SIGMA-ALDRICH

Material Safety Data Sheet

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Section 1 - Product and Company Information

Product Name Ethylene, 99.5+%
Product Number 295329
Brand Aldrich Chemical

Company Sigma-Aldrich
Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS, MO 63103 US
Technical Phone: 800-325-5832 **Emergency Phone:** 314-776-6555
Fax: 800-325-5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
ETHYLENE	74-85-1	Yes	200-815-3	601-010-00-3

Formula C2H4
Synonyms Acetene, Athylen (German), Bicarburretted hydrogen, Elayl, Ethene, Ethylene (ACGIH:OSHA), Liquid ethyene, Olefiant gas

Section 3 - Hazards Identification

Emergency Overview
Flammable (USA) Extremely Flammable (EU).
Vapors may cause drowsiness and dizziness.
Extremely flammable gas under pressure. Target organ(s): Central nervous system.

HMIS Rating
Health: 1* Flammability: 4 Reactivity: 2

NFPA Rating
Health: 1 Flammability: 4 Reactivity: 2

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure
In case of contact, immediately wash skin with soap and copious amounts of water.

Eye Exposure
Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water. Assure adequate flushing of the eyes by separating the eyelids with fingers.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes

Explosion Hazards
May form explosive mixtures with air
Vapor may travel considerable distance to source of ignition and flash back.
Container explosion may occur under fire conditions.

Flash Point: -148 °F -100 °C

Explosion Limits: **Lower:** 2.7 % **Upper:** 36 %

Autoignition Temp: 450 °C **Flammability:** Yes

Extinguishing Media
Suitable
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Firefighting
Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s)
Extremely flammable. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.
Specific Method(s) of Fire Fighting
Do not extinguish burning gas if flow cannot be shut off immediately. Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area and keep personnel upwind. Shut off all sources of ignition. Shut off leak if there is no risk.

Procedure(s) of Personal Precaution(s)
Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.

Methods for Cleaning Up
Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Do not breathe gas. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

Storage
Suitable
Keep tightly closed. Keep away from heat, sparks, and open flame. Cylinder temperature should not exceed 125°F (52°C).
Incompatible Materials
Mixtures of ethylene and aluminum chloride at 3060 bar pressure will rapidly heat and explode in the presence of supported nickel catalysts, methyl chloride or nitromethane. The mixing of ethylene with trifluoromethyl hypofluorite in the absence of a diluent results in an explosion. Reaction with chlorine, ozone or nitrogen oxide is explosive. When ethylene is passed over heated lithium incandescence occurs and produces a mixture of lithium hydride and lithium acetylide. When 5A molecular sieves were used to dry a compressed ethylene gas stream, an exothermic reaction took place and caused an explosion. Smaller 3A molecular sieves are not catalytically active toward ethylene

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Special Requirements
Contents under pressure.

Section 8 - Exposure Controls / PPE

Engineering Controls
Mechanical exhaust required.Safety shower and eye bath.Warning: suck-back into cylinder may cause rupture. Use backflow-preventive device in piping.

Work Practices
Store and use with adequate ventilation.

Personal Protective Equipment
Respiratory
Use respirators and components tested and approved under appropriate government standardssuch as NIOSH (US) or CEN (EU).Where risk assessment shows air-purifying respirators are appropriate use a fullface respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If therespirator is the sole means of protection, use a fullface supplied air respirator.
Hand
Compatible chemical-resistant gloves.
Eye
Chemical safety goggles.

General Hygiene Measures
Wash contaminated clothing before reuse.Wash thoroughly after handling.

Exposure Limits, RTECS

Country	Source
USA	ACGIH
USA	MSHA Standard
Remarks: Asphyxiants/Gases.	
New Zealand	OEL
Remarks: check ACGIH TLV	

Section 9 - Physical/Chemical Properties

Appearance
Physical State
Compressed gas

Molecular Weight 28.05 AMU

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	-104 °C	760 mmHg
MP/MP Range	-169 °C	
Freezing Point	N/A	
Vapor Pressure	26630.4 mmHg	20 °C
Vapor Density	0.97 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	

Flash Point °F	-148 °F	Method: closed cup
Flash Point °C	-100 °C	Method: closed cup
Explosion Limits	Lower: 2.7 % Upper: 36 %	
Flammability	N/A	
Autoignition Temp	450 °C	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

Stability
Materials to Avoid
Strong oxidizing agents, Carbon tetrachloride, Chlorine, Copper, Vinyl acetate

Hazardous Decomposition Products
Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
May cause skin irritation.
Skin Absorption
May be harmful if absorbed through the skin.
Eye Contact
May cause eye irritation.
Inhalation
May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tractCan cause rapid suffocation.
Ingestion
May be harmful if swallowed.

Target Organ(s) or System(s)
Central nervous system.

Signs and Symptoms of Exposure
Ethylene vapor will act as a simple asphyxiant by displacing the oxygen in the air. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.Exposure can cause: Nausea, dizziness, and headache.Narcotic effect. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: KU5340000

Chronic Exposure- Carcinogen
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC Carcinogen List
Rating
Group 3

ACGIH Carcinogen List
Rating
A4

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Section 12 - Ecological Information

Acute Ecotoxicity Tests
Test Type
LC100 Fish
Time: 24.0 h
Value: 22 - 25 mg/l

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
Contact a licensed professional waste disposal service to dispose of this material.
Appropriate Method of Disposal of Contaminated Packaging
Caution: no-return cylinder. Do not reuse. Empty cylinder will contain hazardous residue. Follow proper disposal techniques.

Section 14 - Transport Information

DOT
Proper Shipping Name: Ethylene, compressed
UN#: 1962
Class: 2.1
Packing Group: None
Hazard Label: Flammable gas
PIH: Not PIH

IATA
Proper Shipping Name: Ethylene, compressed
IATA UN Number: 1962
Hazard Class: 2.1
Not Allowed - Aircraft: Cargo aircraft only. Not permitted on passenger aircraft.

Section 15 - Regulatory Information

EU Directives Classification
Symbol of Danger: F+
Indication of Danger
Extremely Flammable.
Risk Statements **R:** 12 67
Extremely flammable. Vapors may cause drowsiness and dizziness.
Safety Statements **S:** 9 16 33 46
Keep container in a well-ventilated place. Keep away from sources of ignition- no smoking. Take precautionary measures against static discharges. If swallowed, seek medical advice immediately and show this container or label.

US Classification and Label Text
Indication of Danger
Flammable (USA) Extremely Flammable (EU).
Risk Statements
Vapors may cause drowsiness and dizziness.
Safety Statements
Keep container in a well-ventilated place. Keep away from sources of ignition- no smoking. Take precautionary measures against static discharges. If swallowed, seek medical advice immediately and show this container or label.
US Statements
Extremely flammable gas under pressure.Target organ(s): Central nervous system.

United States Regulatory Information
SARA Listed: Yes
Deminimis: 1 %
Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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