

SAFETY DATA SHEET

Classified in accordance with Health Canada Hazardous Products Regulations (SOR/2015-17)

1. Identification

Product identifier: Carbon Dioxide Gas**Other means of identification****Common name(s),** CO₂, Carbonic acid anhydride, carbonic acid gas, acid gas**synonym(s):****SDS number:** NOVA-0026**Recommended use and restriction on use****Recommended use:** Petrochemical industry, enhanced oil recovery, fire suppressant.**Restrictions on use:** All uses other than the identified.**Manufacturer/Importer/Supplier/Distributor Information****Manufacturer**

Company Name: NOVA Chemicals
Address: P.O. Box 2518, Station M
Calgary, Alberta, Canada T2P 5C6
Telephone: Product Information: 1-412-490-4063
SDS Information Email: msdsemail@novachem.com

Emergency telephone number:

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)

1-800-424-9300 (CHEMTREC) (24 hours)

2. Hazard(s) identification

Hazard Classification According to Hazardous Products Regulations**Physical Hazards**

Gases under pressure	Compressed gas
Simple asphyxiant	Category 1

Health Hazards

Specific Target Organ Toxicity - Single Exposure	Category 3
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Environmental Hazards

Acute hazards to the aquatic environment	Category 3
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Label Elements**Hazard Symbol:****Signal Word:**

Warning

Hazard Statement: Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.
May cause drowsiness or dizziness.
Harmful to aquatic life.

Precautionary Statements:

Prevention: Keep container tightly closed. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Avoid release to the environment.

Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE if you feel unwell.

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

Disposal: Dispose of contents and container in accordance with local regulations.

Other hazards which do not result in GHS classification: Contains hydrogen sulphide. At 100 ppm is immediately dangerous to life or health (IDLH) (US. NIOSH).

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%) [*]
Carbon dioxide	Carbonic acid gas	124-38-9	93 - 98%
Ethane	Methylmethane	74-84-0	1 - 2%
Propane	Dimethylmethane	74-98-6	0.1 - 1%
n-Butane	Butane	106-97-8	0.1 - 1%
Hydrogen sulphide	Dihydrogen sulfide	7783-06-4	<=0.07%

^{*} All concentrations are percent by weight.

Additional Information: This product is considered hazardous by the Hazardous Products Regulations.

4. First-aid measures

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE if you feel unwell.

Ingestion: Ingestion of this product is not a likely route of exposure. Do NOT induce vomiting. Seek medical attention.

Skin Contact: IF ON SKIN: Gently wash with plenty of soap and water.

Eye contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention.

Most important symptoms/effects, acute and delayed

Symptoms: High concentrations reduce available oxygen levels and may cause headache, dizziness, nausea, loss of coordination, difficulty breathing, suffocation, or cardiac rhythm disturbance.

Indication of immediate medical attention and special treatment needed

Treatment: Administer oxygen by mask if there is respiratory distress, any change in level of consciousness, or cardiac rhythm disturbance. Treat unconsciousness, nausea, hypotension, seizures and cardiac rhythm disturbance in the conventional manner.

5. Fire-fighting measures

General Fire Hazards: This product is not flammable. Product does not burn. If tank, rail car or tank truck is involved in fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: In case of fire in the surroundings: use appropriate extinguishing media.

Unsuitable extinguishing media: not applicable

Specific hazards arising from the chemical: Product can accumulate in low or confined areas creating a hazardous low oxygen atmosphere, and possible exposures to toxic hydrogen sulphide gas. If exposed to high heat, pressurized pipelines and vessels may rupture due to thermal expansion of gas. This product will produce carbon monoxide, and trace sulphur oxides / sulphur dioxide when heated to temperatures above 1649 °C (3002 °F).

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures: None. Reference Emergency Response Guidebook No. 120 for additional details and instructions.

Special protective equipment for fire-fighters: Wear positive pressure self-contained breathing apparatus (SCBA).

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Wear appropriate personal protective equipment. Isolate area. Keep unauthorized personnel away.

Methods and material for containment and cleaning up: Do not touch or walk through spilled material. Keep out of low areas. Stop leak if safe to do so. Provide adequate ventilation. Isolate area until gas has dispersed. Isolate spill or leak area for at least 100 metres (330 feet) in all directions. All equipment used when handling the product must be grounded. Check oxygen, carbon dioxide and hydrogen sulphide levels prior to approaching the gas release site or prior to entering nearby confined spaces or buildings.

7. Handling and storage

Precautions for safe handling: Keep away from heat. Keep container tightly closed. Ground and bond container and receiving equipment. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Post hydrogen sulphide and other warning signs. Check air levels of oxygen and hydrogen sulphide prior to entering confined spaces or buildings. Avoid release to the environment.

Conditions for safe storage, Store in a well-ventilated place. Keep container tightly closed. Store locked
SDS_CA

including any incompatibilities:

up. Protect from sunlight. Only allow access to authorized persons. Store and handle in properly designed pressure vessels and equipment. Store and use away from heat. Store away from incompatible materials. Store according to applicable regulations and standards for compressed materials. Keep cylinders secure while in storage or in transportation.

8. Exposure controls/personal protection**Control Parameters****Occupational Exposure Limits**

In the ACGIH TLVs® and BEIs® book, ethane (CAS# 74-84-0), propane (CAS# 74-98-6) and n-butane (CAS # 106-97-8) have been identified as being an "Explosion hazard". Ethane (CAS# 74-84-0) and propane (CAS# 74-98-6) have also been identified as a "Simple asphyxiant". Please refer to the ACGIH TLVs® and BEIs® book, latest edition, for additional information.

Chemical Identity	type	Exposure Limit Values		Source
Carbon dioxide	STEL	30,000 ppm	54,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	5,000 ppm	9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Carbon dioxide	TWA	5,000 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
	STEL	15,000 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Carbon dioxide	STEL	30,000 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	5,000 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Carbon dioxide	STEL	30,000 ppm	54,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
	TWA	5,000 ppm	9,000 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Carbon dioxide	TWA	5,000 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	30,000 ppm		US. ACGIH Threshold Limit Values, as amended
Carbon dioxide	STEL	30,000 ppm	54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
	REL	5,000 ppm	9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Carbon dioxide	IDLH	40,000 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Ethane	TWA	1,000 ppm		Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Propane	TWA	1,000 ppm		Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	1,000 ppm	1,800 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Propane	REL	1,000 ppm	1,800 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Propane	IDLH	2,100 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
n-Butane	TWA	1,000 ppm		Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended

n-Butane	STEL	1,000 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
n-Butane	TWA	800 ppm	1,900 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
n-Butane	STEL	1,000 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
n-Butane	STEL	1,000 ppm		US. ACGIH Threshold Limit Values, as amended
n-Butane	REL	800 ppm	1,900 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
n-Butane	IDLH	1,600 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Hydrogen sulphide	CEILING	10 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Hydrogen sulphide	TWA	10 ppm	14 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	CEILING	15 ppm	21 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Hydrogen sulphide	STEL	15 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	10 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Hydrogen sulphide	TWA	8 ppm		Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Hydrogen sulphide	Ceil_Time	10 ppm	15 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Hydrogen sulphide	TWA	1 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	5 ppm		US. ACGIH Threshold Limit Values, as amended
Hydrogen sulphide	IDLH	100 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Appropriate Engineering Controls

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

Individual protection measures, such as personal protective equipment (PPE)

General information:

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Eye/face protection:

Safety glasses. Chemical goggles under a full-face shield are recommended when handling carbon dioxide under pressure.

Skin Protection

Hand Protection:

Chemical resistant gloves.

Skin and Body Protection:	Wear appropriate clothing to prevent any possibility of skin contact. Wear work clothes with long sleeves and pants.
Respiratory Protection:	Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators or IDLH levels.
Hygiene measures:	Use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

9. Physical and chemical properties

Appearance

Physical state:	Gas
Form:	Compressed gas
Colour:	Colourless
Odour:	Odourless, If H ₂ S is present, gas would have an unpleasant, "rotten egg" smell.
Odour Threshold:	0.001 - 0.13 ppm (if H ₂ S present) (detection) (loss of ability to smell H ₂ S begins at 50 ppm; sense of smell deadened above 100 ppm H ₂ S)
Melting point/freezing point:	-78 °C (-108 °F) (sublimation)
Initial boiling point and boiling range:	not applicable
Flammability:	This product is not flammable.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	not applicable
Flammability limit - lower(%):	not applicable
Flash Point:	not applicable
Auto-ignition temperature:	not applicable
Decomposition temperature:	> 1,649 °C (> 3,000 °F)
pH:	3.7 (forms carbonic acid in saturated aqueous solution)
Kinematic viscosity:	not applicable
Solubility(ies)	
Solubility in water:	Slightly soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	0.83 (experimental) Log P(oct)
Vapour pressure:	3,485 kPa (0 °C (32 °F))
Evaporation rate:	not applicable
Density:	not applicable
Relative density:	0.76 (20 °C (68 °F))
Vapour density:	1.52 (15 °C (59 °F)) (Air=1)
Particle characteristics	
Particle Size:	No data available.
Other information	
Explosive properties:	No data available.

10. Stability and reactivity

Reactivity:	No data available.
Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	No data available.
Conditions to Avoid:	Keep away from heat.
Incompatible Materials:	Hydrogen sulphide is a strong reducing agent and is highly reactive. It can rapidly corrode metals and should not be in contact with metal oxides and strong oxidants. Carefully select and test equipment, gaskets and hoses periodically to ensure integrity and compatibility.
Hazardous Decomposition Products:	Upon decomposition, this product will produce carbon monoxide, and trace sulphur oxides/sulphur dioxide.

11. Toxicological information**Information on likely routes of exposure**

Inhalation:	May displace oxygen and cause rapid suffocation. A high concentration of CO ₂ can displace oxygen in the air and can be acutely toxic. Excessive inhalation of product causes headache, dizziness, nausea, loss of coordination and may trigger heartbeat irregularities.
Ingestion:	Ingestion of this product is not a likely route of exposure.
Skin Contact:	Carbon dioxide gas is not a skin irritant.
Eye contact:	Carbon dioxide gas may cause mild eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	Headache, dizziness, nausea, confusion, loss of smell. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
Ingestion:	No adverse effects due to ingestion are expected.
Skin Contact:	Not irritating.
Eye contact:	May cause mild eye irritation.

Information on toxicological effects**Acute toxicity (list all possible routes of exposure)**

Oral Product:	Not classified for acute toxicity based on available data.
Dermal Product:	Not classified for acute toxicity based on available data.
Inhalation Product:	Not classified for acute toxicity based on available data.

Repeated dose toxicity Product:	No data available.
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Skin Corrosion/Irritation**Product:** Not irritating**Serious Eye Damage/Eye Irritation****Product:** Mildly Irritating**Respiratory or Skin Sensitization****Product:** No data available.**Carcinogenicity****Product:** No data available.**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

ACGIH Carcinogen List:

No carcinogenic components identified

Germ Cell Mutagenicity**In vitro****Product:** There are no known or reported genetic effects.**In vivo****Product:** There are no known or reported genetic effects.**Reproductive toxicity****Product:** There are no known or reported reproductive effects.**Specific Target Organ Toxicity - Single Exposure****Product:** May cause drowsiness or dizziness.**Specific Target Organ Toxicity - Repeated Exposure****Product:** No data available.**Aspiration Hazard****Product:** Not classified.**Other effects:**

No data available.

12. Ecological information**Ecotoxicity:****Acute hazards to the aquatic environment:****Fish****Product:** Harmful to aquatic life.**Aquatic Invertebrates****Product:** Harmful to aquatic life.**Toxicity to aquatic plants****Product:** Harmful to aquatic life.

Chronic hazards to the aquatic environment:**Fish****Product:** No data available.**Aquatic Invertebrates****Product:** No data available.**Toxicity to aquatic plants****Product:** No data available.**Persistence and Degradability****Biodegradation****Product:** No data available.**BOD/COD Ratio****Product:** No data available.**Bioaccumulative Potential****Bioconcentration Factor (BCF)****Product:** Will not bio-accumulate.**Partition Coefficient n-octanol / water (log Kow)****Product:** 0.83 (experimental) Log P(oct)**Mobility in Soil:** not applicable**Other Adverse Effects:** No data available.**13. Disposal considerations****Disposal instructions:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.**Contaminated Packaging:** Check local, federal and provincial environmental regulations prior to disposal.**14. Transport information****TDG**

UN number or ID number:	UN 1013
UN Proper Shipping Name:	CARBON DIOXIDE, mixture
Class	2.2
Packing Group	–
Label(s)	2.2
Special precautions for user:	Emergency Response Guidebook No. 120.

15. Regulatory information**Canada Federal Regulations****List of Toxic Substances (CEPA, Schedule 1)****Chemical Identity**

Carbon dioxide

Name on List:

Carbon dioxide

Export Control List (CEPA 1999, Schedule 3)

Not regulated

Greenhouse Gases**Chemical Identity**

Carbon dioxide

Name on List:

Carbon dioxide

Precursor Control Regulations

Not regulated

Canada. Substances Subject to Significant New Activity (SNAc) Reporting Requirements

Not regulated

Inventory status

Canada DSL Inventory List: On or in compliance with the inventory

US TSCA Inventory: On or in compliance with the inventory

16. Other information, including date of preparation or last revision**Issue Date:** 03/12/2025**Revision Information:** 03/12/2025: SDS Update – phrase edits
05/01/2024: SDS Update – Emergency response telephone number updated, OEL updates, section 11 updates, section 15 updates
02/14/2020: SDS Update**Version #:** 7.2**Abbreviations and acronyms:** ACGIH = American Conference of Governmental Industrial Hygienists; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; COD = Chemical Oxygen Demand; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EPA = Environmental Protection Agency; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IDLH = Immediately Dangerous to Life or Health; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; REL = Recommended Exposure Limit; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average**Further Information:** For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".**Disclaimer:** ALTHOUGH THE INFORMATION CONTAINED IN THIS DOCUMENT IS PRESENTED IN GOOD FAITH, BASED ON AVAILABLE INFORMATION BELIEVED TO BE RELIABLE AT THE TIME OF PREPARATION OF THIS DOCUMENT, **NOVA CHEMICALS MAKES NO WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION OR THE PRODUCT/MATERIALS DESCRIBED HEREIN, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES AND CONDITIONS (INCLUDING ALL WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE). NO FREEDOM FROM INFRINGEMENT OF ANY PATENT OWNED BY NOVA CHEMICALS OR OTHERS IS TO BE INFERRED. THIS INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE CONTACT NOVA CHEMICALS FOR THE MOST CURRENT VERSION OF THIS SDS. NOVA CHEMICALS DOES NOT ASSUME RESPONSIBILITY FOR SDS OBTAINED FROM THIRD PARTY SOURCES.****UNLESS SPECIFICALLY AGREED OTHERWISE, NOVA CHEMICALS DOES NOT TAKE**

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