Date of Issue:
23 August 2016

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 1667b
SRM Name: Propane in Air (Nominal Amount-of-Substance Fraction 50 μmol/mol)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a primary gas mixture of propane in air supplied in a DOT 3AL specification aluminum (6061 alloy) cylinder with a water volume of 6 L. This SRM is intended for the calibration of instruments used for propane determinations and for other applications. Mixtures are shipped with a nominal pressure exceeding 12.4 MPa (1800 psig). The cylinder is the property of the purchaser and is equipped with a CGA-590 brass valve, which is the recommended outlet for this propane mixture.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
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1-800-424-9300 (North America)
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2. Hazards Identification

Classification

Physical Hazard: Compressed Gas
Health Hazard: Not classified.

Label Elements

Symbol

Signal Word
WARNING

Hazard Statement(s)
H280 Contains gas under pressure; may explode if heated.

Precautionary Statement(s)
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. Composition and Information on Hazardous Ingredients

Substance: Propane in air, compressed gas

Other Designations:

Propane: *n*-Propane; dimethyl methane; propyl hydride; propylhydride; liquefied petroleum gas; LPG.
Air: Compressed air

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Compressed Air	132259-10-0	not assigned	>99
Propane	74-98-6	200-827-9	0.005

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Not applicable.

Eye Contact: Not applicable.

Ingestion: Ingestion of a gas is unlikely.

Most Important Symptoms/Effects, Acute and Delayed: No information on significant adverse effects.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard applicable to the identified NIST cylinder. Cylinders may rupture or explode if exposed to heat. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Use extinguishing media appropriate to the surrounding fire.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Oxides of carbon.

Special Protective Equipment and Precautions for Fire-Fighters: Move cylinder from fire area if it can be done without personal risk. Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 0 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection". Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Methods and Materials for Containment and Clean up: Stop leak if possible without personal risk. Isolate hazard area and deny entry. Stay upwind and keep out of low areas.

7. HANDLING AND STORAGE

Safe Handling Precautions: Close valve after each use and when empty. Keep valve protection cap on cylinder when not in use.

Storage: Store and handling in accordance with all current regulations and standards. Secure cylinder to prevent physical damage. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity"). Store in well-ventilated area. Subject to storage regulations, OSHA 29 CFR 1910.101.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Propane

OSHA (PEL):	1800 mg/m^3 (1000 ppm) TWA
ACGIH (TLV):	1800 mg/m^3 (1000 ppm) TWA
NIOSH (REL):	1800 mg/m^3 (1000 ppm) TWA
	2100 mg/m^3 (10 % LEL) IDLH

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

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body 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. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Compressed Air (>99 % concentration in this SRM)

Descriptive Properties

Appearance (physical state, color, etc.)	colorless, compressed gas
Molecular Formula	varies
Molar Mass (g/mol)	varies
Odor	odorless
Odor threshold	not available
pH	not applicable
Evaporation rate	not applicable
Melting point/freezing point (ºC)	–216 (–357 ºF)
Relative Density	0.0749 lbs/ft^3 at 21 °C
Vapor Pressure	760 mmHg at –194 ºC
Vapor Density (air = 1)	1
Viscosity (cP)	0.01853 at 26.85 ºC
Solubility(ies)	slightly soluble in water
Partition coefficient (n-octanol/water)	not available

Thermal Stability Properties

Autoignition Temperature	not applicable
Thermal Decomposition	not applicable
Initial boiling point and boiling range (ºC)	–194 (–317 ºF)
Explosive Limits, LEL	not applicable
Explosive Limits, UEL	not applicable
Flash Point	not applicable
Flammability (solid, gas)	not applicable

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal pressure and temperature.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.

Incompatible Materials: No data available.

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

Hazardous Decomposition: Miscellaneous decomposition products.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation _____ Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: No information on significant adverse effects.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: No information on significant adverse effects.

Skin Contact: No information on significant adverse effects.

Eye Contact: No information on significant adverse effects.

Ingestion: Ingestion of a gas is unlikely under normal conditions of use.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified, the concentration of propane is below the cut off value of 1 %.
Propane, Rat, Inhalation LC50: 658 mg/L (4 h)
Rat, Inhalation LC50: >800 000 ppm (15 min)

Skin Corrosion/Irritation: Not applicable.

Serious Eye Damage/Eye Irritation: Not applicable.

Respiratory Sensitization: No data available.

Skin Sensitization: No data available.

Germ Cell Mutagenicity: Not classified.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ Yes X No
Propane is not listed by NTP, IARC or OSHA as a carcinogen/potential carcinogen.

Reproductive Toxicity: Not classified.

Specific Target Organ Toxicity, Single Exposure: Not classified; the concentration of propane is below the cut off value of 1 %.

Specific Target Organ Toxicity, Repeated Exposure: Not classified.

Aspiration Hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations (propane), U.S. EPA 40 CFR 262, Hazardous Waste Number: D001.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1956; compressed gas, n.o.s. (propane in air); Hazard Class 2.2.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Identified cylinder not regulated.

SARA Title III Section 302 (40 CFR 355.30): Identified cylinder not regulated.

SARA Title III Section 304 (40 CFR 355.40): Identified cylinder not regulated.

SARA Title III Section 313 (40 CFR 372.65): Identified cylinder not regulated.

OSHA Process Safety (29 CFR 1910.119): Identified cylinder not regulated.

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

ACUTE HEALTH:	No.
CHRONIC HEALTH:	No.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	Yes.

State Regulations:
California Proposition 65: Not regulated.

U.S. TSCA Inventory: Propane is listed.

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

Canadian Regulations:
WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 23 August 2016

Sources: ChemADVISOR, Inc., SDS, *Compressed Air, Breathing Air*, 095 December 2015.

ChemADVISOR, Inc., SDS, *Propane*, 09 December 2015.

National Oceanic and Atmospheric Agency, CAMEO Chemicals Database, *Propane CAS No. 74-98-6*, June 1999, CRIS Code: PRP; available at http://cameochemicals.noaa.gov/chris/PRP.pdf (accessed Aug 2016).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System

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

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.