

Risks and Safety Hazards of Carbon Dioxide

What is Carbon Dioxide?

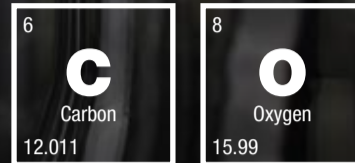
Chemical Compound: CO₂

CAS Number: 124-38-9

Carbon Dioxide is a colorless odourless gas at atmospheric temperatures and pressures. It is soluble in water where it forms carbonic acid, a mild acid. In its solid form it is known as dry ice, it is primarily used for cooling.

Other names: Carbonic acid gas, Carbonic Anhydride, Carbonic Dioxide, Carbon (IV) oxide, R-774 (refrigerant), Dry Ice

Chemical Forms



Chemical Properties

Molecular weight:	44.009 g/mol
Boiling point:	-78.46°C
Melting point:	-56.6°C
Vapour pressure (25°C)	64.4bar(a)
Relative density, gas (air=1)	1.53
Relative density, liquid (water=1)	0.92
Solubility in water (25°C)	1480 mg/l
Gas Colour	colourless

Safety Hazards of Carbon Dioxide



Carbon Dioxide occurs naturally in the atmosphere as part of the Earth's carbon cycle. It is also the most prolific greenhouse gas produced by human activity. Generally, naturally occurring sources are not a hazard to life with the exception of volcanic activity. Industrial use of Carbon Dioxide presents the greatest hazard to people.



Carbon Dioxide is classified as a non-flammable, non-toxic gas. In concentrations of 3% - 5% in the air it causes increased respiration, headaches, and dizziness. At higher concentration it can cause coma and death.



Risk of exposure can occur through:

- Accidental Release
- Leak
- Transportation



Carbon Dioxide can be measured using a gas detector fitted with *electrochemical sensors* or by using indicator stain tubes.

2.2 : Non-flammable, non-toxic gases

Health Risk: Carbon Dioxide Exposure Effects



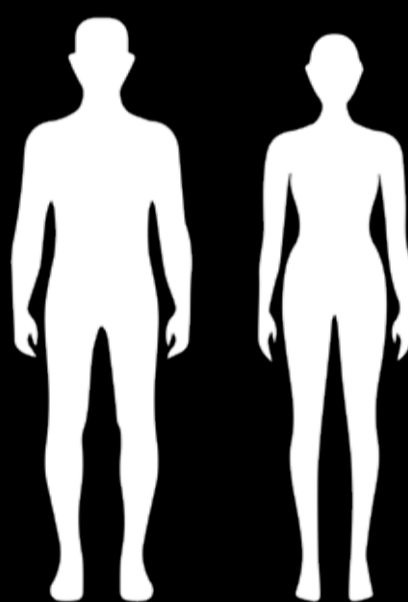
EYES

- Burns
- Irritation
- Permanent damage



STOMACH

Ingestion is not considered a potential route of exposure



HEAD

- Loss of smell
- Dizziness
- Drowsiness



RESPIRATORY SYSTEM

- Increased respiration
- Burning

Working Exposure Limits of Carbon Dioxide

The eight-hour Time-Weighted Average (TWA) recommendations of Safe Work Australia:

TWA concentration can result in irritation to workers.

5,000ppm

Occupational Exposure Standards

	Excursion Limit
8 hr TWA	5,000 ppm
15 min STEL	30,000 ppm
NIOSH IDLH	40,000 ppm