

**SULFONIC ACID 90%**

REVISION DATE: 09/17/2022

1. - PRODUCT AND COMPANY IDENTIFICATION**Product name:** SULFONIC ACID 90%**Internal Code of product identification:** 107.23.1**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: Formulation of liquid, paste and powder detergents, thickeners, disinfectants (such as anionic surfactants), automotive shampoos, emulsifying agent for pesticides and asphalt manufacturing, textile and leather auxiliaries, degreasers when combined with organic solvent.

2. - HAZARD IDENTIFICATION**Classification of Substance****Exposure effects:**

Corrosive to metals - Category 1.

Acute Toxicity - Oral - Category 3.

Acute toxicity - Dermal - Category 1.

Skin corrosion/irritation - Category 2.

Serious eye damage / eye irritation - Category 1.

Acute Toxicity - Inhalation - Category 1.

Toxicity to specific target organs - Single Exposure- Category 3.

Hazardous to the aquatic environment - Acute - Category 1.

Hazardous to the aquatic environment - Chronic - Category 1.

Emergency overview: Depending on the proportions, isolate and evacuate the area in case of leakage and/or spillage. Try to block the leak, contain the spilled liquid or transfer the product. Keep the wind blowing at your back during emergency care. Access by people to contaminated areas should only be allowed if they are wearing specific clothing and adequate respiratory protection, with filters for acidic gases (or combined) or self-contained or air-induction masks.

GHS labeling classification, including precautionary statements:

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	Technical name: LINEAR ALKYL ALKYL BENZENE SULFONIC ACID. Trade name: SULFONIC ACID 90% Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
Chemical composition	Actives $C_nH_{2n}SO_3H$, 90 %.
Hazard pictograms	
Warning words	DANGER
Danger phrases	H290 May be corrosive to metals. H302 Harmful if swallowed. H315 Causes irritation to the skin. H318 Causes serious eye damage. H335 May cause irritation to the respiratory tracts.

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	H401 Toxic to aquatic organisms.
Caution Phrases	P261 Avoid breathing dust/fume/gas/mist/vapors/spray. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P302 IN CASE OF SKIN CONTACT: Wash with plenty soap and water. P304 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 IN CASE OF CONTACT WITH EYES: Rinse thoroughly with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing. P390 Absorb spilled product to avoid material damage. P406 Store in a corrosion resistant container with a strong inner liner.

Other hazards which do not result in classification: Unknown

3. - COMPOSITION AND INFORMATION ON THE INGREDIENTS**Substance:** SULFONIC ACID 90%**Common chemical name or generic name:** LINEAR SULFONIC ACID.**Synonym:** Linear alkylbenzene sulfonic acid, mixed alkylbenzene sulfonic acid, lauryl benzene sulfonic acid, dodecylbenzenesulfonic acid.**Chemical Abstract Service (CAS No):** 27176-87-0.**Ingredients that contribute to the danger:** 5.0% free sulfuric acid (CAS No.: 7664-93-9).**4. - FIRST AID MEASURES****Inhalation:** Remove casualty to uncontaminated, ventilated area and administer oxygen, if available. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Quickly seek medical attention.**Skin contact:** Quickly remove contaminated clothing and shoes and wash the affected parts with plenty of running water for at least 15 minutes. Don't scrub the spot. Quickly seek medical attention.**Eye contact:** Washing 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 injured person can drink water or milk. If vomiting occurs spontaneously, the victim should be laid on their side to prevent pulmonary aspiration. Quickly seek medical attention.**Most important symptoms and effects, both acute and delayed:** It can cause redness, pain, skin dryness; burning, tearing and pain in the eyes; burning sensation, cough, shortness of breath and sore throat.**Notes to the physician:** If necessary, symptomatic treatment should include, above all, supportive measures such as correction of hydro electrolytic, metabolic disorders, as well as respiratory assistance.**5. - FIREFIGHTING MEASURES****Suitable extinguishing measures:** Carbon dioxide (CO₂), foam, water fog, dry chemical.**Not recommended:** Direct water jet.**Specific hazards of the mixture or substance:** Poisonous gases can be produced during burning, such as sulfur oxides and hydrogen sulfide.**Firefighting team protection measures:**

Self-contained positive pressure breathing apparatus and full protective clothing that provides protection from heat. Containers and tanks involved in the fire can be cooled with water mist.

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6. - CONTROL MEASURES FOR SPILLING OR LEAKING**Personal precautions, protective equipment and emergency procedures:**

Personnel who are not part of the emergency services: Do not breathe vapors or aerosols. Avoiding contact with the substance. Ensuring adequate ventilation. Evacuating the danger area, observe emergency procedures. If necessary, consult an expert.

For the staff of the emergency department: Use protective waterproof and resistant to chemicals clothing. Arrange the grounding of all equipment that will be used in the handling of the spilled product. Eliminate all possible ignition sources, such as, open flames, hot elements without isolation, electric or mechanical sparks, cigarettes, electrical circuits, etc. To prevent the use of any action or proceeding that results in the generation of sparks or flames.

Removal of ignition sources: Keep away from sources of heat and ignition.

Prevention of inhalation and contact with skin, mucous membranes and eyes: See Section 8, Field: "Appropriate Personal Protective Equipment".

Precautions to the environment: Isolate the area of the accident. To prevent the spread of the spilled product, avoiding the contamination of rivers and water springs. Seal the leak, if possible, to avoid contact with the skin and with the clothes. Never dispose the spilled material to sewage systems. Leaks must be reported to the manufacturer and/or the environmental agencies.

Methods and materials for containment and cleaning: Treat the area with a lime solution and wash with water hose jets. If large amounts of foam form, remove them with a silicone-based antifoam compound.

Disposal: Waste must be disposed of in accordance with current Environmental Legislation. Keep chemicals in their original containers. Do not mix with other waste. Handling dirty containers must be carried out in the same way as the product itself. An MSDS of the generated waste must be generated.

Differences in the action of large and small leaks: There is no differentiation.

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 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. Forms a slippery layer with water.

Storage:

Appropriate: Keep container tightly closed in a dry, cool and well-ventilated area. Keep in a cool, dry place in unopened original packaging. Avoid damp, wet and lightly wet conditions, temperature extremes and sources of ignition.

To avoid: Strong oxidizing agents.

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

Suitable conditions: Keep containers closed and in a well-ventilated place. Keep containers away from heat and direct sunlight. Avoid extreme temperatures. Avoid moisture.

Prevention of fire and explosion:

Keep away from heat, sparks, open flames and hot surfaces. Do not smoke.

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Suitable conditions: Store in a corrosion resistant container or with a strong inner liner. Keep only in the original container.

Packaging materials:

Type 304 or AISI 316 stainless steel or in carbon steel tanks coated with antacid resin reinforced with fiberglass. Do not use as packaging: Carbon steel or aluminum. Do not use as packaging: Carbon steel or aluminum.

8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters. Occupational exposure limits not established.

Biological indicators: Not established.

Other limits and values: Not established.

Measures of engineering control:

Provide mechanical ventilation and direct exhaust system to the outside environment. These measures help to reduce exposure to the product. It is recommended to make emergency showers and eye washes available in the work area.

Individual protection measures

Protection for the eyes/face: Eye protection (wide-vision safety glasses), which must be impact resistant and provide splash protection.

Protection of the skin and body: PVC or neoprene apron, including safety shoes. Protective gloves made of natural rubber, nitrile, latex or any other available material.

Respiratory protection: Protective mask with filter against vapors and mists. Thermal hazards: Does not present.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Aspect (physical state, shape and color): Amber viscous liquid.

Odor and Odor Threshold: Sulphur.

pH: Not available.

Melting point / freezing point: -10 °C.

Initial boiling point and boiling temperature range: 315 °C

Flash point: 200 °C (closed vessel).

Evaporation rate: Not available.

Flammability (solid, gas): Not applicable.

Lower/upper flammability or explosiveness limit: Not available.

Vapor pressure: 0,5 mmHg 20 °C.

Vapor Density: 11.0 (air = 1).

Relative Density: 1.04 -1.05 a 20 °C.

Solubility: Soluble in water. Miscible in aromatic and aliphatic hydrocarbons, ketones and ethanol.

n-octanol/water partition coefficient: log Kow: 4.780.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not Available

Further information: Average molecular weight 321 g/mol. Hygroscopic.

10. - STABILITY AND REACTIVITY

Stability and reactivity: Stable under normal conditions of temperature and pressure.

Possibility of hazardous reactions:

Reacts with bases and generates heat and explosion with strong oxidizing agents. In contact with strong acids (sulfuric, nitric and hydrochloric acid) emits highly toxic sulfur oxides.

Contact with metals can release flammable hydrogen gas.

Conditions to avoid:

High temperatures. Contact with incompatible materials.

Incompatible materials: Strong acids, oxidizing agents, strong oxidizing agents, aluminum, strong bases and metals.

Hazardous decomposition products

No hazardous decomposition products known.

11. - TOXICOLOGICAL INFORMATION

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Acute toxicity: Harmful if swallowed.

LD₅₀ (oral, rat): 1000 - 2000 mg/kg body weight.

Skin corrosion/irritation: Causes skin irritation with redness, pain, skin dryness.

A study in animals according to OECD 404 and with GLP (Good Laboratory Practices) showed that the substance is irritating to the skin.

Serious eye damage/eye irritation:

Causes serious eye damage with burning, tearing and eye pain.

Animal testing per OECD 405 and GLP (Good Laboratory Practice) has shown that the substance is irritating and poses a serious risk of eye damage.

Respiratory or skin sensitization:

The product is not expected to show skin sensitization.

The product is not expected to present respiratory sensitization.

Germ cell mutagenicity:

The product is not expected to show germ cell mutagenicity.

Carcinogenicity: The product is not expected to be carcinogenic.

Reproductive toxicity: Not classified for reproductive toxicity.

In an in vitro assay using fertilized frog eggs, sodium dodecylbenzenesulfonate at a concentration of 50 ppm resulted in inhibition of cell division in all conceptuses.

This exposure is unlikely to be relevant to common human exposure to these detergents.

Specific target organ toxicity - single exposure:

May cause irritation of the respiratory tract if inhaled and may cause a burning sensation, coughing, shortness of breath and sore throat.

Information regarding fuming sulfuric acid:

Ingestion causes severe burns to the mucous membranes of the mouth, throat, esophagus and stomach.

Digestive perforations, nausea and vomiting (sometimes with blood), diarrhea, profound thirst, respiratory collapse with wetting of the skin, weak and rapid pulse, labored breathing, scanty urine. Respiratory shock can cause death. Exposure to acid vapors causes immediate irritation to the mucous membranes (nose, throat, eyes), difficulty breathing.

Specific target organ toxicity - repeated exposure:

The product is not expected to present specific target organ toxicity – repeated exposure.

Information regarding fuming sulfuric acid:

Frequent skin contact with diluted solutions may cause dermatitis. Chronic exposure may also be associated with changes in lung function, chronic bronchitis, gastritis, stomatitis, erosion of tooth enamel, conjunctivitis, increased frequency of infection and cancer of the respiratory tract.

Aspiration hazard: The product is not expected to present an aspiration hazard.

Other toxicological information:

After a single oral dose of (35)S-demarcated sodium dodecylbenzenesulfonate in rats, the substance was excreted 64% in the urine and 24% in the faeces. A similar study of repeated doses of C-demarcated(14)alkyl benzenesulfonate (average molecular weight 349, a major constituent of detergents) in rhesus monkeys showed that radioactivity does not accumulate in tissues.

12. - ECOLOGICAL INFORMATION

Ecotoxicity: Toxic to aquatic organisms.

CE_{r50} (green algae, 96h): 29 mg/L.

LC₅₀ (Brachydanio rerio, 96h): 3.5 -10 mg/L.

CE₅₀ (Daphnia magna, 48h): 5.88 mg/L.

Persistence to degradability:

The product does not show persistence and is considered to be rapidly degradable.

A test with 76 mg/L of the substance in industrial activated sludge showed a degradation of 92% after 90 hours, with degradation products (identified by GLC and GC-MS spectroscopy) as 1-tetralone, 1-indanones, 4-methyl-1-tetralone and naphthalene's.

Bioaccumulative potential: The product is expected to have bioaccumulative potential. Kow log: 4.780.

Mobility in soil: Not determined.

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Other adverse effects: Large spills can acidify micro watersheds and tributaries in a timely manner. They can cause damage to the environment, burns to plants and living beings in general in the first layer of earth. If not removed or neutralized, it can deepen the effect.

13. - CONSIDERATIONS ABOUT THE 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.

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**National and International Regulations****Land:**

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: 2584.

Appropriate name for shipment: ALKYL SULFONIC ACIDS, LIQUID or ALKYL SULFONIC ACIDS, LIQUID, with more than 5% free sulfuric acid.

Risk class: 8.

Subsidiary Risk: NA.

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: 2584.

Appropriate name for shipment: ALKYL SULFONIC ACIDS, LIQUID or ALKYL SULFONIC ACIDS, LIQUID, with more than 5% free sulfuric acid.

Risk class: 8.

Subsidiary Risk: NA.

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: 2584.



MATERIAL SAFETY DATA SHEET - MSDS

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Risk class: 8.

Subsidiary Risk: NA.

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.

Bibliographical References:

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MATERIAL SAFETY DATA SHEET - MSDS

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1. - PRODUCT AND COMPANY IDENTIFICATION

Product name: SULFONIC ACID 90%

Internal Code of product identification: 107.23.1

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Address: Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.

Company Phone: + 5511 3821-7000 (PBX system) - + 5511 2481-3355.

Emergency phone: SUATRANS - COTEC - Environmental Emergency.

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193 – Firefighters.

Main recommended uses for the substance: Formulation of liquid, paste and powder detergents, thickeners, disinfectants (such as anionic surfactants), automotive shampoos, emulsifying agent for pesticides and asphalt manufacturing, textile and leather auxiliaries, degreasers when combined with organic solvent.

2. - HAZARD IDENTIFICATION

Classification of Substance

Exposure effects:

Corrosive to metals - Category 1.

Acute Toxicity - Oral - Category 4.

Acute toxicity - Dermal - Category 1.

Skin corrosion/irritation - Category 2.

Serious eye damage / eye irritation - Category 1.

Acute Toxicity - Inhalation - Category 1.

Toxicity to specific target organs - Single Exposure - Category 3.

Hazardous to the aquatic environment - Acute - Category 2.

Hazardous to the aquatic environment - Chronic - Category 2.

Emergency overview: Depending on the proportions, isolate and evacuate the area in case of leakage and/or spillage. Try to block the leak, contain the spilled liquid or transfer the product. Keep the wind blowing at your back during emergency care. Access by people to contaminated areas should only be allowed if they are wearing specific clothing and adequate respiratory protection, with filters for acidic gases (or combined) or self-contained or air-induction masks.

GHS labeling classification, including precautionary statements:

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Hazard pictograms	
Warning words	DANGER
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	<ul style="list-style-type: none">- H335 May cause irritation to the respiratory tracts.- H401 Toxic to aquatic organisms.
Caution Phrases	<ul style="list-style-type: none">- P261 Avoid breathing dust/fume/gas/mist/vapors/spray.- P273 - Avoid to release in the environment.- P280 - Use protective gloves/protective clothing/eye protection/face protection.- P302 IN CASE OF SKIN CONTACT: Wash with plenty soap and water.- P304 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 IN CASE OF CONTACT WITH EYES: Rinse thoroughly with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing.- P390 Absorb spilled product to avoid material damage.- P406 Store in a corrosion resistant container with a strong inner liner.

Other hazards which do not result in classification: Unknown

3. - COMPOSITION AND INFORMATION ON THE INGREDIENTS

Substance: SULFONIC ACID 90%

Common chemical name or generic name: LINEAR SULFONIC ACID.

Synonym: Linear alkylbenzene sulfonic acid, mixed alkylbenzene sulfonic acid, lauryl benzene sulfonic acid, dodecylbenzenesulfonic acid.

Chemical Abstract Service (CAS No): 27176-87-0.

Ingredients that contribute to the danger: 5.0% free sulfuric acid (CAS No.: 7664-93-9).

4. - FIRST AID MEASURES

Inhalation: Remove casualty to uncontaminated, ventilated area and administer oxygen, if available. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Quickly seek medical attention.

Skin contact: Quickly remove contaminated clothing and shoes and wash the affected parts with plenty of running water for at least 15 minutes. Don't scrub the spot. Quickly seek medical attention.

Eye contact: Washing 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 injured person can drink water or milk. If vomiting occurs spontaneously, the victim should be laid on their side to prevent pulmonary aspiration. Quickly seek medical attention.

Most important symptoms and effects, both acute and delayed: It can cause redness, pain, skin dryness; burning, tearing and pain in the eyes; burning sensation, cough, shortness of breath and sore throat.

Notes to the physician: If necessary, symptomatic treatment should include, above all, supportive measures such as correction of hydro electrolytic, metabolic disorders, as well as respiratory assistance.

5. - FIREFIGHTING MEASURES

Suitable extinguishing measures: Carbon dioxide (CO₂), foam, water fog, dry chemical.

Not recommended: Direct water jet.

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Containers and tanks involved in the fire can be cooled with water mist.

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substances. Ensuring adequate ventilation. Evacuating the danger area, observe emergency procedures. If necessary, consult an expert.

For the staff of the emergency department: Use protective waterproof and resistant to chemicals clothing. Arrange the grounding of all equipment that will be used in the handling of the spilled product. Eliminate all possible ignition sources, such as, open flames, hot elements without isolation, electric or mechanical sparks, cigarettes, electrical circuits, etc. To prevent the use of any action or proceeding that results in the generation of sparks or flames.

Removal of ignition sources: Keep away from sources of heat and ignition.

Prevention of inhalation and contact with skin, mucous membranes and eyes: See Section 8, Field:

“ Appropriate Personal Protective Equipment”.

Precautions to the environment: Isolate the area of the accident. To prevent the spread of the spilled product, avoiding the contamination of rivers and water springs. Seal the leak, if possible, to avoid contact with the skin and with the clothes. Never dispose the spilled material to sewage systems. Leaks must be reported to the manufacturer and/or the environmental agencies.

Methods and materials for containment and cleaning: Treat the area with a lime solution and wash with water hose jets. If large amounts of foam form, remove them with a silicone-based antifoam compound.

Disposal: Waste must be disposed of in accordance with current Environmental Legislation. Keep chemicals in their original containers. Do not mix with other waste. Handling dirty containers must be carried out in the same way as the product itself. An MSDS of the generated waste must be generated.

Differences in the action of large and small leaks: There is no differentiation.

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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 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. Forms a slippery layer with water.

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Appropriate: Keep container tightly closed in a dry, cool and well-ventilated area. Keep in a cool, dry place in unopened original packaging. Avoid damp, wet and lightly wet conditions, temperature extremes and sources of ignition.

To avoid: Strong oxidizing agents.

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

Suitable conditions: Keep containers closed and in a well-ventilated place. Keep containers away from heat and direct sunlight. Avoid extreme temperatures. Avoid moisture.

Prevention of fire and explosion:

Keep away from heat, sparks, open flames and hot surfaces. Do not smoke.

Suitable conditions: Store in a corrosion resistant container or with a strong inner liner. Keep only in the original container.

Packaging materials:

Type 304 or AISI 316 stainless steel or in carbon steel tanks coated with antacid resin reinforced with fiberglass.

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Do not use as packaging: Carbon steel or aluminum. Do not use as packaging: Carbon steel or aluminum.

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Biological indicators: Not established.

Other limits and values: Not established.

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Provide mechanical ventilation and direct exhaust system to the outside environment. These measures help to reduce exposure to the product. It is recommended to make emergency showers and eye washes available in the work area.

Individual protection measures

Protection for the eyes/face: Eye protection (wide-vision safety glasses), which must be impact resistant and provide splash protection.

Protection of the skin and body:

PVC or neoprene apron, including safety shoes. Protective gloves made of natural rubber, nitrile, latex or any other available material.

Respiratory protection: Protective mask with filter against vapors and mists.

Thermal hazards: Does not present.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Aspect (physical state, shape and color): Amber viscous liquid.

Odor and Odor Threshold: Sulphur.

pH: Not available.

Melting point / freezing point: -10 °C.

Initial boiling point and boiling temperature range: 315 °C.

Flash point: 200 °C (closed vessel).

Evaporation rate: Not available.

Flammability (solid, gas): Not applicable.

Lower/upper flammability or explosiveness limit: Not available.

Vapor pressure: 0,5 mmHg 20 °C.

Vapor Density: 11.0 (air = 1).

Relative Density: 1.04 -1.05 a 20 °C.

Solubility: Soluble in water. Miscible in aromatic and aliphatic hydrocarbons, ketones and ethanol.

n-octanol/water partition coefficient: log Kow: 4.780.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not Available

Further information: Average molecular weight 321 g/mol. Hygroscopic.

10. - STABILITY AND REACTIVITY

Stability and reactivity: Stable under normal conditions of temperature and pressure.

Possibility of hazardous reactions:

Reacts with bases and generates heat and explosion with strong oxidizing agents. In contact with strong acids (sulfuric, nitric and hydrochloric acid) emits highly toxic sulfur oxides.

Contact with metals can release flammable hydrogen gas.

Conditions to avoid:

High temperatures. Contact with incompatible materials.

Incompatible materials: Strong acids, oxidizing agents, strong oxidizing agents, aluminum, strong bases and metals.

Hazardous decomposition products

No hazardous decomposition products known.

11. - TOXICOLOGICAL INFORMATION

Acute toxicity: Harmful if swallowed.

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LD₅₀ (oral, rat): 1000 - 2000 mg/kg body weight.

Skin corrosion/irritation: Causes skin irritation with redness, pain, skin dryness.

A study in animals according to OECD 404 and with GLP (Good Laboratory Practices) showed that the substance is irritating to the skin.

Severe ocular lesions/eye irritation:

Causes serious eye damage with burning, tearing and eye pain.

Animal testing per OECD 405 and GLP (Good Laboratory Practice) has shown that the substance is irritating and poses a serious risk of eye damage.

Respiratory or skin sensitization:

The product is not expected to show skin sensitization.

The product is not expected to present respiratory sensitization.

Germ cell mutagenicity:

The product is not expected to show germ cell mutagenicity.

Carcinogenicity: The product is not expected to be carcinogenic.

Reproductive toxicity: Not classified for reproductive toxicity.

In an in vitro assay using fertilized frog eggs, sodium dodecylbenzenesulfonate at a concentration of 50 ppm resulted in inhibition of cell division in all conceptuses.

This exposure is unlikely to be relevant to common human exposure to these detergents.

Specific target organ toxicity - single exposure:

May cause irritation of the respiratory tract if inhaled and may cause a burning sensation, coughing, shortness of breath and sore throat.

Information regarding fuming sulfuric acid:

Ingestion causes severe burns to the mucous membranes of the mouth, throat, esophagus and stomach.

Digestive perforations, nausea and vomiting (sometimes with blood), diarrhea, profound thirst, respiratory collapse with wetting of the skin, weak and rapid pulse, labored breathing, scanty urine. Respiratory shock can cause death. Exposure to acid vapors causes immediate irritation to the mucous membranes (nose, throat, eyes), difficulty breathing.

Specific target organ toxicity - repeated exposure:

The product is not expected to present specific target organ toxicity – repeated exposure.

Information regarding fuming sulfuric acid:

Frequent skin contact with diluted solutions may cause dermatitis. Chronic exposure may also be associated with changes in lung function, chronic bronchitis, gastritis, stomatitis, erosion of tooth enamel, conjunctivitis, increased frequency of infection and cancer of the respiratory tract.

Aspiration hazard: The product is not expected to present an aspiration hazard.

Other toxicological information:

After a single oral dose of (35)S-demarcated sodium dodecylbenzenesulfonate in rats, the substance was excreted 64% in the urine and 24% in the faeces. A similar study of repeated doses of C-demarcated(14) alkylbenzene sulfonate (average molecular weight 349, a major constituent of detergents) in rhesus monkeys showed that radioactivity does not accumulate in tissues.

12. - ECOLOGICAL INFORMATION

Ecotoxicity: Toxic to aquatic organisms.

ECr₅₀ (green algae, 96h): 29 mg/L.

LC₅₀ (Brachydanio rerio, 96h): 3.5 -10 mg/L.

EC₅₀ (Daphnia magna, 48h): 5.88 mg/L.

Persistence to degradability:

The product does not show persistence and is considered to be rapidly degradable.

A test with 76 mg/L of the substance in industrial activated sludge showed a degradation of 92% after 90 hours, with degradation products (identified by GLC and GC-MS spectroscopy) as 1-tetralone, 1-indanones, 4-methyl-1-tetralone and naphthalene's.

Bioaccumulative potential: The product is expected to have bioaccumulative potential. Kow log: 4.780.

Mobility in soil: Not determined.

Other adverse effects: Large spills can acidify micro watersheds and tributaries in a timely

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manner. They can cause damage to the environment, burns to plants and living beings in general in the first layer of earth. If not removed or neutralized, it can deepen the effect.

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.

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**National and International Regulations****Land:**

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: 2586.

Appropriate name for shipment: ALKYL SULFONIC ACIDS, LIQUID or ALKYL SULFONIC ACIDS, LIQUID, with not more than 5% sulfuric acid

Risk class: 8.

Subsidiary Risk: NA.

Risk number: 80.

Packing group: III.

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: 2586.

Appropriate name for shipment: ALKYL SULFONIC ACIDS, LIQUID or ALKYL SULFONIC ACIDS, LIQUID, with not more than 5% sulfuric acid

Risk class: 8.

Subsidiary Risk: NA.

Risk number: 80.

Packing group: III.

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: 2586.



MATERIAL SAFETY DATA SHEET - MSDS

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Risk class: 8.

Subsidiary Risk: NA.

Risk number: 80.

Packing group: III.

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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