

Material Safety Data Sheet

Material Name: Sulfur Dioxide

MSDS ID: Hynote-0042

Section 1 - Product and Company Identification

Synonyms: Bisulfite, Sulfurous Anhydride, Sulfurous Oxide, Sulfur Oxide

Chemical Name: Sulfur Dioxide

Formula: SO₂

TDG (Canada) CLASSIFICATION: 2.3 (8)

WHMIS CLASSIFICATION: A, D1A, D2B, E

ShangHai Hynote

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EMERGENCY Telephone Numbers:

+86-21-58790001 (In South China):
+86-379-65867058 (In North China)
+86-10-110/119/120 (24 Hours)

Product Information: +86-379-65867058

MSDS Information Email: hynote@shtel.net.cn

Section 2 - Composition/information on ingredients

COMPOSITION: 99.9%

PEL-OSHA¹: 5 ppm TWA

CAS NUMBER: 7446-09-5

TLV-ACGIH₂: 2 ppm TWA, 5 ppm STEL

RTECS#: WS4550000

LD₅₀ or LC₅₀ Route/Species: LC₅₀ 2520 ppm/1H (rat)

Formula: SO₂

¹ As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993).

² As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Corrosive to exposed tissues. Inhalation of vapors may result in pulmonary edema and chemical pneumonitis. Nonflammable. Reacts with water to produce sulfuric acid.

ROUTE OF ENTRY:

| Skin Contact | Skin Absorption | Eye Contact | Inhalation | Ingestion |
|--------------|-----------------|-------------|------------|-----------|
| Yes | No | Yes | Yes | No |



HEALTH EFFECTS:

| | | |
|--------------------------------------|----------------------------|---------------------|
| Exposure Limits Yes | Irritant Yes | Sensitization No |
| Teratogen Yes | Reproductive Hazard Yes | Mutagen Yes |
| Synergistic Effects None Reported | | |

Carcinogenicity:

NTP:No IARC: No OSHA: No

EYE EFFECTS:

Corrosive and irritating to the eyes. Contact with the liquid or vapor causes painful burns and ulcerations.

Burns to the eyes result in lesions and possible loss of vision.

SKIN EFFECTS:

Corrosive and irritating to the skin and all living tissue. Toxic level exposure to dermal tissue causes acid-like burns and skin lesions resulting in early necrosis and scarring.

INGESTION EFFECTS:

Ingestion unlikely. Gas at room temperature.

INHALATION EFFECTS:

Corrosive and irritating to the upper and lower respiratory tract and all mucosal tissue. Initial symptoms of exposure include nose and throat irritation, becoming steadily worse, suffocating and painful. The irritation extends to the chest causing a cough reflex which may be violent and painful and may include the discharge of blood or vomiting with eventual collapse. Other symptoms include headache, general discomfort and anxiety. Chemical pneumonitis and pulmonary edema may result from exposure to the lower respiratory tract and deep lung.

Repeated or prolonged low level exposures may cause corrosion of the teeth.

Reproductive toxicity and developmental changes in newborn have been observed in experimental animals exposed to sulfur dioxide.

Sulfur dioxide is mutagenic in experimental cell assay systems.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Individuals with impaired pulmonary function may be at increased risk from exposure.

NFPA HAZARD CODES

Health: 3
Flammability: 0
Reactivity: 0

HMIS HAZARD CODES

Health: 3
Flammability: 0
Reactivity: 1

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

Section 4- First Aid Measures

EYES:

PERSONS WITH POTENTIAL EXPOSURE SHOULD NOT WEAR CONTACT LENSES.
 Flush contaminated eyes with copious quantities of water. Part eyelids to assure complete flushing.
 Continue for a minimum of 15 minutes. Seek immediate medical attention.

SKIN:

Remove contaminated clothing as rapidly as possible. Flush affected area with copious quantities of water. Seek immediate medical attention.

INGESTION:

Not required.

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVER EXPOSURE.
 RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Section 5- Fire-Fighting Measures

| | | |
|--|------------------------|--------------------------------|
| Conditions of Flammability: Nonflammable | | |
| Flash point: None | Method: Not Applicable | Autoignition Temperature: None |
| LEL(%): None | UEL(%):None | |
| Hazardous combustion products: None | | |
| Sensitivity to mechanical shock: None | | |
| Sensitivity to static discharge: None | | |

FIRE AND EXPLOSION HAZARDS:

None. Nonflammable.

EXTINGUISHING MEDIA:

Use media appropriate for surrounding materials. Sulfur dioxide forms sulfuric acid solutions with water.

Section 6- Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Hynote location.

Section 7- Handling and Storage

Electrical classification:

Nonhazardous.

Most metals corrode when in contact with wet sulfur dioxide.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<150 psig) piping or systems. Do not heat cylinder by any means to increase rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent Hazardous back flow into cylinder.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated areas of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130oF (54oC). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full & empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1 and G-3.

Section 8- Exposure Controls/Personal Protection

EXPOSURE LIMITS¹:

| INGREDIENT | %VOLUME | PEL-OSHA ² | TLV-ACGIH ³ | LD ₅₀ or LC ₅₀ Route/Species |
|---|---------|-----------------------|-------------------------|---|
| Sulfur Dioxide Formula: SO ₂ CAS: 7446-09-5 RTECS#: WS4550000 | 99.9 | 5 ppm TWA | 2 ppm TWA 5 ppm STEL | LC ₅₀ 2520 ppm/1H (rat) |

¹ Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.

² As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

³ As stated in the ACGIH 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

IDLH: 100 ppm

ENGINEERING CONTROLS:

Hood with forced ventilation. Use local ventilation to prevent accumulation above the exposure limit.

EYE/FACE PROTECTION:

Full-face piece respirator or gas-tight goggles recommended.

SKIN PROTECTION:

Plastic or rubber.

RESPIRATORY PROTECTION:

Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION:

Safety shoes, safety shower, eyewash "fountain", face shield.

Section 9- Physical and Chemical Properties

| PARAMETER | VALUE | UNITS |
|-------------------------------------|---|--------------|
| Physical state (gas, liquid, solid) | : Gas | |
| Vapor pressure | : 49.1 | psia |
| Vapor density (Air = 1) | : 2.26 | |
| Evaporation point | : Not Available | |
| Boiling point | : -14.0 | °F |
| | : -10.0 | °C |
| Freezing point | : -103.9 | °F |
| | : -75.5 | °C |
| pH | : Not Applicable | |
| Specific gravity | : 2.26 | |
| Oil/water partition coefficient | : Not Available | |
| Solubility (H ₂ O) | : Soluble | |
| Odor threshold | : Not Applicable | |
| Odor and appearance | : Colorless vapor with a highly irritating, pungent odor. | |

Section 10- Stability and Reactivity
STABILITY:

Stable.

INCOMPATIBLE MATERIALS

Reacts violently with peroxides, chromates, bichromates, permanganates and oxygen difluoride. It also reacts with chlorates to form chlorine, which may become explosive at elevated temperatures. Forms sulfuric acid solutions with water.

HAZARDOUS POLYMERIZATION:

Does not occur.

Section 11- Toxicological Information
REPRODUCTIVE:

Experimental inhalation exposures of rats and mice at 1.5 to 32 ppm resulted in toxicity to both the male and female reproductive systems. Effects included menstrual cycle changes and toxic

effects to testes.

Developmental abnormalities were observed in newborn of exposed pregnant animals.

MUTAGENIC:

Genetic changes observed in mammalian, insect bacterial and yeast cell assay systems.

TUMORIGENIC:

Experimental data for increased incidence of tumors in the respiratory systems of mice.

OTHER:

Changes observed in the red blood cells of exposed rats. Functional changes in the respiratory systems of exposed dogs.

Section 12- Ecological Information

No data given.

Section 13- Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to HYNOTE or authorized distributor for proper disposal.

Section 14- Transport Information

DOT/IMO SHIPPING NAME: Sulfur Dioxide

HAZARD CLASS: 2.3

IDENTIFICATION NUMBER: UN 1079

PRODUCT RQ: None

SHIPPING LABEL(s): POISON GAS, CORROSIVE

PLACARD (when required): POISON GAS, CORROSIVE

Section 15- Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

Sulfur dioxide is listed as an extremely hazardous substance (EHS) subject to state and local reporting under

Section 304 of SARA Title III (EPCRA) with a reportable quantity (RQ) of 1 pound.

The presence of sulfur dioxide in quantities in excess of the threshold planning quantity (TPQ) of 500 pounds requires certain emergency planning activities to be conducted.

SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard

Chronic Health Hazard

Sudden Release of Pressure Hazard

Reactivity Hazard



Section 16- Other Information

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

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