DAKOTA GASIFICATION COMPANY
420 Country Road 26
Beulah, ND 58523-9400
PHONE: 701/873-6857
FAX: 701/873-6875

SAFETY DATA SHEET

RESPONSIBLE CARE®
OUR COMMITMENT TO SUSTAINABILITY

Section 1: Identification

Product identifier

Product Name • **Synthetic Natural Gas**

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Fuel for combustion applications, raw material for chemical reactions

Details of the supplier of the safety data sheet

Manufacturer • Dakota Gasification
420 County Road 26
Beulah, ND 58523-9400
United States
www.dakotagas.com

Telephone (General) • 701-873-2100

Emergency telephone number

Manufacturer • (701) 873-6600

Manufacturer • 800-424-9300 - CHEMTREC

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Flammable Gases 1 - H220
Compressed Gas - H280
Simple Asphyxiant

Label elements

OSHA HCS 2012

DANGER

Hazard statements • Extremely flammable gas - H220
Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.

Precautionary statements

Prevention • Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210

Response • Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377
Eliminate all ignition sources if safe to do so. - P381

Storage/Disposal • Protect from sunlight. Store in a well-ventilated place. - P410+P403

Other hazards

OSHA HCS 2012 • Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

Classification of the substance or mixture

WHMIS • Compressed Gas - A
Flammable Gases - B1

Label elements

WHMIS

• Compressed Gas - A
Flammable Gases - B1

Other hazards

WHMIS • This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

Substances

• Material does not meet the criteria of a substance.

Mixtures

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Methane	**CAS:**74-82-8	95%	NDA	**OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.; Simp. Asphyx.	NDA
Hydrogen	**CAS:**1333-74-0	3.1%	NDA	**OSHA HCS 2012:** Flam. Gas 1;, Press. Gas - Comp.; Simp. Asphyx.	NDA
Carbon dioxide	**CAS:**124-38-9	1.1%	Inhalation-Rat LC50 • 470000 ppm 30 Minute(s)	**OSHA HCS 2012:** Press. Gas - Comp.; Simp. Asphyx.	NDA

Section 4: First-Aid Measures

Description of first aid measures

Inhalation
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin
- IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion
- Ingestion is not anticipated to be a likely route of exposure to this product.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Other information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media
- SMALL FIRES: Dry chemical or CO_2.
  LARGE FIRES: Water spray or fog.

Unsuitable Extinguishing Media
- No data available

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- EXTREMELY FLAMMABLE
  Will form explosive mixtures with air.
  Vapors may travel to source of ignition and flash back.
  Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
  Containers may explode when heated.
  Ruptured cylinders may rocket.
  Burns with a pale, faintly luminous flame; air containing more than 14% methane burns without noise.

Hazardous Combustion Products
- No data available

Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED
  Move containers from fire area if you can do it without risk.
  FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
  FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.
  FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
  FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
  FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
  FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.
  FIRE INVOLVING TANKS: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not walk through spilled material. Ventilate the area before entry.

Emergency Procedures

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile) 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.

Environmental precautions

- Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods and material for containment and cleaning up

Containment/Clean-up Measures

- All equipment used when handling the product must be grounded.
  Stop leak if you can do it without risk.
  If possible, turn leaking containers so that gas escapes rather than liquid.
  Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
  Do not direct water at spill or source of leak.
  Isolate area until gas has dispersed.

Section 7 - Handling and Storage

Precautions for safe handling

Handling

- Keep away from heat and ignition sources – No Smoking. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. Use only non-sparking tools. Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of

dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Use explosion-proof - electrical, ventilating and/or lighting equipment. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

Conditions for safe storage, including any incompatibilities

Storage

- Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52C (125F). Cylinders must be protected from the environment, and preferably kept at room temperature approximately 21C (70F). Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Store locked up.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines				
	Result	**ACGIH**	**NIOSH**	**OSHA**
Carbon dioxide (124-38-9)	TWAs	5000 ppm TWA	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA; 9000 mg/m3 TWA
	STELs	30000 ppm STEL	30000 ppm STEL; 54000 mg/m3 STEL	Not established
Methane (74-82-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	Not established	Not established

Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof - electrical, ventilating and/or lighting equipment.

Personal Protective Equipment

Respiratory

- Follow the OSHA respirator regulations found in 29 CFR 1910.134 Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety glasses.

Skin/Body

- Wear leather gloves when handling cylinders.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
STEL = Short Term Exposure Limits are based on 15-minute exposures
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description

Physical Form	Gas	Appearance/Description	Colorless gas with a mild sweet odor.
Color	Colorless	Odor	Mild, sweet.
Odor Threshold	200 ppm		
General Properties			
Boiling Point	-258.52 F(-161.4 C)	Melting Point	-296.5 F(-182.5 C)
Decomposition Temperature	No data available	pH	Not relevant
Specific Gravity/Relative Density	0.422 Water=1 @ -160 C(-256 F) (liquid)	Bulk Density	No data available
Water Solubility	Slightly Soluble	Viscosity	No data available
Explosive Properties	No data available	Oxidizing Properties:	No data available
Volatility			
Vapor Pressure	Very high	Vapor Density	0.416 to 0.55 Air=1
Evaporation Rate	No data available	Volatiles (Vol.)	100 %
Flammability			
Flash Point	-306 F(-187.7778 C)	UEL	15 %
LEL	5 %	Autoignition	999 F(537.2222 C)
Flammability (solid, gas)	Flammable Gas.		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- No dangerous reaction known under conditions of normal use.

Chemical stability

- Stable

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Incompatible materials. Avoid contact with heat and ignition sources. Excess heat.

Incompatible materials

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

Hazardous decomposition products

- No data available

Section 11 - Toxicological Information

Information on toxicological effects

Components		
Methane (95%)	74-82-8	**Acute Toxicity:** Inhalation-Mouse LC50 • 326 g/m³ 2 Hour(s)
Carbon dioxide	124-38-9	**Acute Toxicity:** Inhalation-Rat LC50 • 470000 ppm 30 Minute(s); Inhalation-Human TCLo • 7 pph; *Behavioral*:**Irritability**; *Brain and Coverings*:**Other degenerative changes**; *Nutritional and Gross Metabolic:Changes in*

(1.1%)		*Chemistry or Temperature*:**Body temperature decrease**; **Reproductive:** Inhalation-Rat TCLo • 6 pph 24 Hour(s)(10D preg); *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**; *Reproductive Effects:Specific Developmental Abnormalities*:**Cardiovascular (circulatory) system**; *Reproductive Effects:Specific Developmental Abnormalities*:**Respiratory system**

GHS Properties	Classification
Acute toxicity	**OSHA HCS 2012**•Data lacking
Aspiration Hazard	**OSHA HCS 2012**•Data lacking
Carcinogenicity	**OSHA HCS 2012**•Data lacking
Germ Cell Mutagenicity	**OSHA HCS 2012**•Data lacking
Skin corrosion/Irritation	**OSHA HCS 2012**•Data lacking
Skin sensitization	**OSHA HCS 2012**•Data lacking
STOT-RE	**OSHA HCS 2012**•Data lacking
STOT-SE	**OSHA HCS 2012**•Data lacking
Toxicity for Reproduction	**OSHA HCS 2012**•Data lacking
Respiratory sensitization	**OSHA HCS 2012**•Data lacking
Serious eye damage/Irritation	**OSHA HCS 2012**•Data lacking

Potential Health Effects

Inhalation

Acute (Immediate)
- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed)
- No data available

Skin

Acute (Immediate)
- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)
- No data available

Eye

Acute (Immediate)
- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)
- No data available

Ingestion

Acute (Immediate)
- Under normal conditions of use, no health effects are expected.

Chronic
- No data available

(Delayed)

Key to abbreviations
LC = Lethal Concentration
TC = Toxic Concentration

Section 12 - Ecological Information

Toxicity

- Material data lacking.

Persistence and degradability

- Material data lacking.

Bioaccumulative potential

- Material data lacking.

Mobility in Soil

- Material data lacking.

Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been conducted for this material.

Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Environmental hazards
DOT	UN1954	Compressed gas, flammable, n.o.s. (Methane and Hydrogen)	2.1	NDA	NDA
TDG	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.(Methane and Hydrogen)	2.1	NDA	Potential Marine Pollutant
IATA/ICAO	UN1954	Compressed gas, flammable, n.o.s. (Methane and Hydrogen)	2.1	NDA	NDA

Special precautions for user
- Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Transport in bulk
- No data available

according to Annex II of MARPOL 73/78 and the IBC Code

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications

- Acute, Fire, Pressure(Sudden Release of)

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**EU EINECS**	**EU ELNICS**	**Korea KECL**
Carbon dioxide	124-38-9	Yes	No	Yes	No	Yes
Hydrogen	1333-74-0	Yes	No	Yes	No	Yes
Methane	74-82-8	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Hydrogen	1333-74-0	A, B1
•Carbon dioxide	124-38-9	A; Uncontrolled product according to WHMIS classification criteria (solid)
•Methane	74-82-8	A, B1

Canada - WHMIS - Ingredient Disclosure List

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	1 %
•Methane	74-82-8	Not Listed

Environment

Canada - CEPA - Priority Substances List

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

Inventory - United States - Section 8(b) Inventory (TSCA) - PMN Number to EPA Accession Number Link

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

Section 16 - Other Information

Last Revision Date • 01/October/2014

Preparation Date • 01/October/2014

Disclaimer/Statement of Liability

- The information contained in this Safety Data Sheet (SDS) 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.

Key to abbreviations

NDA = No data available