

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Asia Pacific Gas Enterprise Company Limited
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China
TELEPHONE NUMBER: (86) 757-85115270

SUBSTANCE: CARBON DIOXIDE, GAS

CHEMICAL FAMILY: inorganic, gas

CREATION DATE: Jan 24 1989

REVISION DATE: Sep 13 2018

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CARBON DIOXIDE, GAS

CAS NUMBER: 124-38-9

PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: gas

ODOR: odorless

MAJOR HEALTH HAZARDS: difficulty breathing

PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: changes in blood pressure, ringing in the ears, nausea, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, tingling sensation, tremors, weakness, visual disturbances, suffocation, convulsions, unconsciousness, coma

LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:

SHORT TERM EXPOSURE: blisters, frostbite

LONG TERM EXPOSURE: no information on significant adverse effects

EYE CONTACT:**SHORT TERM EXPOSURE:** frostbite, blurred vision**LONG TERM EXPOSURE:** no information on significant adverse effects**INGESTION:****SHORT TERM EXPOSURE:** ingestion of a gas is unlikely**LONG TERM EXPOSURE:** ingestion of a gas is unlikely

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:** If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.**EYE CONTACT:** Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.**INGESTION:** If a large amount is swallowed, get medical attention.**NOTE TO PHYSICIAN:** For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Containers may rupture or explode if exposed to heat.**EXTINGUISHING MEDIA:** Use extinguishing agents appropriate for surrounding fire.**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Do not get water directly on material. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.**FLASH POINT:** none

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Do not touch spilled material. Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.

7. HANDLING AND STORAGE

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

Protect from

physical damage. Store in a well-ventilated area. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

CARBON DIOXIDE, GAS:

CARBON DIOXIDE:

5000 ppm (9000 mg/m³) OSHA TWA

10000 ppm (18000 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

30000 ppm (54000 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5000 ppm ACGIH TWA

30000 ppm ACGIH STEL

5000 ppm (9000 mg/m³) NIOSH recommended TWA 10 hour(s)

30000 ppm (54000 mg/m³) NIOSH recommended STEL

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear insulated gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

40,000 ppm

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

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

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure demand or other positive-pressure mode.

Escape -

Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas

COLOR: colorless

ODOR: odorless

TASTE: acid taste

MOLECULAR WEIGHT: 44.01

MOLECULAR FORMULA: C-O₂

BOILING POINT: -109.3 to -79 F (-78.50 to -61.7 C) (liquid)

FREEZING POINT: -71 F (-57 C) @ 4000 mmHg

SUBLIMATION POINT: -109.3 F (-78.50 C)

TRIPLE POINT: -70 F (-56.6 C) @ 3883.6 mmHg

VAPOR PRESSURE: 43700 mmHg @ 21 C

VAPOR DENSITY (air=1): 1.5

SPECIFIC GRAVITY (water=1): 1.527 @ 21 C

WATER SOLUBILITY: soluble **PH:**

acidic in solution **VOLATILITY:**

Not applicable **VOLATILITY BY**

VOLUME: 100%

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable **VISCOSITY:**

0.00000203 Pa.s @ 20 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SOLVENT SOLUBILITY:

Soluble: alcohol, acetone, hydrocarbons, organic solvents

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Protect from physical damage and heat. Containers may rupture or explode if exposed to heat. Avoid contact with water or moisture.

INCOMPATIBILITIES: combustible materials, oxidizing materials, metal salts, reducing agents, metal carbide, metals, bases, potassium, sodium, ethyleneimine

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of carbon

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

CARBON DIOXIDE, GAS:

TOXICITY DATA: 470000 ppm/30 minute(s) inhalation-rat LC50

ACUTE TOXICITY LEVEL:

Relatively Non-toxic: inhalation

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart or cardiovascular disorders,

respiratory disorders

REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 150000 ug/L 48 day(s) (Mortality) Brown trout (Salmo trutta)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Carbon dioxide

ID NUMBER: UN1013

HAZARD CLASS OR DIVISION: 2.2

LABELING REQUIREMENTS: 2.2

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Carbon dioxide

UN NUMBER: UN1013

CLASS: 2.2

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: No

REACTIVE: No

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: A.

NATIONAL INVENTORY STATUS:

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

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDL): Listed on DSL.

16. OTHER INFORMATION

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