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MATERIAL SAFETY DATA SHEET (32)

Welding Consumables
and Related Products
Conforms to OSHA 1910.1200

IDENTIFICATION

PRODUCT NAME: Acetylene

CHEMICAL FAMILY: Alkyne

SYNONYMS: Ethyne

DOT HAZARD CLASS: Flammable gas

CAS NUMBER: 74-86-2

DOT IDENTIFICATION NUMBER: 1001

FORMULA: C_2H_2

CHEMTREC: 800-424-9300

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT:

Acetylene is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg. (ACGIH, 1984-85), no OSHA PEL.

ACETONE: 67-64-1

Acetylene is shipped dissolved in acetone, which comprises approximately 40% of the cylinder weight. Acetone may discharge and burn along with acetylene if the cylinder is stored on its side.

OSHA PEL: 1,000 PPM, ACGIH-TLV: 750 PPM, 1000 PPM (STEL)

SYMPTOMS OF EXPOSURE:

Inhalation: Low concentrations (10-20% in air) cause symptoms similar to that of being intoxicated. Higher concentrations so as to exclude an adequate supply of oxygen to the lungs cause unconsciousness.

TOXICOLOGICAL PROPERTIES:

As a narcotic gas or intoxicant causes hypercapnia (an excessive amount of carbon dioxide in the blood). Repeated exposures to tolerable levels has not shown deleterious effects. The major property is the exclusion of an adequate supply of oxygen to the lungs.

RECOMMENDED FIRST AID TREATMENT:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ACETYLENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Hazardous Mixtures of Other Liquids, Solids, or Gases:

Flammable over an extremely wide range in air. Explosive reactions may occur on ignition. Reacts explosively with halogens and halogenated compounds.

PHYSICAL DATA

Boiling Point: Sublimation Point = -118.8°F (-83.8°C)

Liquid Density @ Boiling Point: @ -116°F (-82°C) = 38.8 lb/ft³ (622 kg/m³)

Vapor Pressure @ 70°F (21.1°C): 645 psia (4450 kPa)

Specific Gravity @ 70°F, 1 atm (Air=1): @ 68°F (20°C) = 0.906

Solubility in Water: Soluble

Freezing Point: -113°F (-80.6°C)

Appearance and Odor: Pure acetylene is a colorless gas with an ethereal odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.

FIRE/EXPLOSION HAZARDS DATA

Flash Point (Method Used): Gas

Auto Ignition Temperature: 565°F (296°C)

LEL: 2.2

UEL: 80-85*

Extinguishing Media: Carbon dioxide; dry chemical

Electrical Classification: Class 1, Group A

Special Fire Fighting Procedures: If possible, stop flow of escaping gas. Use water spray to cool surrounding containers. Keep personnel away since heated or burning cylinders can rupture violently.

Unusual Fire and Explosion Hazards: GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURES ABOVE 15 PSI (207 kPa). It requires a very low ignition energy so that fires which have been extinguished without stopping the flow of gas can easily reignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate.

* Pure acetylene can ignite by decomposition above 15 psi (207 kPa).

Stability: Unstable

Incompatibility (Materials to Avoid): Oxygen and other oxidizers including all of the halogens and halogen compounds. Forms explosive acetylide compounds with copper, mercury, silver, brasses containing more than 66% copper and brazing materials containing silver or copper.

Hazardous Decomposition Products: Carbon monoxide and hydrogen

Hazardous Polymerization: Will not occur

Conditions to Avoid: Do not allow the free gas (outside of cylinder) to exceed 15 psi. Cylinders should not be exposed to sudden shock or sources of heat.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact CHEMTREC for emergency assistance or your closest Airco location.

Waste Disposal Method:

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled and valve protection cap in place to Airco for proper disposal.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

Ventilation: Hood with forced ventilation.

Local Exhaust: To prevent accumulation above the LEL.

Special: N/A

Mechanical (Gen.): In accordance with electrical codes.

Other: N/A

Protective Gloves: PVC or rubber in laboratory; as required for cutting & welding.

Eye Protection: Safety goggles or glasses

Other Protective Equipment: Safety shoes, safety shower

SPECIAL PRECAUTIONS

Special Labeling Information:

DOT Shipping Name: Acetylene
DOT Shipping Label: Flammable gas

DOT Hazard Class: Flammable gas
I.D. No.: UN 1001

Special Handling Recommendations:

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when removing gas from the cylinder. DO NOT ALLOW THE FREE GAS TO EXCEED 15 PSI (207 kPa) @ 70°F (21.1°C). Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional recommendations, consult Compressed Gas Association's Pamphlets G-1 and P-1. NFPA #51-1984. OSHA 1910 - Subparts H & Q

Special Storage Recommendations:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction way from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional recommendations, consult Compressed Gas Association's Pamphlets G-1& P-1. NFPA #51-1984. OSHA 1910 - Subparts H & Q

Special Packaging Recommendations:

Since acetylene will explode or combust if its pressure exceeds 15 psi (207 kPa), it is shipped dissolved in acetone or dimethylformamide, which is dispersed in a porous mass within the cylinder. Follow Airco's instructions for the maximum withdrawal rate for each size cylinder so that solvent is not withdrawn with the acetylene.

Most metals except silver, copper, mercury or brasses with more than 66% copper are compatible (noncorrosive) with acetylene.

Other Recommendations or Precautions:

Earth-ground and bond all lines and equipment associated with the acetylene system. Electrical equipment should be nonsparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipments of a compressed gas cylinder, which has not been filled by the owner or with his (written) consent, is a violation of Federal Law (49CFR).