

Material Safety Data Sheet



Flammable Liquefied Gas Mixture: Dimethyl Sulfide / Propane / Propionitrile

Section 1. Chemical product and company identification

Product Name : Flammable Liquefied Gas Mixture: Dimethyl Sulfide / Propane / Propionitrile
Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253
Product use : Synthetic/Analytical chemistry.
MSDS# : 007620
Date of Preparation/Revision : **10/12/2007.**
In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas.
Emergency overview : Warning!
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
HARMFUL IF SWALLOWED.
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
VAPOR MAY CAUSE FLASH FIRE.
CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, NERVOUS SYSTEM, LIVER, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA, NOSE, SINUSES, THROAT.
Do not ingest. Avoid contact with skin and clothing. Avoid breathing gas. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Contact with rapidly expanding gases can cause frostbite.
Routes of entry : Inhalation,Dermal,Eyes
Potential acute health effects
Eyes : Irritating to eyes.
Skin : Irritating to skin.
Inhalation : Irritating to respiratory system.
Ingestion : Ingestion is not a normal route of exposure for gases
Potential chronic health effects : **CARCINOGENIC EFFECTS** Not available.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS: Not available.
Medical conditions aggravated by overexposure : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Propane	74-98-6	98 - 99	ACGIH TLV (United States, 1/2007). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 1000 ppm 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 1800 mg/m ³ 10 hour(s).

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Propionitrile	107-12-0	0.0001 - 1	OSHA PEL (United States, 11/2006). TWA: 1800 mg/m ³ 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 6 ppm 10 hour(s). TWA: 14 mg/m ³ 10 hour(s). OSHA PEL (United States, 11/2006). Skin Notes: as CN TWA: 5 mg/m ³ 8 hour(s).
Dimethyl Sulfide	75-18-3	0.0001 - 1	ACGIH TLV (United States, 1/2007). TWA: 10 ppm 8 hour(s).

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : The lowest known value is 449.85°C (841.7°F) (propane).
- Flammable limits** : The greatest known range is Lower: 2.1% Upper: 9.5% (propane)
- Products of combustion** : These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...), sulfur oxides (SO₂, SO₃...).
- Fire hazards in presence of various substances** : Extremely flammable in presence of open flames, sparks and static discharge, of oxidizing materials.
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.
Extremely flammable. Gas may accumulate in confined areas, travel considerable distance to source of ignition and flash back causing fire or explosion.
- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

- Handling** : Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire, minimize ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor or dust concentrations below any explosive limits. Use explosion-proof ventilation equipment.

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : 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.
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : A self-contained breathing apparatus should be used to avoid inhalation of the product.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

- Molecular weight** : Not applicable.
- Molecular formula** : Not applicable.
- Boiling/condensation point** : Not available.
- Melting/freezing point** : -185.9°C (-302.6°F) based on data for: propane.
- Critical temperature** : The lowest known value is 96.6°C (205.9°F) (propane).
- Vapor density** : The highest known value is 1.6 (Air = 1) (propane).
- Specific Volume (ft³/lb)** : Not applicable.
- Gas Density (lb/ft³)** : Weighted average: 0.12

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Extremely reactive or incompatible with oxidizing agents.
Slightly reactive to reactive with reducing agents, acids.

Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Propionitrile	LD50	39 mg/kg	Oral	Rat
	LD50	25 mg/kg	Oral	Guinea pig
Dimethyl Sulfide	LD50	3300 mg/kg	Oral	Rat
	LD50	3700 mg/kg	Oral	Mouse
	LC50	40250 ppm (1 hour(s))	Inhalation	Rat

- Chronic effects on humans** : Contains material which may cause damage to the following organs: kidneys, the nervous system, liver, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, nose/sinuses, throat.

- Other toxic effects on humans** : No specific information is available in our database regarding the other toxic effects of this material for humans.

Specific effects

- Carcinogenic effects** : No known significant effects or critical hazards.
- Mutagenic effects** : No known significant effects or critical hazards.
- Reproduction toxicity** : No known significant effects or critical hazards.

Section 12. Ecological information

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Propionitrile	Pimephales promelas (LC50)	96 hour(s)	1520 mg/l

- Products of degradation** : These products are carbon oxides (CO, CO₂) and water, nitrogen oxides (NO, NO₂...), sulfur oxides (SO₂, SO₃...).

- Toxicity of the products of biodegradation** : The products of degradation are less toxic than the product itself.

- Environmental fate** : Not available.


- Environmental hazards** : Practically non-toxic to aquatic organisms.



- Toxicity to the environment** : Not available.

Section 13. Disposal considerations

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

Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
DOT Classification	UN3161	Liquefied gas, flammable, n.o.s.	2.1	Not applicable (gas).		-

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TDG Classification	UN3161	Liquefied gas, flammable, n.o.s.	2.1	Not applicable (gas).		Explosive Limit and Limited Quantity Index 0.125 ERAP Index 3000 Passenger Carrying Ship Index Forbidden Passenger Carrying Road or Rail Index Forbidden
Mexico Classification	UN3161	Liquefied gas, flammable, n.o.s.	2.1	Not applicable (gas).		-

Section 15. Regulatory information

United States

- U.S. Federal regulations** :
- TSCA 8(b) inventory: propane; propionitrile; dimethyl sulphide
 - SARA 302/304/311/312 extremely hazardous substances: propionitrile
 - SARA 302/304 emergency planning and notification: propionitrile
 - SARA 302/304/311/312 hazardous chemicals: propane; propionitrile; dimethyl sulphide
 - SARA 311/312 MSDS distribution - chemical inventory - hazard identification: propane: Fire hazard, Sudden Release of Pressure; propionitrile: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; dimethyl sulphide: Fire hazard, Immediate (Acute) Health Hazard
 - Clean Water Act (CWA) 307: propionitrile
 - Clean Water Act (CWA) 311: No products were found.
 - Clean air act (CAA) 112 accidental release prevention: propane; propionitrile
 - Clean air act (CAA) 112 regulated flammable substances: propane
 - Clean air act (CAA) 112 regulated toxic substances: propionitrile

- State regulations** :
- Pennsylvania RTK: propane: (generic environmental hazard); propionitrile: (environmental hazard, generic environmental hazard); dimethyl sulphide: (environmental hazard, generic environmental hazard)
 - Massachusetts RTK: propane; propionitrile; dimethyl sulphide
 - New Jersey: propane; propionitrile; dimethyl sulphide

Canada

- WHMIS (Canada)** :
- Class A: Compressed gas.
 - Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
 - Class D-2B: Material causing other toxic effects (TOXIC).
 - CEPA DSL: propane; propionitrile; dimethyl sulphide

Section 16. Other information

United States

Label Requirements

- : FLAMMABLE GAS.
- CONTENTS UNDER PRESSURE.
- HARMFUL IF SWALLOWED.
- CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
- VAPOR MAY CAUSE FLASH FIRE.
- CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, NERVOUS SYSTEM, LIVER, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA, NOSE, SINUSES, THROAT.

Canada

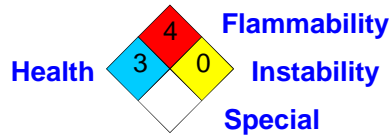
Label Requirements

- : Class A: Compressed gas.
- Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
- Class D-2B: Material causing other toxic effects (TOXIC).

Hazardous Material Information System (U.S.A.)

Health	*	3
Fire hazard		4
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.