



Material Safety Data Sheet

**1. Product and Company Identification**

**Product Name:** Propane  
**Synonym:** Propyl Hydride, Dimethyl Methane, 1-Propene Tetramer, L.P.G. (Liquefied Petroleum Gas)  
**Product use:** Fuel for heating, cooking, automobiles, welding/cutting; refrigerant, aerosol propellant, solvent  
**Manufacturer:** Keyera and Affiliates  
**Address:** Suite 600, Sunlife Plaza West  
 144 – 4<sup>th</sup> Avenue SW  
 Calgary, AB, T2P 3N4  
**MSDS Information:** 1-780-449-7910  
**Emergency Contact:** 1-866-377-7110

**2. Hazards Identification**

**EMERGENCY OVERVIEW**

- This product is **highly flammable!**
- **Propane is** classified as an **asphyxiant** by ACGIH (American Conference of Industrial Hygienists)

**POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE**

Exposure Route	Acute Health Effects	Symptoms of Exposure
<b>Eye:</b>	In gas form: no effect	-
	In liquid form: burn or frostbite	numbness, cold or burning sensation, blistering to blindness in severe cases
<b>Skin:</b>	In gas form: no known effects	-
	In liquid form: burn or frostbite	numbness, cold or burning sensation, white, pale, greyish-yellow or red skin, blistering in severe cases
<b>Inhalation:</b>	Effects on the Central Nervous system (CNS) may range from mild (respiratory depression) to severe effects (asphyxiation)	From irritation of the nose/throat, to nausea, headache, rapid breathing, dizziness to respiratory arrest, loss of consciousness (narcosis) and death in extreme cases
<b>Ingestion:</b>	Not expected to be a route of exposure	

**3. Composition/Information on Ingredients**

<b>Ingredient Name</b>	<b>Volume %</b>	<b>CAS No.</b>
Methane	0 – 0.3	74-82-8
Ethane	0.5 – 5.0	74-84-0
Propane	94.0 – 99.9	74-98-6
iso-Butane	0 – 2.0	75-28-5
n-Butane	0 – 0.5	106-97-8
Ethyl Mercaptan (Ethanethiol)	20 – 25 ppm	75-08-1

**4. First Aid Measures**

- Eyes:** Rinse with water for at least 20 minutes. Get medical attention immediately.
- Skin:** Remove contaminated clothing. Wash affected areas with soap and water for at least 20 minutes.  
If irritation or redness develops seek medical attention immediately.
- Ingestion:** Not expected to be a route of exposure.
- Inhalation:** Move the victim to an area of fresh air. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.



**5. Fire Fighting Measures**

<b>Flammability:</b> Yes	<b>Autoignition Temperature</b> 470°C (878°F)	<b>Flashpoint and Method:</b> -104°C (-156°F) Closed Cup
<b>NFPA:</b> Health 1, Flammability 4, , Instability 0		<b>LEL Lower Explosion Limit &amp; UEL Upper Explosion Limit:</b> 2.1% (LEL), 9.5-10.1% (UEL)
<b>Hazardous Combustion Products:</b> May include carbon monoxide (CO), carbon dioxide (CO <sub>2</sub> ), and acrid smoke.		
<b>Explosion:</b> Sensitive to Impact: No Sensitive to Static Discharge: Yes		
<b>Extinguishing Media:</b> Small Fire: Dry chemical or CO <sub>2</sub> , Large Fire: water spray or fog.		
<b>Special Fire Fighting Procedures:</b> <ul style="list-style-type: none"><li>• <b>DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS THE LEAK CAN BE STOPPED.</b></li><li>• Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece.</li><li>• Wear thermal protective clothing when the fire involves liquefied propane.</li><li>• Do not direct water at source of leak, especially with LPG to avoid icing.</li><li>• This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of ignition and heat.</li><li>• Move container from fire area if you can do it without risk.</li><li>• Stay away from ends of tanks.</li><li>• If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.</li><li>• Cool fire-exposed containers with flooding quantities of water applied from as far a distance as possible.</li><li>• Apply cooling water to containers that are exposed to flames until well after fire is out.</li><li>• Containers exposed to fire may explode or vent through pressure-relief devices.</li></ul>		
<b>Unusual Fire and Explosion Hazards:</b> <ul style="list-style-type: none"><li>• The highly flammable vapors are heavier than air and may accumulate in low areas and /or spread along ground to distant ignition sources and flash back.</li></ul>		



## 6. Accidental Release Measures

### ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE.

- Shut off leak/release source, if possible. Remove all sources of ignition.
- Isolate hazard area.
- Evacuate area of all unnecessary personnel.  
Large spill: consider downwind evacuation of at least 800 meters (1/2 mile)  
If tank, rail car or tank truck is involved in a fire, ISOLATE and consider initial evacuation in all directions for 1600 meters (1 mile).
- If possible, turn leaking LPG containers so that gas escapes instead of liquid.
- Ventilate area of leak or spill.
- Use non-sparking tools and grounded equipment.
- Direct addition of water to liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapor explosion (BLEVE)"
- Do not touch spilled liquefied propane with bare skin to avoid frostbite/freeze burn.
- Avoid runoff into storm sewers and ditches that lead to waterways.
- If a leak or spill has not ignited, use water spray to disperse the vapors or divert vapor cloud draft. Do not direct water at spill or source of leak.
- Prevent vapors or LPG from spreading through sewers, ventilation systems and confined spaces.
- See Guide 115, Emergency Response Guidebook (Transp Can/US Dept. of Transp).
- Odor from spill/release of odorized propane indoor, can be removed by circulating the air through absorbent charcoal, catalytic oxidation, or destruction with a UV scrubber.

## 7. Handling and Storage

### SPECIAL PRECAUTIONS

- Propane storage tanks, and transportation equipment including pipelines, rail cars and truck tanks may have sludge or scales contaminated with Naturally Occurring Radioactive Material (NORM) in the form of lead 210, decayed from radon gas.

### HANDLING PRECAUTIONS

- Use only in a well ventilated area.
- Avoid contact with eyes, skin, and clothing, and avoid inhalation of vapor.
- Keep product away from heat, sparks and open flame.
- Ground and bond containers when transferring liquefied gas.
- Use spark-proof tools and explosion proof equipment.
- Take precautionary measures against static discharges.

### STORAGE PRECAUTIONS

- Protect against physical damage to container.
- Store in a cool, dry, well-ventilated location, away from any area of fire-hazard.
- Separate from incompatibles. (See section 10)
- Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.



**8. Exposure Controls / Personal Protection**



**ENGINEERING CONTROLS**

- Ventilate area where product is used, stored and/or handled to maintain airborne concentrations below the LEL and OEL, especially in confined spaces.
- Exhaust/ventilate to the outside.
- Ventilation equipment must be explosion proof.
- Ventilation system should be grounded and separate from other exhaust ventilation systems. Adequate make-up air must be provided.



**PERSONAL PROTECTIVE EQUIPMENT**

Gloves: Recommended: neoprene and nitrile; not recommended: polyvinyl chloride PVC.  
 Use insulating gloves when handling liquefied propane.

Respirator: NIOSH Approved Supplied-Air Respirator or SCBA where large propane concentration is anticipated, and the exposure level is unknown or where an oxygen-deficient atmosphere may exist. Refer to CSA Standard "Selection, Use and Care of Respirators"

Eye: Safety glasses with side shields, safety goggles or face shields

Clothing: Flame-retardant coverall e.g. Nomex, Proban.  
 Protective apron and trousers worn over coveralls for handling liquefied propane.

**EXPOSURE LIMITS**

	Authority	15 MINS STEL or Ceiling	8-HOURS
Propane (CAS 74-98-6)	OSHA PEL	-	1000 ppm (1800 mg/m <sup>3</sup> )
	ACGIH TLV	Identified as an asphyxiant	
	NIOSH	-	1000 ppm (1800 mg/m <sup>3</sup> )
	Alberta, Ontario, BC	-	1000 ppm
IDLH: 2100 ppm Because L.P.G. may cause asphyxia at concentrations well above the lower explosive limit (LEL), the revised IDLH for L.P.G. is 2,000 ppm based strictly on safety considerations (i.e., being about 10% of the LELs of 1.9% for butane and 2.1% for propane).			



**KEYERA**

**Propane Odorized MSDS**

	<b>Authority</b>	<b>15 MINS STEL or Ceiling</b>	<b>8-HOURS</b>
Ethane (Alkane)	OSHA PEL	-	
	ACGIH TLV	Limits withdrawn. Instead, refer to "Minimal Oxygen Content" Appendix F of ACGIH*	
	NIOSH	-	
	Alberta, Ontario, BC	-	1000 ppm
Butane (all isomers)	OSHA PEL	-	-
	ACGIH TLV	1000 ppm (2370 mg/m <sup>3</sup> )	-
	NIOSH	-	800 ppm (1900 mg/m <sup>3</sup> )
	Alberta Ontario BC	- - 750 ppm (1778 mg/m <sup>3</sup> )	1000 ppm (2370 mg/m <sup>3</sup> ) 800 ppm (1900 mg/m <sup>3</sup> ) 600 ppm (1422 mg/m <sup>3</sup> )
Ethyl Mercaptan (CAS 75-08-1)	OSHA PEL	10 ppm (25 mg/m <sup>3</sup> ) ceiling	-
	ACGIH TLV	-	0.5 ppm (1.3 mg/m <sup>3</sup> )
	NIOSH	0.5 ppm (1.3 mg/m <sup>3</sup> ) 15-min ceiling	
	Alberta Ontario, BC		0.5 ppm (1.3 mg/m <sup>3</sup> ) 0.5 ppm

**9. Physical and Chemical Properties**

<b>Chemical Family:</b> Hydrocarbon	<b>Molecular Weight:</b> 44.10 g/mole	<b>Molecular Formula:</b> C <sub>3</sub> H <sub>8</sub>
<b>Specific Gravity:</b> 0.50 – 0.51	<b>Appearance:</b> Colorless gas	<b>Critical Temperature:</b> 96.6°C (205.9°F)
<b>Odor:</b> Skunk-like odor from addition of ethyl mercaptan		<b>Odor Threshold:</b> 0.76 ppb (ethyl mercaptan)
<b>Boiling Point:</b> -42.1°C (-43.8°F)	<b>Flash Point:</b> -104°C (-156°F)	<b>Melting/Freezing Point:</b> -189.7°C (-309.5°F)
<b>Density:</b> Gas: 1.91 kg/m <sup>3</sup> @ 15°C (59°F) Liquid: 580 kg/m <sup>3</sup> (36.2 lb/ft <sup>3</sup> )	<b>Vapor Density:</b> 1.52 (air = 1)	<b>Vapor Pressure:</b> ~ 1303 kPa @ 37.8°C (100 °F) (9774 mm Hg)
<b>Evaporation Rate:</b> >1 (Butyl Acetate = 1)	<b>Percent Volatile:</b> 100 by Volume	<b>Soluble in water (@ 25°C):</b> Slightly soluble



**10. Stability and Reactivity**

<b>Chemical Stability:</b> Stable under normal temperatures and pressures.
<b>Incompatibility with other Substances:</b> Yes /Oxidizers present a fire and explosion hazard.
<b>Other Reactivity Concerns:</b> Avoid incompatible materials (oxygen, chlorine gas), ignition sources, excess heat, and electrical sparks.
<b>Hazardous Polymerization:</b> Has not been reported to occur under normal temperature and pressure conditions.
<b>Hazardous Decomposition Products:</b> Carbon monoxide, carbon dioxide, irritating and toxic fumes and gases.

**11. Toxicological Information**

<b>Routes of Entry:</b>				
Skin Contact: Yes	Skin Absorption: Yes	Eye Contact: Yes	Inhalation: Yes	Ingestion: Unlikely
<b>Acute Exposure:</b> See Section 2 (Hazard Identification)				
<b>Chronic Exposure:</b>				
<b>Skin:</b> Not known to be a skin-sensitizer. Repeated and prolonged contact may cause dry, red, cracked skin (dermatitis)				
<b>Inhalation:</b> Repeated or prolonged exposure may cause damage to the Central Nervous System (CNS), the nervous and the heart system				
<b>Carcinogenicity:</b> Propane is not found on the following lists: U.S. OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore is neither considered to be nor suspected to be a cancer-causing agent by these agencies				
<b>Sensitization:</b> None	<b>Reproductive Toxicology:</b> None	<b>Teratogenicity:</b> None	<b>Mutagenicity</b> : None	

**Lethality Tests:**

Chemical Name	CAS No.	LC50	
Propane	74-98-6	Rat, inhalation: >800000ppm, 15-mins (oxygen was also added to maintain a level of ~20vol%)	
n-Butane	106-97-8	Rat, inhalation: 658 mg/L 4hr	
Ethyl Mercaptan (Ethanethiol)	75-08-1	LD50 Rat, ip: 226 mg/kg Rat, oral: 682 mg/kg	LC50 Rat, inhalation: 2770 ppm/4 hr Mouse, inhalation: 4420 ppm/4hr

## 12. Ecological Information

### Terrestrial Fate:

- Photolysis and hydrolysis are not expected to be important in soil.
- Not expected to bioaccumulate.
- Propane is readily degraded by soil bacterium; within 24 hr. propane was oxidized to acetone.
- Volatilization from soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of  $7.07 \times 10^{-1}$  atm-cu m/mole. Groundwater contamination is not expected.

### Aquatic Fate:

- Propane is only slightly soluble in water. Spills will spread on the water surface and the majority will evaporate. Estimated volatilization half-lives for a model river and model lake are 41 min and 2.6 hours, respectively.
- Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

### Atmospheric Fate:

- If released to air, a vapor pressure of 7,150 mm Hg at 25 deg C indicates propane will exist solely as a gas in the atmosphere.
- Propane is not expected to be susceptible to direct photolysis by sunlight, but will be degraded in the atmosphere by reacting with hydroxyl radicals; the half-life for this reaction in air is estimated to be 14 days.
- Propane also has the potential to partake in photochemical reactions to produce ozone pollutant.

## 13. Disposal Considerations

### Waste Disposal:

- Excess/waste propane can be disposed by incineration in a waste gas incinerator or flare.
- Propane can also be reused as fuel for boilers and heaters.



### 14. Transport Information

#### TDG (Canada) and DOT (U.S.) CLASSIFICATION

**PROPER SHIPPING NAME:** Liquefied Petroleum Gas (Propane)  
**CLASS:** 2.1  
**PACKING GROUP:** None

**UN NUMBER:** UN1075  
**LABEL/PLACARD:**



This product may be shipped under Special provision #29 under TDG

### 15. Regulatory Information

#### CANADA

- DSL: Propane is on the Canadian DSL List
- NPRI: Propane is on the National Pollutant Release Inventory (reporting threshold: 1 tonne air release)
- E2: Propane is on the Environmental Emergency E2 list
- WHMIS : Class A – Compressed Gas      Class B1 - Flammable Gas



#### UNITED STATES

- SARA 110: Propane is not on the Priority List of Toxic Substances
- TSCA: Propane is on the Toxic Substance Control Act Inventory List
- TRI: Propane is not on the Toxic Release Inventory

### 16. Other Information

Prepared for: Keyera Health and Safety  
Issue Date: January 31, 2014

#### **Disclaimer of Expressed and Implied Warranties**

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