MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1804c
MSDS Number: 1804c
SRM Name: Toxic Volatile Organic Compounds in Nitrogen

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Description: This SRM is a primary gas mixture of thirty volatile organic compounds in nitrogen provided as a compressed gas in a DOT 3AL specification aluminum (6061alloy) cylinder equipped with a CGA-350 brass valve with a nominal pressure exceeding 12.4 MPa (1800 psig). The cylinder with a water volume of 6 L provides the user with 0.73 m^3 of useable mixture. NIST recommends that this cylinder **NOT** be used below 2.8 MPa (400 psig).

Substance: Nitrogen Compressed Gas Mixture.

Other Designations: **Nitrogen** (dinitrogen) compressed gas mixture.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Concentration
Nitrogen	7727-37-9	231-783-9	> 99.9 % [(a)]

[(a)] Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200

Note: SRM 1804c contains trace amounts of 30 different volatile organic compounds (5.0 nmol/mol [ppb] of each), many of which have toxic, mutagenic and/or carcinogenic properties and should be handled with care. None of the toxic volatile organic compounds in this mixture exceed OSHA minimum percentages for hazardous compounds or carcinogens and therefore do not require MSDS information under current regulations. See the Certificate of Analysis for the complete list of toxic volatile organic compounds contained in this mixture.

EC Classification: Not available.

EC Risk: None listed.

EC Risk: None listed.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Difficulty in breathing.

Physical Hazards: Cylinder may rupture or explode if exposed to heat.

Potential Health Effects (Short Term Exposure)

Inhalation: Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination.

Skin Contact: No significant adverse effects.

Eye Contact: No significant adverse effects.

Ingestion: Ingestion of a gas is unlikely.

Listed as a Carcinogen/Potential Carcinogen

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

4. First Aid Measures

Inhalation: If adverse effects occur, remove to a well ventilated area. If breathing is difficult, have qualified personnel give oxygen. If not breathing, have qualified personnel give artificial respiration. Get immediate medical attention.

Skin Contact: None.

Eye Contact: None.

Ingestion: Not applicable.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible fire hazard applicable to the identified NIST cylinder. Cylinder may rupture or explode if exposed to heat.

Extinguishing Media: Regular dry chemical, carbon dioxide.

Fire Fighting: Move cylinder from fire area if it can be done without risk. Avoid inhalation of material. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): Not applicable.

Mehtod used: Not applicable.

Autoignition temperature (°C): Not applicable.

Flammability Limits in Air (Volume %): Upper: Not applicable.

Lower: Not applicable.

6. Accidental Release Measures

Occupational Release: Stop leak if possible without personal risk. Isolate hazard area and deny entry. Refer to Section 13, "Disposal Considerations".

7. Handling and Storage

Storage: Store and handle in accordance with all current regulations and standards. Secure cylinder to prevent physical damage. Keep valve protective cap on cylinder when not in use. Keep separated from incompatible substances. Store in a well ventilated area. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. This SRM should be stored under normal laboratory conditions within the temperature range of 15 °C and 30 °C.

Safe Handling Precautions: Wear safety goggles. See Section 8, "Exposure Controls and Personal Protection".

8. Exposure Controls and Personal Protection

Nitrogen Gas

ACGIH (inhalation): simple asphyxiant

Ventilation: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Respirator: A respiratory protection program that meets OSHA 29 CFR and ANSI Z88.2 requirements must be followed if workplace conditions warrant a respirator. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified under NIOSH.

Eye Protection: Wear safety goggles. An eye wash station should be readily available near handling and use areas.

Personal Protection: Wear protective clothing. Wear safety shoes when moving cylinder(s).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Colorless, odorless gas.

Relative Molecular Mass: 28.01

Molecular Formula: N_2

Boiling Point (° C): − 196

Freezing Point (° C): − 210

Vapor Density (air = 1): 0.97

Volatility (%): 100

Solubility in Water: 1.6 % @ 20 ° C

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid inhalation of material. Protect cylinder from physical damage. Cylinder may rupture or explode if exposed to heat. Avoid contact with incompatible materials.

Incompatibilities: Oxidizing materials, Lithium.

Fire/Explosion Information: Refer to Section 5, "Fire Fighting Measures".

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation _____ Skin _____ Ingestion

Nitrogen Gas: Compressed nitrogen gas is a simple asphyxiant.

Health Effects (Acute Exposure): The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. In sudden acute asphyxia, unconsciousness may be immediate. With slow development, there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgment, emotional instability, and rapid fatigue. As the asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma and death are possible.

Medical Conditions Generally Aggravated by Exposure: Blood system disorders, heart or cardiovascular disorders, hormonal disorders, respiratory disorders.

12. ECOLOGICAL INFORMATION

Environmental Summary: No adverse ecological effects are expected.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: The cylinder is the property of the purchaser. Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Compressed Gas, N.O.S. (Toxic Volatile Organics in Nitrogen); UN1956; Hazard Class 2.2.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	Yes

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EU Classification: Not available.

EU Risk and Safety Phrases: None listed.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed on inventory.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Nitroge, Compressed Gas*, 13 September 2007.

Disclaimer: Physical and chemical data contained in this MSDS are provided only 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 in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.