

Safety Data Sheet (Canada)

1. Identification

Product Identifier: Natural Gas

Other Means of Identification: Methane, Sales Gas, Pipeline Gas

Product use: Fuel for space/water heating, cooking, transportation; raw material for products such as paints, plastics, fertilizers etc.

Restrictions on use: Do not use for purposes other than those listed above

Manufacturer: Keyera and Affiliates




Address: Suite 600, Sunlife Plaza West
144 – 4th Avenue SW
Calgary, AB, T2P 3N4

SDS Information: 1-780-449-7910

Emergency Contact (24 hours): 1-613-996-6666 (CANUTEC, Canada)
1-800-424-9300 (CHEMTREC, U.S.)

2. Hazards Identification

GHS Hazards

Pictogram	Classification	Hazard Statements
	Flammable Gases – Category 1	Extremely flammable gas
	Gases Under Pressure – Compressed Gas	Contains gas under pressure; may explode if heated.
	Specific Target Organ Toxicity, Single Exposure – Category 3	May cause drowsiness or dizziness.
No pictogram	Simple Asphyxiant	May displace oxygen and cause rapid suffocation.

Signal Word: Danger

Precautionary Statements:

Prevention

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Avoid breathing gas/vapors.
- Use only outdoors or in a well-ventilated area.

Response

- Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- In case of leakage, eliminate all ignition sources.
- If inhaled: Remove person to fresh air and keep comfortable for breathing.
- Call a doctor/physician if you feel unwell.

Storage

- Protect from sunlight.
- Store in a well-ventilated place. Keep container tightly closed.
- Store locked up.

Disposal

- Dispose of contents/container in accordance with applicable local, provincial/state, and federal regulations.

3. Composition/Information on Ingredients

Chemical Name: Natural Gas
Common Name/Synonyms: Methane, Sales Gas, Pipeline Gas

Ingredient Name	Volume %	CAS No.
Hydrogen	trace	
Helium	< 0.05 %	7440-59-7
Nitrogen	0.1 – 1.0 %	7727-37-9
Methane	80 – 90 %	74-82-8
Ethane	1 – 10 %	74-84-0
Propane	0.1 – 4 %	74-98-6
iso-Butane	0 – 0.5 %	75-28-5
n-Butane	0 – 1 %	106-97-8
iso-Pentane	0 – 0.2 %	78-78-4
N-Pentane	0 – 0.2 %	109-66-0
C6+	0 – 0.2 %	
Carbon Dioxide	< 0.1 %	124-38-9
Hydrogen Sulfide H ₂ S	<0.1vppm	7783-06-4
Methyl mercaptan	1 - 10 vppm	74-93-1
Ethyl mercaptan	1 – 5 vppm	75-08-1

4. First Aid Measures

Immediate Medical Attention and Special Treatment:
Treat symptomatically and supportively. Refer also to Table below.

First Aid:	
Inhalation:	Remove person to fresh air and keep comfortable for breathing. Call a doctor/physician if you feel unwell.
Skin:	Frostbite is possible with rapid release of liquefied gas. Rinse with warm water, do not use hot water, or wrap with blanks. Get immediate medical attention. If liquefied natural gas is on skin: take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: get medical attention.
Eyes:	If liquefied natural gas contact the eye, rinse cautiously with water for several minutes. Get immediate medical attention.
Ingestion:	Not expected to be a route of exposure. If ingested, seek medical attention.

Most Important Effects and Symptoms, Acute or Delayed:

Exp Route	Health Effects	Symptoms of Exposure
Inhalation:	Methane, ethane & propane are asphyxiants , depleting oxygen in the air.	Loss of consciousness, death.
Skin:	Sudden release of liquefied gas may cause burn or frostbite.	numbness, cold or burning sensation, white, pale, greyish-yellow or red skin, blistering in severe cases.
Eye:	Sudden release of liquefied gas may cause burn or frostbite.	Blurred vision, blistering.

5. Fire Fighting Measures

<p>Flammability: Yes.</p>	<p>Hazardous Combustion Products: Carbon monoxide (CO), carbon dioxide (CO₂), and acrid smoke.</p>
<p>Explosion: Sensitive to impact: No</p>	<p>Sensitive to static discharge: Yes</p>
<p>Extinguishing Media: Small Fire: dry chemical or CO₂. Large Fire: water spray or fog.</p>	
<p>Unsuitable Extinguishing Media:</p> <ul style="list-style-type: none"> • Foam. • Water jet: Do not direct water at source of leak, avoid icing. 	
<p>Special Protective Equipment for Firefighters:</p> <ul style="list-style-type: none"> • Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece. • Wear thermal protective clothing IF the fire involves liquefied natural gas. 	
<p>Precautions for Firefighters:</p> <ul style="list-style-type: none"> • DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS THE LEAK CAN BE STOPPED. • If tank, rail car or tank truck is involved in a fire, ISOLATE and consider initial evacuation in <u>all directions</u> for 1600 meters (1 mile). • Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. • Move container from fire area if you can do it without risk. • For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. • Do not direct water at source of leak or safety devices; icing may occur. • Cool fire-exposed containers with flooding quantities of water applied from as far a distance as possible, until well after fire is out. • Stay away from ends of tanks. • Containers exposed to fire may explode or vent through pressure-relief devices. • Refer to Guide 115 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation). 	
<p>Unusual Fire and Explosion Hazards:</p> <ul style="list-style-type: none"> • This product can act as an asphyxiant by displacing oxygen in the air. Skunky-odor mercaptan is added to the product as a warning agent. • The highly flammable vapors may travel to ignition sources and flash back. 	

6. Accidental Release Measures

Protective Equipment:

Gloves:	Recommended: neoprene and nitrile. IF liquified, cold resistant gloves. Not recommended: polyvinyl chloride PVC.
Clothing:	Flame-retardant coverall e.g. Nomex, Proban. Protective apron, trousers and cold resistant clothing should be worn over coveralls for handling IF the gas is liquified.
Respirator:	NIOSH Approved Supplied-Air Respirator or SCBA where large butane concentration is anticipated, and the exposure level is unknown or where an oxygen-deficient atmosphere may exist.
Eye:	Safety glasses with side shields, safety goggles or face shields.
Large spills:	Wear full protective clothing and NIOSH-approved SCBA with full face-piece.

Precautions:

- Do not breathe vapors.
- **This product can act as an asphyxiant by displacing oxygen in the air.**
- The highly flammable vapors may travel to ignition sources and flash back.

Emergency Procedures:

- Shut off leak/release source, if it can be done safely.
- Eliminate all ignition sources if safe to do so.
- Isolate hazard area.
- Evacuate area of all unnecessary personnel.
Large spill/release: consider downwind evacuation of at least 800 meters (½ 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).
- Keep unnecessary and unprotected personnel from entering.
- Emergency personnel must wear appropriate personal protective equipment.
- Ventilate area of leak.

Containment and Clean-up:

- Use non-sparking tools and equipment.
- If a leak has not ignited, use water spray to disperse the vapors or divert vapor cloud draft. Do not direct water at source of leak; icing may occur.
- Prevent vapors or LPG from spreading to sewers, ventilation systems, confined spaces.
- Refer to Guide 115 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation).

7. Handling and Storage

Handling Precautions :

- **This product can act as an asphyxiant by displacing oxygen in the air. Skunky-odor mercaptan is added to the product as a warning agent**
- Use only outdoors or in a well-ventilated area.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Avoid breathing gas/vapors.
- Use non-sparking tools and equipment.
- IF this product is refrigerated/liquefied, wear protective gloves/ protective clothing/ eye protection/ face protection when handling cold, liquefied gas.

Storage Precautions:

Locations

- Store in a cool, dry, well-ventilated location, away from any area of fire-hazard.
- Outside or detached storage is preferred.
- Storage and use areas should be No Smoking areas.
- Store locked-up.

Containers

- Keep container tightly closed.
- 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
- Ground and bond containers.

Other precautions

- Separate from incompatibles like oxidizers e.g. chlorine gas and oxygen.

8. Exposure Controls / Personal Protection

EXPOSURE LIMITS

	Authority	15 MINS STEL or Ceiling	8-HOURS
Methane* (CAS 74-82-8)	Alberta	-	-
	Ontario, BC	-	1000 ppm
Ethane* (CAS 74-84-0)	Alberta, Ontario, BC	-	1000 ppm
Propane* (CAS 74-98-6)	Alberta, Ontario, BC	-	1000 ppm
Butane (all isomers)	Alberta	-	1000 ppm (2370 mg/m ³)
	Ontario	-	800 ppm (1900 mg/m ³)
	BC	750 ppm (1778 mg/m ³)	600 ppm (1422 mg/m ³)
Pentane (all isomers)	Alberta, Ontario	-	600 ppm (1770 mg/m ³)
	BC	-	600 ppm
Carbon dioxide* (CAS 124-38-9)	Alberta	30000 ppm (54000 mg/m ³)	5000 ppm (9000 mg/m ³)
	Ontario	30000 ppm	5000 ppm
	BC	-	5000 ppm (9000 mg/m ³)

* Identified as chemicals which may cause asphyxia according to ACGIH. According to the U.S. National Institute for Occupational Safety & Health, an oxygen deficient atmosphere is one with an ambient pO₂ less than 132 torr. at sea level the minimum requirement is 19.5% oxygen (148 torr pO₂). The partial pressure of oxygen decreases significantly with increase in altitude.



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; IF liquified, wear cold insulating gloves.
Not recommended: polyvinyl chloride PVC.
- Clothing:** Flame-retardant coverall e.g. Nomex, Proban. Protective apron, trousers and cold resistant clothing should be worn over coveralls for handling liquefied natural gas.
- Respirator:** NIOSH Approved Supplied-Air Respirator or SCBA where large butane concentration is anticipated, and the exposure level is unknown or where an oxygen-deficient atmosphere may exist.
- Eye:** Safety glasses with side shields, safety goggles or face shields.

9. Physical and Chemical Properties

Chemical Formula: Not Applicable	Molecular Weight: 17.0 – 19.0 g/mole	Chemical Family: Alkanes
Appearance: Colorless gas Colorless liquid when pressurized	Odor: Slight hydrocarbon odor	Odor Threshold: None, unless mercaptan is added as a warning agent
pH: Not applicable	Melting/Freezing Point: -182.6°C (-296.7°F) methane	Boiling Point: -161.5°C (-258.7°F) methane
Flash Point: -223°C (-369°F) methane	Flammability: Yes	Evaporation Rate: >1 (Butyl Acetate = 1)
Upper-Lower Explosive Limit: 5% (LEL), 15% (UEL) as methane	Vapor Pressure: Not available	Vapor Density: 0.6 – 0.7 (air = 1)
Specific Gravity: Liquid: 0.574-0.578	Soluble in water (@20°C): Slightly soluble	Percent Volatile: 100 by volume
Partition Coefficient n-octanol/water: Not available	Auto-Ignition Temperature: Not available	Decomposition Temperature: Not available
Viscosity: Not available	CAS Registry number: 8006-14-2 68410-63-9 (dried)	High Heating Value HHV 38 – 45 MJ/m ³

Relative density

10. Stability and Reactivity

Reactivity: Avoid incompatible materials: may react violently with oxidizers.
Chemical Stability: Stable under normal temperatures and pressures.
Possibility of Hazardous Reactions: Polymerization has not been reported to occur under normal temperature and pressure conditions.
Conditions to Avoid: Extreme temperatures and incompatible materials. Protect pressurized containers from physical damage.
Incompatible Materials: Reacts violently with oxidizing agents such as perchlorates, peroxides, permanganates, nitrates. <ul style="list-style-type: none"> • Ignites spontaneously in the presence of chlorine dioxide. • Forms explosive mixtures readily with air/oxygen. Will burn/explode in the presence of chlorine, bromine pentafluoride, oxygen difluoride and nitrogen trifluoride.
Hazardous Decomposition Products: <ul style="list-style-type: none"> • No decomposition if stored and applied as directed. • Combustion forms carbon monoxide, carbon dioxide, irritating and toxic fumes/gases.

11. Toxicological Information

Exposure Route	Acute Health Effects	Symptoms of Exposure
Inhalation:	Effects on the Central Nervous system (CNS) may range from mild (respiratory depression) to severe (asphyxiation).	may range from rapid breathing, dizziness to respiratory arrest, loss of consciousness (narcosis) and death in extreme cases.
Skin:	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.
Eye:	In gas form: no known effects.	-
	In liquid form: burn or frostbite.	numbness, cold or burning sensation, blistering to blindness in severe cases.
Ingestion:	Not expected to be a route of exposure.	

Chronic Exposure:			
Inhalation: Not available.			
Skin: Not known to be a skin-sensitizer.			
Medical Conditions Aggravated by Exposure: Not available.			
Sensitization: No	Reproductive Toxicology: No	Teratogenicity: No	Mutagenicity: No
Carcinogenicity: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.	Irritancy: No.	Target Organs: Central Nervous System (CNS).	

Lethality Tests:

Chemical Name	CAS No.	LC50 or LD50
Methane	74-82-8	Mouse, inhalation 326 g/m ³ 2hr
Ethane	74-84-0	Rat, inhalation: 658 mg/L 4 hrs.
Propane	74-98-6	Rat, inhalation: >800000ppm, 15-mins (oxygen was also added to maintain a level of ~20vol%)
		Rat, inhalation: 658 mg/L 4hrs.
n-Butane	106-97-8	Rat, inhalation: 658 mg/L 4hrs.
iso-Butane	72-28-5	Rat, inhalation: 658 mg/L 4hrs.
iso-Pentane	78-78-4	Rat, inhalation: 280 g/m ³ 4 hr
n-Pentane	109-66-0	Rabbit, dermal: 3000 mg/kg, Mouse, oral: 5000 mg/kg Rat, inhalation: 364 mg/L 4hr

12. Ecological Information

<p>Persistence & Degradability: Not expected to persist in the environment.</p>	<p>Bioaccumulative Potential: Not expected to bioaccumulate.</p>
<p>Mobility: When released to soil, natural gas is expected to evaporate into the atmosphere.</p>	<p>Other Adverse Effects: See below.</p>

Terrestrial Fate:

- Volatilization from soil surfaces is expected to be an important fate process.
- Photolysis and hydrolysis are not expected to be important in soil.
- Groundwater contamination is not expected.

Aquatic Fate:

- Spills will spread on the water surface and the majority will evaporate.
- Hydrolysis is not expected to be an important environmental fate.

Atmospheric Fate:

- Spilled/released natural gas will evaporate/dissipate rapidly.
- Unlike other VOCs (Volatile Organic Compounds) such as ethane, propane, butane, methane is not known to react with oxides of nitrogen (NO_x) in the presence of sunlight, to form ozone O₃, a pollutant in the lower atmosphere.
- However, methane is a potent Green House Gas with a Global Warming Potential about 21 times that of carbon dioxide.
- In general VOCs have short lifetimes in the atmospheres. A few VOCs, like ethane and acetone, are longer-lived and impact tropospheric chemistry on hemispheric scales. Ethane has an average lifetime in the atmosphere of 2 months. In the atmosphere, it is destroyed rapidly by reacting with hydroxide radicals. The average lifetime in the atmosphere is 9 years for methane.

Eco Toxicity Tests:

Chemical Name	Species	Test Method	LC50/ EC50/
iso-Pentane (CAS 78-78-4)	Daphnia magna (water flea)	Static test; 48 hours	EC50 = 2.3 mg/L
n-Pentane (CAS 109-66-0)	Daphnia magna (water flea)	Static test; 48 hours	LC50 = 9.74 mg/L
	Oncorhynchus mykiss (rainbow trout)	Semi-static test; 96 hours	LC50 = 9.87 mg/L
	Pimephales promelas (fathead minnow)	Semi-static test; 96 hours	LC50 = 11.59 mg/L
	Lepomis macrochirus (bluegill sunfish)	Semi-static test; 96 hours	LC50 = 9.99 mg/L

13. Disposal Considerations

Waste Disposal:

- Dispose of waste material at an approved waste treatment/disposal facility in accordance with applicable local, provincial, and federal regulations.
- Excess/waste butane can be disposed by incineration in a waste gas incinerator or flare.
- Natural gas can also be reused as fuel for boilers and heaters.

14. Transport Information

TDG (Canada) CLASSIFICATION

UN NUMBER: UN1971
PROPER SHIPPING NAME: Natural Gas, Compressed with high methane content
CLASS: 2.1
PACKING GROUP: N/A
LABEL/PLACARD:



SPECIAL PROVISION: None

MARINE POLLUTANT: No

15. Regulatory Information

CANADA

Regulatory List	Chemical
DSL Domestic Substance List	Ethane, Propane, n-Butane, Isobutane, Isopentane
E2 Environmental Emergencies	Methane, Ethane, Propane, n-Butane, Isobutane
NPRI National Pollutant Release Inventory	Propane, Butane (all isomers), Pentanes (all isomers) are under VOC Volatile Organic Compound group in NPRI

16. Other Information

NFPA Hazard Rating:

Health 1, Flammability 4, Instability 0



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Keyera Health and Safety

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Main Changes

Glossary

ACGIH – American Conference of Governmental Industrial Hygiene

DOT – US Department of Transportation

IARC – International Agency for Research on Cancer

IDLH – Immediately Dangerous to Life and Health

NIOSH – National Institute for Occupational Safety & Health

NTP – National Toxicology Program

OSHA – Occupational Safety & Health Administration of the US Depart of Labour

PEL – Permissible Exposure Limit

SARA – Superfund Amendments and Reauthorization Act of 1986

SCBA – Self-Contained Breathing Apparatus

STEL – Short Term Exposure Limit

TDG – Canada Transportation of Dangerous Goods

TRI – US Toxic Release Inventory

TSCA – Toxic Substance Control Act

TWA – Time Weighed Average

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~ End of Safety Data Sheet ~