area with a set of emergency shower and eye wash. Handling must only be done with the indicated PPE and under safe conditions.
Prevention of worker's exposure: Avoiding the formation of vapors/aerosols. Working with exhaust / chimney. Do not inhale the substance/mixture. Using specific PPE's - splash goggles, face shield, PVC gloves and protective clothing. Avoid inhaling alkaline vapors.
Wash after handling and decontaminate PPE's after use. PPE's must be approved for use only with the respective CAs – Certificates of Approval.
Precautions and guidelines for safe handling: Use personal protective equipment (PPE) to avoid direct contact with the product. Handling the product in a well-ventilated place. Do not mix or store the product in contact with incompatible materials.

Storage:
Appropriate: Keep container tightly closed in a dry, cool and well-ventilated area. Never expose the container containing the product directly to sunlight.
To avoid: Contact with incompatible materials.
Hygiene measures:
Appropriate: Always sanitize your hands before handling any food, as there is a risk of food contamination. Contaminated clothing must be washed and sanitized before use. Always keep gloves free from moisture and decontaminated.
Inappropriate: Direct contact with the product and/or its residues.
Technical measures
Safe materials for packaging:
Recommendations: Always use specified material compatible with sulfuric acid. (Piping: cast iron / Tank: Carbon steel - ASTM - A - 283 + rubber coating + anti-acid brick).
To avoid: See previous information.

8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Parameters of specific control:
Occupational exposure limits: ACGIH: 1 mg/m3.
Biological indicators: See table I of NR 7.
Other limits and values: Not considered.
Measures of engineering control: To reduce the possibility of a health risk, ensure sufficient ventilation or the existence of exhaust in the room to control ambient concentration to low levels.
Recommended procedures for monitoring: subject exposed individuals to periodic tests of respiratory function; periodic medical examination should emphasize the possibility of bronchial hyperreactivity occurring in long-term exposures.
Personal Protective Equipment:
Respiratory protection: Use respiratory protection if necessary. Panorama mask with filter against acid or multipurpose gases. In large concentrations use autonomous mask.
Attention: masks with mechanical filters do not protect workers exposed to oxygen deficient atmosphere
Hand protection: Wear acid resistant gloves.
Eye protection: Wear chemical safety glasses or face shield.
Protection of the skin and body: Wear acid resistant PVC clothing.
Special precautions: Equip the area with emergency showers and eyewash stations. Never eat, drink or smoke in an area of

work. Practice good personal hygiene especially before eating, drinking and smoking. Separate contaminated tools and clothing, ensuring that they are effectively washed before reuse.
Hygiene measures: Keep workplaces within hygiene standards. Periodically make employees aware of safe handling and the risks posed by sulfuric acid.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.
Form: Viscous liquid (may solidify below 11-C).
Color: Colorless.
Odor: Characteristic odor.
pH: Acid.
Specific temperatures:
Boiling point: 290°C (literature data).
Melting point: 10°C (literature data).
Decomposition temperature: Not determined.
Density: 1.832 g/cm3 (20°C).
Solubility: Soluble in water (heat release).
Further information: Reacts violently with water, releasing heat. Always add acid to water or other diluent. Never add water to acid.

10. - STABILITY AND REACTIVITY

Specific conditions:
Instability: Sulfuric acid is stable when stored at room temperature, in closed equipment, under normal storage and handling conditions. No polymerization occurs.
Dangerous reactions: Reacts with products listed below.
Conditions to avoid: Avoid contact with combustible and organic materials as it can cause fire. In contact with some metals it can release hydrogen.
Materials or incompatible substances: Sulfuric acid can react violently with acetic acid, ketones, acrylonitrile, aniline, ethylene glycol, iron, perchloric acid, isocyanides, sodium, sodium carbonate, among others.
Hazardous decomposition products Under the action of fire, it can decompose releasing toxic gases (SOx).

11. - TOXICOLOGICAL INFORMATION

Information according to the different routes of exposure:
Acute toxicity:
LD_{50} (oral in rats): 2,140 mg/kg
LC_{50} (inhalation in rats): 510 mg/m3/2h

Skin corrosion/irritation: Severe burns produced by contact of acid with the skin evolve with slowly healing ulcerated lesions, cicatricial fibrosis and functional limitations.
Ingestion: Severe burns to the mouth and throat, as well as perforation of the esophagus and stomach. Vomiting with blood.
Inhalation: Inhalation of vapor or mist may cause coughing, sneezing, nosebleeds, bronchospasm, difficulty breathing and pulmonary edema. Ingestion causes corrosion of mucous membranes in the mouth, throat and esophagus, severe epigastric pain with coffee grounds-like nausea and vomiting, glottis edema and choking.
Severe ocular lesions/eye irritation: Causes serious eye damage. **Danger of blindness!**
Respiratory or skin sensitization: Such an effect is not expected.
Germ cell mutagenicity: Such an effect is not expected.
Carcinogenicity: Sulfuric acid is not considered carcinogenic, but the International Agency for Research on Cancer - IARC lists it in Group I (carcinogenic to humans), when mixed with strong inorganic acids, in the form of mists, in chronic exposures. Although epidemiological studies cited in the literature establish this relationship, sulfuric acid has not been confirmed as a human carcinogen so far. The American Conference of Governmental Industrial Hygienists - ACGIH considers it a suspected human carcinogen.
Reproductive toxicity: Such an effect is not expected.
Specific target organ toxicity- single exposure: The substance or mixture is not classified as a specific target organ toxicant, single exposure.
Specific target organ toxicity - repeated exposure: The substance or mixture is not classified as a

specific target organ toxicant, repeated exposure.
Aspiration hazard: Classification criteria were not satisfied with respect to available data.

12. - ECOLOGICAL INFORMATION

- Environmental effects, behaviors and impacts of the product:
Mobility: The product is an energetic oxidizing.
Persistence/ degradability: The released product tends to the formation of SOx.
Bioaccumulation: Contaminates the soil, requiring neutralization and recomposition work
Expected behavior: Rapid dissipation of the gas cloud.
Environmental impact: Due to the corrosive nature of sulfuric acid, animals exposed to this product may suffer tissue damage and lead to death, depending on the environmental concentration. Plants contaminated with the product may be adversely affected or destroyed.
Ecotoxicity: Sulfuric acid is soluble in water and even at low concentrations it becomes harmful to aquatic life due to pH changes.

13. - CONSIDERATIONS ON FINAL DISPOSAL

Recommended methods for final disposal:
The treatment and disposal of product residues must be done in a suitable environment, by people trained in the use of special equipment and the recommended PPE's to avoid contact with the product, its vapors or mists. Leaks must be contained and collected for later disposal after neutralization. Neutralize slowly and carefully with lime if possible.
Product:
Ensure all Federal, State and local agencies receive proper notice of spills and disposal methods. CONAMA Resolution 005/1993, Law No. 12,305, as of August 2, 2010 (National Solid Waste Policy).
Product waste:
Consult environmental regulatory agencies for advice on acceptable regulatory practices. Come in contact with relevant local authorities. It can be incinerated when in compliance with local regulations. Or dispose of in an approved chemical waste landfill.
Used Package:
Empty containers must be drained and covered before handling and transport operations. If the package is not properly washed and decontaminated, it is considered to contain the product.

14. - TRANSPORT INFORMATION

nationals and internationals
Land Regulations:
Resolution No. 5947/2021 of the Brazilian National Land Transport Agency (ANTT), Approves the Complementary Instructions to the Regulation of Land Transport of Dangerous Goods and its amendments.
UN number: 1830.
Appropriate name for shipment: SULFURIC ACID, greater than 51% acid.
Risk class: 8.
Risk number: 80.
Packing group: II

Waterway:
DPC – Directorate of Ports and Coasts (Transport in Brazilian waters) Maritime Authority Regulations (NORMAM) NORMAM 01/DPC: Vessels Used in Open-seas Navigation
UN number: 1830.
Appropriate name for shipment: SULFURIC ACID, greater than 51% acid.
Risk class: 8.
Risk number: 80.
Packing group: II
EmS: F-A,S-B

- Air Transport:

ANAC - National Civil Aviation Agency - Resolution No. 129 as of January 8, 2009
RBAC N°175 - (BRAZILIAN CIVIL AVIATION REGULATION) - TRANSPORTATION OF DANGEROUS ITEMS IN CIVIL AIRCRAFT
IS No. 175-001 - SUPPLEMENTARY INSTRUCTION - IS
ICAO - "International Civil Aviation Organization" - Doc 9284-NA/905
IATA - "International Air Transport Association"
Dangerous Goods Regulation (DGR)
UN number: 1830.
Appropriate name for shipment: SULFURIC ACID, greater than 51% acid.
Risk class: 8.
Risk number: 80.
Packing group: II

15. - REGULATORY INFORMATION

Specific regulations for the chemical product:
Federal Decree No. 2,657, as of July 3, 1998;
Standard ABNT-NBR 14725:2014;
Ordinance No. 229, as of May 24, 2011 – Changes Regulatory Standard No. 26.

16. - OTHER INFORMATION

The information on this sheet corresponds to the current state of our knowledge and experience of the product and is not exhaustive. It applies to the product under the conditions specified, unless otherwise stated. In case of combinations or mixtures, make sure that no new danger can appear. This information does not, in any case, exempt the user of the product from complying with all legislative, regulatory and administrative texts relating to the product, safety, hygiene and protection of human and environmental health.

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