

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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SUBSTANCE: ACETYLENE

TRADE NAMES/SYNONYMS:

ETHYNE; WELDING GAS; ACETYLEN; ETHINE; NARCYLEN; VINYLENE; STCC 4905701; UN 1001; C2H2; MGI00280; RTECS AO9600000

CHEMICAL FAMILY: hydrocarbons, aliphatic
CREATION DATE: May 04 1990
REVISION DATE: Sep 16 2002

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: ACETYLENE
CAS NUMBER: 74-86-2
EC NUMBER (EINECS): 200-816-9
EC INDEX NUMBER: 601-015-00-0
PERCENTAGE: >99
OTHER CONTAMINANTS:
TRACES OF AIR, PHOSPHINE, ARSINE, HYDROGEN SULFIDE.

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=4 REACTIVITY=3
EMERGENCY OVERVIEW:
PHYSICAL DESCRIPTION: Colorless gas with ethereal odor when pure, garlic-like odor if impure.
MAJOR HEALTH HAZARDS: central nervous system depression, difficulty breathing
PHYSICAL HAZARDS: May explode when heated. Flammable gas. May cause flash fire.
POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: nausea, vomiting, chest pain, wheezing, headache, symptoms of drunkenness, bluish skin color, suffocation, lung congestion, coma
LONG TERM EXPOSURE: no information on significant adverse effects
SKIN CONTACT:
SHORT TERM EXPOSURE: rash
LONG TERM EXPOSURE: no information is available
EYE CONTACT:
SHORT TERM EXPOSURE: no information on significant adverse effects
LONG TERM EXPOSURE: no information is available
INGESTION:
SHORT TERM EXPOSURE: no information on significant adverse effects
LONG TERM EXPOSURE: no information is available
CARCINOGEN STATUS:
OSHA: No
NTP: No
IARC: No

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash exposed skin with soap and water.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe explosion hazard. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk.

For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Stop flow of gas.

LOWER FLAMMABLE LIMIT: 2.5%

UPPER FLAMMABLE LIMIT: 100%

AUTOIGNITION: 581 F (305 C)

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with current regulations and standards:

OSHA 29 CFR 1910.102. Protect from physical damage. Store outside or in a detached building. Keep separated from incompatible substances. Store in a cool, dry place. Ventilation required. Avoid heat, flames, sparks and other sources of ignition. Secure to prevent tipping.

Cylinder temperature should not exceed 125 F (52 C).

29 CFR Subpart "H"-Hazardous Materials.

National Fire Protection Association publication #55, "Standard for the Storage, Use and Handling of Compressed and Liquefied Gases in Portable Cylinders."

Compressed Gas Association publication P-1, "Safe Handling of Compressed Gases in Containers".

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

ACETYLENE:

ACGIH (simple asphyxiant)

2500 ppm (2662 mg/m³) NIOSH recommended ceiling

UK OES (simple asphyxiant)

MEASUREMENT METHOD: Gas collection bag; Gas chromatography with flame ionization detection; NIOSH Acetylene Criteria Document

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Eye protection not required, but recommended.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Protective gloves are not required, but recommended.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION: Colorless gas with ethereal odor when pure, garlic-like odor if impure.

MOLECULAR WEIGHT: 26.04

MOLECULAR FORMULA: H-C-C-H

BOILING POINT: Not available

FREEZING POINT: Not available

SUBLIMATION POINT: -119 F (-84 C)

VAPOR PRESSURE: 760 mmHg @ -84 C

VAPOR DENSITY (air=1): 0.90

SPECIFIC GRAVITY: Not applicable

DENSITY: 1.1747 g/L @ 0 C

WATER SOLUBILITY: 0.94% @ 25 C

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

VISCOSITY: 0.010 cP @ 20 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SOLVENT SOLUBILITY:

Soluble: acetone, benzene, chloroform, ether

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: May decompose violently on heating. May explode when heated.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition.

Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: metals, halogens, oxidizing materials, metal carbide, reducing agents, halo carbons

ACETYLENE:

BRASS: Forms explosive acetylides.

BROMINE: Explosive reaction.

CALCIUM HYPOCHLORITE: May form explosive chloroacetylides.

CESIUM HYDRIDE: Vigorous reaction in the presence of moisture or above 42 C.

CHLORINE: Explosive reaction.

COBALT: Incandescent decomposition reaction.

COPPER + SALTS: Forms explosive acetylides.

CUPROUS CARBIDE: Explodes if preheated.
FLUORINE: Violent reaction.
IODINE: Explosive reaction.
MERCURIC NITRATE: Forms shock-sensitive acetylides.
MERCURY + SALTS: Forms explosive acetylides.
NITRIC ACID (CONCENTRATED): Forms explosive trinitromethane.
NITROGEN OXIDE: May ignite above 30 C.
OXIDIZERS: Violent or explosive reaction.
OXYGEN: Dangerous explosive reaction.
OZONE: May violently explode.
POTASSIUM (MOLTEN): Ignites, then explodes.
RUBIDIUM HYDRIDE: Vigorous reaction in the presence of moisture.
SILVER + SALTS: Forms explosive acetylides.
SILVER NITRATE: Forms explosive acetylides in ammonia solutions.
SODIUM HYDRIDE: Vigorous reaction in the presence of moisture.
TRIFLUOROMETHYL HYPOFLUORITE: Explosive reaction.
HAZARDOUS DECOMPOSITION:
Thermal decomposition products: oxides of carbon
POLYMERIZATION: Polymerizes with evolution of heat. Avoid contact with curing agents, accelerators, and/or initiators.

SECTION 11 TOXICOLOGICAL INFORMATION

ACETYLENE:

TOXICITY DATA:

20 pph inhalation-human TCLO; 50 pph/5 minute(s) inhalation-human LCLO; 50 pph/5 minute(s) inhalation-mammal LCLO

ACUTE TOXICITY LEVEL: Insufficient Data.

TARGET ORGANS: central nervous system

ADDITIONAL DATA: Stimulants such as epinephrine may induce ventricular fibrillation.

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

ACETYLENE: Pure acetylene at a level of 2.5% in air is reported to be nontoxic. Slight intoxication with reversible narcosis may occur at 10%; marked intoxication with dyspnea, headache, and staggering gait at 20%; loss of coordination at 30%; and loss of consciousness at 33-35% for 5-7 minutes. Complete anesthesia, increased blood pressure, narcosis, and stimulated respiration may occur at concentrations up to 80%. Other reported effects may include mild gastric symptoms, dizziness, mental confusion, emotional instability, hypercapnia, and myocardial sensitization. Asphyxiation may occur by reducing the oxygen concentration in respirable air to low levels. Commercial acetylene often contains impurities which may be responsible for symptoms before the asphyxiant level is reached. Symptoms may include rapid respiration, air hunger, impaired mental alertness, cyanosis, weak and irregular pulse, rapid fatigue, nausea, vomiting, prostration, metabolic acidosis, hyperglycemia, ketonuria, elevated creatinine levels, impairment of judgement and sensation, pulmonary edema, loss of consciousness, coma, and death. A worker who inhaled acetylene gas from a leaking torch developed severe respiratory distress, including diaphragmatic breathing, rhonchi and wheezing, and chest pain. Examination revealed extensive pulmonary edema, bronchopneumonia, and pleural effusion in both lungs. Symptoms were thought to be due to impurities.

CHRONIC EXPOSURE:

ACETYLENE: Exposure during the manufacture of acetylene from calcium carbide produced bronchitis and a stomach ulcer in a worker. Symptoms are believed to have originated from chronic phosphine poisoning. Intermittent exposure for 93 hours to 25% pure acetylene caused slight capillary hyperemia in experimental animals.

SKIN CONTACT:

ACUTE EXPOSURE:

ACETYLENE: No adverse effects have been reported from the pure gas. One case of urticaria has been reported following the use of an oxyacetylene torch in welding. It subsided within 6 hours after cessation of work. Symptoms were believed to result from impurities or combustion products in the gas.

CHRONIC EXPOSURE:

ACETYLENE: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

ACETYLENE: No adverse effects have been reported from the gas.

CHRONIC EXPOSURE:

ACETYLENE: No data available.

INGESTION:

ACUTE EXPOSURE:

ACETYLENE: Ingestion of a gas is not likely.

CHRONIC EXPOSURE:

ACETYLENE: No data available.

SECTION 12 ECOLOGICAL INFORMATION

Not available

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Acetylene, dissolved

ID NUMBER: UN1001

HAZARD CLASS OR DIVISION: 2.1

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Acetylene, dissolved

ID NUMBER: UN1001

CLASSIFICATION: 2.1

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Acetylene, dissolved

UN NUMBER: UN1001

ADR/RID CLASS: 2

CLASSIFICATION CODE: 4F

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Acetylene, dissolved

UN/ID NUMBER: UN1001

IATA/ICAO CLASS: 2.1

MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Acetylene, dissolved

UN NUMBER: UN1001

IMDG CLASS: 2.1

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.
OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (ASSIGNED):

F+ Extremely Flammable

EC Classification may be inconsistent with independently-researched data.

DANGER/HAZARD SYMBOL:

F+ Extremely Flammable

EC RISK AND SAFETY PHRASES:

R 5 Heating may cause an explosion.
R 6 Explosive with or without contact with air.
R 12 Extremely flammable.
S 2 Keep out of reach of children.
S 9 Keep container in a well-ventilated place.
S 16 Keep away from sources of ignition - No smoking.
S 33 Take precautionary measures against static discharges.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

SECTION 16 OTHER INFORMATION

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