

**DAKOTA GASIFICATION COMPANY**

420 Country Road 26
 Beulah, ND 58523-9400
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MATERIAL SAFETY DATA SHEET**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT IDENTIFIER: SYNTHETIC NATURAL GAS
 GENERAL USE:
 PRODUCT DESCRIPTION:

MANUFACTURER:
 Dakota Gasification Company
 420 County Road 26
 Beulah, North Dakota 58523-9400
 (701) 873-6677

EMERGENCY TELEPHONE NUMBERS:
 Dakota Gasification (701) 873-6600
 CHEMTREC (800) 424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS	WT. %	CAS Registry #
METHANE	95	74-82-8
HYDROGEN	3.10	1333-74-0
CARBON DIOXIDE	1.10	124-38-9

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):**EXPOSURE LIMITS 8 hrs. TWA (ppm)**

	OSHA PEL	ACGIH TLV
Methane	Not established-simple asphyxiant	Not established-simple asphyxiant

3. HAZARDS IDENTIFICATION / EMERGENCY OVERVIEW:

Methane is generally considered nontoxic. Exposures to concentrations of up to 9 percent methane have been reported without apparent ill effects; inhalations of higher concentrations eventually causes a feeling of pressure on the forehead and eyes, but the sensation ends after returning to fresh air. Methane is a simple asphyxiant. Methane poses hazards to personnel through its flammability. All precautions necessary for the safe handling of any flammable compressed gas must be observed in working with methane. Very dangerous fire and explosion hazard when exposed to heat or flame. Issue warning --- high flammability. Restrict access. Evacuate area. Reacts violently with powerful oxidizers. Explosive in the form of vapor or gas when exposed to heat or flame. Flashback along vapor trail may occur. May explode if ignited in an enclosed area. To fight fire, stop flow of gas.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Vapors are nonirritating to the eyes
SKIN CONTACT: Practically harmless to the skin; but, because it evaporates quickly it may cause frostbite.
INHALATION: Vapors are nonirritating to the throat. High concentrations may cause asphyxiantion.

4. FIRST AID MEASURES

- EYES: Not irritating to eyes, nose or throat.
SKIN: Liquid contact will cause frostbite. Flush affected areas with plenty of water. Do Not Rub Affected Frostbitten Areas. Encourage victim to exercise the affected part while it is being warmed.
INHALATION: Remove to fresh air. Support respiration. If breathing is difficult, give oxygen.
INGESTION:
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5. FIRE FIGHTING MEASURES

- FLASH POINT: -306 °F
AUTO-IGNITION TEMPERATURE: 999°F or 537°C
FIRE AND EXPLOSION HAZARDS: Forms explosive mixtures with air or oxygen. Hazard of re-ignition or explosion exists if flame is extinguished without stopping the flow of gas or cooling the surroundings. Burns with a pale, faintly luminous flame; air containing more than 14% methane burns without noise.
UPPER EXPLOSIVE / FIRE LIMITS: 15%
LOWER EXPLOSIVE / FIRE LIMITS: 5%
EXTINGUISHING MEDIA: Water fog, foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES: Stop discharge if possible. Keep people away. Shut off ignition sources and call fire department. Because of the danger of re-ignition and possible explosion a gas fire should not usually be extinguished until surroundings have been cooled and the supply of gas has been controlled and can be shut off.
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6. ACCIDENTAL RELEASE MEASURES

- SPILL OR LEAK PROCEDURES: Storage and use areas should be monitored for leakage of methane, since methane (unless odorized) may not give adequate warnings of its dangerous presence in the atmosphere. It is lighter than air and presents hazards similar to hydrogen with regard to its ignitability. In the absence of appropriate monitors, localized leaks may be difficult to detect unless the gas is odorized. Therefore, periodic checks should be made of connections and joints, flanges, and components subject to leakage. Once a leak is found, shut-off the source of gas and lower the pressure in the system to minimize the leak. If uncontrolled leakage is encountered which cannot be stopped by shutting off the closest appropriate valve or main supply valve (without risk), implement a plan for evacuation and quickly contact the local fire department.
SMALL SPILL:
LARGE SPILL:

NEUTRALIZING CHEMICAL: None known

7. HANDLING AND STORAGE

STORAGE TEMPERATURE:

SHELF LIFE: Not applicable

SPECIAL SENSITIVITY:

HANDLING / STORAGE

PRECAUTIONS:

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

RECOMMENDED WORK / HYGIENE PROCEDURES: Good ventilation will prevent formation of harmful concentration in normal workplaces. Keep sparks, flames, and other sources of ignition away.

Attempt to stop leak if can be done without undue personnel hazard. Use water spray to knock down vapors. If material is leaking but not yet on fire, evacuate the downwind area immediately. Avoid breathing the vapors. Keep upwind.

EYE PROTECTION REQUIREMENTS: Protect eyes from liquefied gas, may cause frostbite type injury.

HAND PROTECTION REQUIREMENTS: Not normally required. Contact with liquefied gas may cause frostbite type injury.

PROTECTIVE CLOTHING REQUIREMENTS: Use protective clothing if exposed to liquefied natural gas.

RESPIRATORY REQUIREMENTS: Self-contained breathing apparatus for high concentrations. Please note: If you have an asphyxiant hazard, you have a bigger explosion hazard.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Methane is a colorless, odorless, tasteless, flammable gas

ODOR: Mild, sweet. Odor threshold 200 PPM

PHYSICAL STATE: Flammable Gas

pH: Not applicable

VAPOR DENSITY: 0.416/0.55 Air = 1

VAPOR PRESSURE: Very high

MELTING POINT: -296.5°F or -182.5°C

BOILING POINT: -258.52°F or -161.4°C

SPECIFIC GRAVITY: 0.422at -160°C(liquid)

EVAPORATION RATE: Not applicable

PERCENT VOLATILES: 100

BULK DENSITY: 0.7168 grams/liter

SOLUBILITY IN WATER: Slightly

SOLVENT SOLUBILITY: Methane is soluble in alcohol or ether

MOLECULAR WEIGHT: 16.04

10. STABILITY AND REACTIVITY

INSTABILITY CONDITIONS:

INCOMPATIBILITIES: Reacts violently with powerful oxidizers (e.g. bromine pentafluoride, chlorine trifluoride, chlorine, fluorine, iodine heptafluoride, dioxygenyl tetrafluoroborate, dioxygen difluoride, trioxygen difluoride, liquid oxygen.

DECOMPOSITION

PRODUCTS:

HAZARDOUS Will not occur

POLYMERIZATION:

11. TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY:

EFFECTS OF ACUTE EXPOSURE: High concentrations may cause asphyxiation. No systemic effects, even at 5% concentration in air.

SYMPTOMS OF EXPOSURE:

EYE EFFECTS:

SKIN EFFECTS:

ACUTE ORAL EFFECTS:

ACUTE INHALATION EFFECTS: High concentrations may cause asphyxiation. No systemic effects, even at 5% concentration in air.

CHRONIC EFFECTS/

CARCINOGENICITY:

12. ECOLOGICAL INFORMATION

Not harmful to aquatic life. The utilization of methane by some bacteria cultures, such as *Methylococcus* and others, as a carbon source suggests that methane is biodegradable.

13. DISPOSAL CONSIDERATIONS

Disposal of methane, as with other flammable gases, should be undertaken only by personnel familiar with the gas and procedures for disposal. In general, the best procedure for disposal of flammable gases, including methane, is to burn the gas using a flare system.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Flammable Gas, N.O.S. (Methane and Hydrogen)

D.O.T. HAZARD CLASS: 2

U.N. NUMBER:

D.O.T. PLACARD: Flammable Gas

D.O.T. LABEL CODE:

D.O.T. REPORTABLE QUANTITY:

15. REGULATORY REQUIREMENTS

EPA DETERMINATIONS

CERCLA, 40 CFR 302

The material contains the following hazardous substance which, when released in quantities equal to or exceeding the Reportable Quantity, triggers National Response Center notification requirements.

Hazardous Substance

Reportable Quantity

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986,
TITLE III - SECTIONS 302, 304, 311, 312, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements
(40 CFR 370)

The material should be reported under the following EPA Hazard categories.

- Immediate (Acute Health Hazard)
- Delayed (Chronic Health Hazard)
- Fire
- Sudden Release of Pressure
- Reactive

TOXIC SUBSTANCES CONTROL ACT (TSCA) (40 CFR 710)

The chemical ingredients in this material are in the Section 8(b) Chemical Substance Inventory (40 CFR 710) and/or are otherwise in compliance with TSCA

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of toxic Chemicals and is subject to toxic chemical release reporting requirements.

Toxic Chemical:

CAS Registry Number:

Approximate Concentration (Upper Bound):

LIABILITY DISCLAIMER

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.

Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.