AIRCO

Material Safety Data Sheet CARBON DIOXIDE, GAS	Page: 1 Rev. Date 08/04/89

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SECTION #1 - IDENTIFICATION

Product: CARBON DIOXIDE, GAS

CAS Number: 124-38-9
Product Code: MSDS CODE G-8
Chemical Family: Carbonate
Chemical Formula: CO2
Molecular Weight: 44.00
RTECS Number: FF64000000

Synonyms: CARBONIC ANHYDRIDE
G-8

Hazard Rating - Health: 1 Slight
- Fire: 0 Negligible
- Reactivity: 0 Negligible
- Other:

SECTION #2 - CHEMICAL COMPONENTS

Component: CARBON DIOXIDE
CAS Number: 124-38-9 Percent of Mixture: 99.8000 to 99.9990
ACGIH TLV-TWA: 5,000 ppm OSHA PEL-TWA: 5000 ppm (Trans.)
ACGIH TLV-STEL: 30,000 ppm OSHA PEL-TWA: 10000 ppm (Final)
IDLH: 50,000 ppm OSHA PEL-STEL: 30000 ppm (Final)

SECTION #3 - PHYSICAL DATA

Boiling Point: sublimes at -109°F and 1 atm. -78.5°C
Vapor Pressure: 856 psia
Vapor Density (Air=1): 1.65 @70°F (Air=1)
Packing Density: 98 lb/ft3
Solubility (H2O): Very soluble

Appearance

A colorless, slightly acidic gas at room temperature and pressure.
It is shipped as a liquified gas under its own vapor pressure.

SECTION #3 - PHYSICAL DATA Continued...

Odor

Odorless

SECTION #4 - FIRE FIGHTING & EXPLOSION DATA

Flash Point: N/A

Lower Explosive Limit (%): None
Upper Explosive Limit (%): None

Fire and Explosion Hazards

Electrical Classification: Non-Hazardous

Use extinguishing media suitable for the combustable materials involved in the fire.

SECTION #5 - EXPOSURE and EFFECTS - INHALATION

Routes of Exposure - Inhalation

Low concentrations (3 to 5 molar %) cause increased respiration and headache. 8 to 15 molar % concentrations cause headache, nausea and vomiting which may lead to unconsciousness if not moved to open air or given oxygen. Higher concentrations cause rapid circulatory insufficiency leading to coma and death. Maintain oxygen levels above 19.5% at sea level.

First Aid - Inhalation

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON DIOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

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. Treat areas exposed to liquid as frostbite. Remove to fresh air, treat symptomatically.

SECTION #5 - MISCELLANEOUS TOXICOLOGICAL INFORMATION

Carbon Dioxide is the most powerful cerebral vasodilator known. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations.

Carcinogenicity: NTP: No IARC: No OSHA: No

SECTION #6 - REACTIVITY & POLYMERIZATION

Stability: Stable

Conditions to Avoid (Stability)

None

Incompatible Materials

Reactive metals (e.g., magnesium & aluminum), hydrides, moist cesium oxide or lithium acetyl may ignite. Mixing with sodium peroxide and reactive metals may explode.

Hazardous Decomposition Products

Carbon Monoxide & Oxygen when heated above 1700°C. Shock sensitive mixtures may form when dry ice is mixed with potassium or sodium-potassium alloy.

Hazardous Polymerization: Will Not Occur

SECTION #7 - SPILL, LEAK, & DISPOSAL PROCEDURES

Steps to be Taken in The Event of Spills, Leaks, or Release

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. Note that carbon dioxide will displace oxygen thus causing possible oxygen deficient atmospheres in confined areas.

Waste Disposal Methods

Do not attempt to dispose of residual or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Airco for proper disposal.

SECTION #7 - SPILL, LEAK, & DISPOSAL PROCEDURES Continued...

SARA Hazard Classes: Acute Health Hazard
Sudden Release of Pressure Hazard

SECTION #8 - SPECIAL PROTECTIVE MEASURES

Ventilation

Local Exhaust: To prevent accumulation above TLV.
Ensure adequate ventilation.

Eye Protection

Safety goggles or glasses

Skin Protection

Protective Gloves of any material

Respiratory Protection

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

Other Protection

Safety shoes

SECTION #9 - SPECIAL PRECAUTIONS - STORAGE & HANDLING

Storage & Handling Conditions

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 connecting cylinder to lower pressure (<3000 psig) piping or systems. 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 system.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the

SECTION #9 - SPECIAL PRECAUTIONS - STORAGE & HANDLING Continued...

Storage & Handling Conditions

temperature where cylinders are stored to exceed 130°F (54°C). Cylinders should 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.

Dry Carbon Dioxide can be handled with most common structural materials. Moist Carbon Dioxide is corrosive by its formation of carbonic acid. For these applications, 316, 309 and 310 stainless steels may be used as well as Hastelloy (R) A, B, & C, and Monel (R). Ferrous Nickel alloys are slightly corroded. At normal temperatures Carbon Dioxide is compatible with most plastics and elastomers.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

SECTION #10 - SHIPPING INFORMATION

Proper Shipping Name: Carbon Dioxide

Hazard Class: Nonflammable Gas
DOT Identification Number: UN1013
DOT Shipping Label: Nonflammable Gas

SECTION #11 - MISC COMMENTS & REFERENCE DOCUMENTATION

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 in violation of Federal Law (49CFR).

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