

MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
Gaithersburg, Maryland 20899

SRM Number: 1662a
MSDS Number: 1662a
SRM Name: Sulfur Dioxide in Nitrogen
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MSDS Coordinator: Joylene W.L. Thomas
Phone: (301) 975-6776
ChemTrec: 1-800-424-9300

FAX: (301) 926-4751
e-mail: SRMMSDS@nist.gov

SECTION I. MATERIAL IDENTIFICATION

Material Name: Sulfur Dioxide in Nitrogen

Description: SRM 1662a is supplied in a DOT 3AL specification aluminum (6061 alloy) cylinder with a water volume of 6 L. Mixtures are shipped with a nominal pressure exceeding 12.4 MPa (1800 psi) which provides the user with 0.73 m³ (25.8 ft³) of useable mixture. The cylinder conforms to DOT specifications and is equipped with a CGA-660 stainless steel valve.

Other Designations: Sulfur Dioxide (sulfur dioxide anhydrous; sulfurous acid anhydride; sulfur dioxide; sulfur oxide; fermenticide liquid)

| Name | Chemical Formula | CAS Registry Number |
|----------------|------------------|---------------------|
| Sulfur dioxide | SO ₂ | 7446-09-5 |
| Nitrogen | N ₂ | 7727-37-9 |

DOT Classification: Nonflammable Gas, UN1956

Manufacturer/Supplier: Available from a number of suppliers

SECTION II. HAZARDOUS INGREDIENTS

| Hazardous Components | Nominal Concentration | Limits and Toxicity Data |
|----------------------|-----------------------|---|
| Sulfur Dioxide | 1000 µmol/mol | ACGIH TLV: 2 mg/kg OSHA TLV-TWA (PEL): 5 mg/kg or 12 mg/m ³ |
| Nitrogen | Balance | Simple Asphyxiant |

SECTION III. PHYSICAL/ CHEMICAL CHARACTERISTICS

| Sulfur Dioxide in Nitrogen |
|---|
| Appearance: Colorless |
| Odor: Irritating pungent odor |
| Physical State: Gas |
| Vapor Pressure: Not applicable |
| Vapor Density (Air = 1): 0.967 - 0.980 |
| Boiling Point: Not applicable |
| Solubility in Water: 1.485 cm ³ /100 m ³ |
| Specific Gravity (H₂O = 1): Gas |
| Evaporation Rate: Gas |
| Odor Threshold: (0.33 - 5) mg/kg (SO ₂) |

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Nonflammable

Autoignition Temperature: Not applicable

Flammability Limits in Air (Volume %): **UPPER:** Not applicable
LOWER: Not applicable

Extinguishing Media: Use extinguishing media that is appropriate to the surrounding fire.

Hazardous Combustion Products: None

Special Fire Procedures: Fire fighters should wear full protective clothing and self-contained breathing apparatus when this material is involved in a fire. Keep fire cylinders cool with water spray. If possible, stop the product flow.

Unusual Fire and Explosion Hazards: Cylinders may rupture under fire conditions.

SECTION V. REACTIVITY DATA

Stability: X Stable Unstable

Conditions to Avoid: Take precaution to avoid exposing any part of a compressed gas cylinder to temperatures above 51.6 °C. Do not store this material in direct sunlight. This gas corrodes most metals in the presence of moisture.

Incompatibility (Materials to Avoid): Nitrogen reacts with lithium, niobium, and titanium at high temperatures.

See Section IV: *Fire and Explosion Hazard Data*

Hazardous Decomposition or Byproducts: Sulfur dioxide dissolves in water to form corrosive sulfuric acid.

Hazardous Polymerization: Will Occur X Will Not Occur

SECTION VI. HEALTH HAZARD DATA

Route of Entry: X Inhalation X Skin Ingestion

Corrosive, high pressure gas can cause rapid suffocation. May also cause eye, skin, and respiratory tract burns.

Acute Effects: The mixture can act as a simple asphyxiant by displacing air necessary for life. It is corrosive and irritating to the respiratory tract, skin, and eyes. Inhalation at high concentrations may be fatal due to spasm, inflammation and edema of the lungs, chemical pneumonitis, and pulmonary edema. Eye contact may result in irritation and inflammation of the conjunctiva and cornea and destruction of the eye tissue.

Chronic Effects: Not applicable

Medical Conditions Generally Aggravated by Exposure: Not applicable

Other Effects of Overexposure: Not applicable

Listed as a Carcinogen/Potential Carcinogen:

| | Yes | No |
|--|---------------|--------------|
| In the National Toxicology Program (NTP) Report on Carcinogens | <u> </u> | <u> X </u> |
| In the International Agency for Research on Cancer (IARC) Monographs | <u> </u> | <u> X </u> |
| By the Occupational Safety and Health Administration (OSHA) | <u> </u> | <u> X </u> |

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with copious amounts of water for at least 15 min. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 min. Obtain medical assistance if necessary.

Inhalation: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical assistance if necessary.

Ingestion: Not applicable

TARGET ORGAN(S) OF ATTACK: The eyes, skin, and upper respiratory tract.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material Is Released or Spilled: Notify safety personnel of a sulfur dioxide spill and/or leak. Small leaks can be detected by passing ammonia vapors over suspected leak areas; a dense white fume will form near the leak area. Stay upwind of the spill or leak and out of low-lying areas.

Waste Disposal: Try to prevent any direct release of sulfur dioxide to the atmosphere. When leaks cannot be stopped, discharge cylinders at a controlled rate into a large amount of water solution of 15 % NaOH or other alkali. Return cylinders to supplier with any valve outlet plugs or caps secured and valve protection cap in place. Dispose of non-refillable cylinders in accordance with federal, state, and local regulations.

Handling and Storage: Store in well ventilated areas. Secure cylinder at all times when using to protect from falling. Use adequate general and local exhaust ventilation to maintain concentrations below exposure limits and to avoid asphyxiation. In case of leakage, use self-contained breathing apparatus. Keep valve protection cap on cylinders when not in use.

Wear rubber or vinyl gloves and other resistant, protective clothing. Where danger of contact with liquid exists, rubber boots, a rubber suit, and face shield may be required. A chemical safety shower and an eyewash station must be readily available. Wear safety shoes when handling cylinders. Use suitable hand truck to move cylinders.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Keep cylinders of sulfur dioxide in a cool, dry, well ventilated area and protect cylinders from physical damage. Keep containers out of direct sunlight and away from sources of heat.

SECTION VIII. SOURCE DATA/ OTHER COMMENTS

Source: Scott Specialty Gases, MSDS *Sulfur Dioxide in Nitrogen*, 3 May 2000.

Disclaimer: Physical and chemical data contained in this MSDS are provided for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified values for this material are given only on the NIST Certificate of Analysis.