

Material Safety Data Sheet

SULFUR DIOXIDE (SO₂)

Section 1 - Product and Company Information

Substance	: Sulfurous oxide, Sulfurous anhydride.
Trade Name	: Sulfur dioxide gas
Company	: Shiva Pharmachem Ltd. Plot No. 588, Village Luna – 391440 Taluka Padra, District: Vadodara, Gujarat, India.
Phone No.	: +91-2662-221021 / 224360
Fax No.	: +91-2662-223314

Section 2 – Hazards Identification

2.1 Classification of the substances or mixture

Classification according to regulations (EC) no 1272 / 2008 (EU GHS/CLP)

Skin Corrosion, (Category 1B)
Gases under pressure (Liquefied gas)

Acute toxicity, inhalation (category 3)

Classification according to EU directives 67/548/EEC or 1999/45/EC

Toxic by inhalation, Causes burn

2.2 Labeling elements

Labeling according to EC 1272 / 2008 (CLP)

Pictogram



Single word

Danger

Hazard Elements

H280

Contains gas under pressure. May explode if heated.

H314

Causes severe skin burn and eye damage.

H331

Toxic if inhaled.

Precautionary statements

P261

Avoid breathing gas.

P280

Wear protective gloves/protective clothing/eye and face protection

P305 + P351 + P338 IF IN EYES: Rinse cautiously for several minutes.

P310 Immediately call physician

P410 + P403 Protect from sunlight. Store in well - ventilated place.

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According to EU directives 67/548/EEC as amended

Hazard symbol



R PHRASE (s)

R23

Toxic by inhalation.

R34

Causes burn.

S PHRASE (s)

S9

Keep container in well - ventilated place.

S26

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39

Wear suitable protective clothing, gloves and eye/face protection.

S45

In case of accident or you feel unwell, seek medical advice.

2.3 Other hazard

None.

Section 3 - Composition / Information on Ingredients

Product Name	CAS No.	EC No.	Mol. Formula	Mol. Wt.
Anhydrous Hydrogen Chloride	7446-09-5	231-195-2	SO ₂	64.06 g/mol

Exposure Limits

ACGIH TLV (United States, 1/2009).

STEL: 0.25 ppm , 15 minute (s)

OSHA PEL 1989 (United States, 3/1989).

TWA : 2 ppm , 8 hr (s)

TWA : 5 mg / m³ 8 hr (s)

STEL: 5 ppm , 15 minute (s)

STEL: 10 mg/m³ , 15 minute (s)

NIOSH REL (United States, 6/2009).

TWA: 2 ppm , 10 hr (s)

TWA: 5 mg / m³ 10 hr (s)

STEL: 5 ppm , 15 minute (s)

STEL: 13 mg/m³ , 15 minute (s)

OSHA PEL (United States, 11/2006).

TWA : 5 ppm , 8 hr (s)

TWA : 13 mg / m³ 8 hr (s)

NIOSH

IDLH: 100 ppm

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Section 4 – First Aid Measures

First aid measure

4.1 Description of first aid measure.

General advice: Consult physician. Show this data sheet to the attendant.

Eye contact: Flush the eyes with plenty of water immediately for a minimum 15 minutes. Seek Immediate medical attention. Persons working in the area of use should avoid wearing contact lenses.

Skin contact: Remove contaminated clothing and Shoes. Simultaneously wash skin with soap and water for a minimum of 15 Minutes. Seek medical attention.

Inhalation: Take affected person immediately to Fresh air in case of any adverse effect, provide Oxygen if breathing is difficult. Seek medical attention immediately.

Ingestion: Give plenty of water or milk. Never administer fluid to unconscious person or allow vomiting. If person is unconscious turn head to side. Seek Immediate medical attention. If person is conscious, allow vomiting to occur. When vomiting occurs, keep head below than his hips to prevent aspiration.

Frostbite: Try to warm up the frozen tissues and seek medical attention.

4.2 Most important symptoms and effect, both acute and delayed.

Material is extremely destructive to tissues of the mucous membrane and upper respiratory tract, eye and skin, bronchoconstriction, pulmonary edema

Note to Physician: Bronchospasm may be treated with the use of bronchodilator such as albuterol and an anticholinergic inhalant such as atrovent.

Section 5 – Fire Fighting Measures

Fire and Explosion Hazards: Non-flammable. Reacts with water in a corrosive manner to liberate Hydrogen gas. Also reacts with many organic chemicals with liberation of heat. Exposure of the Containers to heat should be avoided.

Extinguishing Media: Use water spray, alcohol resistant foam, carbon dioxide and Dry Chemical.

Large fires: Use regular foam or use sprinkler for water Spray.

Fire fighting: Wear appropriate protective equipment and self-contained breathing (SCBA). Avoid water ingress. If possible, remove container to safer area and cool with water spray. Stay away from container.

Section 6 – Accidental Release Measures

Air Release: Use sprinkler for water spray to reduce vapors. Keep out of low areas.

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Collect contaminated water and dispose as per Federal rules.

Soil Release: Use lime or limestone to neutralize the released Acid. Prepare Dykes to avoid Spreading of the released acid.

Water Release: Use alkaline material such as lime or limestone to neutralize released spill.

Occupational Release:

Stop leakage, if possible, without personal risk. Divert the SO₂ release to the Scrubber / Absorber System through Vacuum Hoses wherever is Possible. Blanket the vapors with water spray do not spray water directly on the damaged part or point of release. Do not allow water to go inside the Container. Small spills should be controlled by flooding with water and large spills should be controlled in a Dyke, to be neutralized and disposed off safely as per local federal rules. Train operators for prevention and emergency control. Person should wear Self-contained breathing apparatus and take all safety precautions while handling the emergency.

Section 7 - Handling and Storage

Store and handle in accordance with all Current Regulations and Standards. Protect from physical damage. Store in a cool and dry place and avoid exposure from direct sunlight and source of heat. Store in well-ventilated, cool and dry area of non-combustible construction. Keep separately and away from incompatible substances.

The Temperature at the Storage area should never be allowed to exceed 50 - 52 °C.

Cylinders must be stored upright and firmly secured with chain to prevent falling or being knocked over. Full and empty Cylinders should be segregated. Use a FIFO inventory system to prevent full cylinders from being stored for excessive periods of time. Do not drag, slide or roll Cylinders. Use a suitable hand truck for cylinder movement. Use a specified and approved pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat Cylinder by any means to increase the discharge rate of Product from the Cylinder.

Avoid breathing and contact of vapor or liquid in eyes, skin or on clothing. Safety Showers and eyewash fountains shall be maintained properly and made immediately available. Ensure that piping and equipments are designed to withstand pressure to be encountered. Tightly close cylinder valve after use. Keep it closed even cylinder is empty. To prevent reverse flow, use a check Valve or other protective device in any line or piping from the cylinder. Reverse flow in cylinder may cause rupture. If there is a leak, close the cylinder valve. Blow the System down in a safe and environmentally sound manner in compliance with statutory regulations then repair the leak. Follow safe practices when returning the cylinders to supplier. Be sure valve is closed; then tightly install valve outlet plug and cap.

Lime Stone and enough water should be available during transport. Leaking Cylinder should be taken to an isolated place. Initially the leak will be more and will rapidly become less due to cooling of the Cylinder. The area should be sprayed with water and neutralized with Lime Stone. Universal pH indicator paper should be used for checking the pH of the water on the ground.

Keep unnecessary people away, isolate hazard area and deny entry. Always stay upwind and keep out of low areas.

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Section 8 - Exposure Controls / Personal Protection

Ventilation:

Provide a local exhaust or process enclosure Ventilation System. Ensure compliance with applicable Exposure Limits.

Eye protection:

Wear Splash Resistant Safety goggles with a Face Shield. Provide an emergency Eye-wash fountain and Quick Drench Shower in the immediate work area.

Skin protection:

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory:

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands: Wear Appropriate Chemical resistant Hand Gloves

Personal protection Clothing:

Wear appropriate Chemical resistant Cloth. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

Section 9 - Physical and Chemical Properties

Physical state	:	Gas
Color	:	Colorless
Odor	:	Irritating pungent odor
Molecular Weight	:	64.06 g / mole
Molecular Formula	:	SO ₂
Boiling Point	:	- 10°C
Freezing Point	:	- 72 °C
Critical Temperature	:	156.9 °C
Vapor Pressure	:	34 psig ; 237.2 kPa
Vapor Density (Air=1)	:	2.2
Specific Gravity (Water=1)	:	1.187 @ (-) 85°C
Specific Volume (ft 3/lb)	:	5.9172
Gas Density (lb/ft 3)	:	0.169
pH	:	Acidic in solution
Acidity	:	
pKa	:	1.81
pKb	:	12.19
Viscosity	:	0.403 cp (at 0 °C)

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Section 10 - Stability and Reactivity

Stability and Reactivity: The product is stable.

Conditions to avoid : Direct contact of the cylinder with heat and its sources.

Incompatibilities : Cast iron, Zinc, Brass, Galvanized Iron, Aluminium, Copper, Copper Alloys, Amines, Bases, Metal Carbides. Oxidizing Materials.

Hazardous Decomposition product: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Polymerization : Does not Polymerize.

Section 11 - Toxicological Information

Carcinogen Status : Inadequate evidence for Humans and Animals.

Local Effects (Corrosive) : Inhalation, Eye, Skin and Ingestion.

Toxicity Data : LC 50 2520 ppm1 hr (Rat)

Section 12 - Ecological Information

Aquatic toxicity:

Sulfur dioxide is not listed as marine pollutant by DOT (49 CFR 171)

Environmental fate: Data Not available.

Environmental hazards: Significant effects or critical hazards are not known.

Toxicity to the environment: Data Not available.

Remarks: Do not release large amount of this product to the atmosphere. It does not contain class I or class II ozone depleting chemicals.

Section 13 – Disposal Consideration

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State; local regulation. Return cylinders with residual product to Shiva Pharmachem Ltd .Do not dispose off locally.

Section 14 - Transport Information

Transporting Name	:	Sulfur Dioxide gas
ID Number	:	UN 1079
Hazard Class or Division	:	2.3
Labeling requirements	:	2.3 (Poison Gas), 8 (Corrosive)
Additional shipping Description	:	As per specific requirements

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

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Section 15 - Regulatory Information

U.S. Federal regulations:

United States inventory (TSCA 8b): This material is listed or exempted.
SARA 302/304/311/312 extremely hazardous substances: Sulfur dioxide
SARA 302/304 emergency planning and notification: Sulfur dioxide
SARA 302/304/311/312 hazardous chemicals: Sulfur dioxide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
 Sulfur dioxide: Sudden release of pressure, immediate (acute) health hazard,
 Delayed (chronic) health hazard

Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: Sulfur dioxide
Connecticut Carcinogen Reporting: This material is not listed.

Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.

Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is listed.
New York Acutely Hazardous Substances: This material is listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.
Rhode Island Hazardous Substances: This material is not listed.

State regulations

WHMIS (Canada) Class A: Compressed gas.
 Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
 Class E: Corrosive material

CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

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Section 16- Additional Information

United States

Label requirements: CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. CONTENTS UNDER PRESSURE.

Always secure Cylinders in an upright position before transporting them. Never transport Cylinders in trunks of vehicles, enclosed vans, and truck cabs or in passenger compartments. Transport Cylinders secured in flat bed or in open pick-up type vehicles.

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