

Chemical Safety Data Sheet MSDS / SDS

Carbon monoxide SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: Carbon monoxide
CAS: 630-08-0

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.
Uses advised against: none

Company Identification

Company: Chemicalbook.in
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SECTION 2: Hazards identification**Classification of the substance or mixture**

Gases under pressure: Compressed gas
Flammable gases, Category 1A, Flammable gas

Acute toxicity - Category 3, Inhalation
Specific target organ toxicity - repeated exposure, Category 1
Reproductive toxicity, Category 1A

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H220 Extremely flammable gas
H331 Toxic if inhaled
H372 Causes damage to organs through prolonged or repeated exposure

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P203 Obtain, read and follow all safety instructions before use.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P319 Get medical help if you feel unwell.
P318 IF exposed or concerned, get medical advice.

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.

P403 Store in a well-ventilated place.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Carbon monoxide
Common names and synonyms:	Carbon monoxide
CAS number:	630-08-0
EC number:	211-128-3
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. See Notes.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Inhalation causes headache, dizziness, weakness of limbs, confusion, nausea, unconsciousness, and finally death. 0.04% conc., 2-3 hr. or .06% conc., 1 hr.- headache and discomfort; with moderate exercise, 0.1-0.2% will produce throbbing in the head in about 1/2 hr., a tendency to stagger in about 1 1/2 hr., and confusion of the mind, headache, and nausea in about 2 hrs. 0.20-25% usually produces unconsciousness in about 1/2 hr. Inhalation of a 0.4% conc. can prove fatal in less than 1 hr. Inhalation of high concentrations can cause sudden, unexpected collapse. Contact of liquid with skin will cause frostbite. (USCG, 1999)
Excerpt from ERG Guide 168 [Carbon Monoxide (Refrigerated Liquid)]: TOXIC; Extremely Hazardous. Inhalation extremely dangerous; may be fatal. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Odorless, will not be detected by sense of smell. (ERG, 2016)

Indication of immediate medical attention and special treatment needed, if necessary

Treatment includes 100% oxygen and, in severe cases, hyperbaric oxygen. The half-life of carboxyhemoglobin is 6 hours at room air, 1.5 hours with 100% oxygen, and 23 minutes at three atmospheres of pressure.

SECTION 5: Firefighting measures

Suitable extinguishing media

Stop flow of gas before extinguishing fire. Use water spray to keep fire-exposed containers cool. Fire situation may require evacuation.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Asphyxiation due to carbon dioxide production may result. Behavior in Fire: Flame has very little color. Containers may explode in fire. (USCG, 1999)
Excerpt from ERG Guide 168 [Carbon Monoxide (Refrigerated Liquid)]: EXTREMELY FLAMMABLE. May be ignited by heat, sparks or flames. Flame may be invisible. Containers may explode when heated. Vapor explosion and poison hazard indoors, outdoors or in sewers. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Runoff may create fire or explosion hazard. (ERG, 2016)

Special protective actions for fire-fighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with carbon

dioxide, water spray, powder. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources.

Methods and materials for containment and cleaning up

1. Ventilate area of leak or release to disperse gas. 2. Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air and repair the leak or allow the cylinder to empty.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Use non-sparking handtools. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Cool. Keep in a well-ventilated room. Store in a cool, dry, well-ventilated location.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 25 ppm as TWA; BEI issued. MAK: 35 mg/m³, 30 ppm; peak limitation category: II(2); pregnancy risk group: B. EU-OEL: 23 mg/m³, 20 ppm as TWA; 117 mg/m³, 100 ppm as STEL

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Carbon monoxide is a colorless, odorless gas. Prolonged exposure to carbon monoxide rich atmospheres may be fatal. It is easily ignited. It is just lighter than air and a flame can flash back to the source of leak very easily. Under prolonged exposure to fire or intense heat the containers may violently rupture and rocket.
Colour:	Colorless gas [Note: Shipped as a nonliquefied or liquefied compressed gas].
Odour:	Odorless
Melting point/freezing point:	-205°C(lit.)

Boiling point or initial boiling point and boiling range:	?191.5°C(lit.)
Flammability:	Flammable Gas
Lower and upper explosion limit/flammability limit:	Lower: 12% by volume; Upper: 75% by volume
Flash point:	Flammable gas
Auto-ignition temperature:	1128°F
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	Viscosity gas at 273 K = 16.62 uN s/sq m
Solubility:	2 % (NIOSH, 2016)
Partition coefficient n-octanol/water:	0.83
Vapour pressure:	greater than 35 atm (NIOSH, 2016)
Density and/or relative density:	0.97 (vs air)
Relative vapour density:	0.97 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

May react vigorously with oxygen, acetylene, chlorine, fluorine or nitrous oxide.

Chemical stability

no data available

Possibility of hazardous reactions

Flammable gas. The gas mixes well with air, explosive mixtures are easily formed. The gas penetrates easily through walls and ceilings. Bromine trifluoride and carbon monoxide react explosively at high temperatures or concentrations [Mellor 2 Supp. 1:166 1956]. The same is true for various oxidizers such as: chlorine dioxide, oxygen (liquid), peroxodisulfuryl difluoride. The product of the reaction between lithium and carbon monoxide, lithium carbonyl, detonates violently with water, igniting the gaseous products [Mellor 2, Supp. 2:84 1961]. Potassium and sodium metals behave similarly. Cesium oxide, iron(III) oxide, and silver oxide all react, in the presence of moisture, at ambient temperatures with carbon monoxide causing ignition, [Mellor, 1941, vol. 2, 487]. Contact of very cold liquefied gas with water may result in vigorous or violent boiling of the product and extremely rapid vaporization due to the large temperature differences involved. If the water is hot, there is the possibility that a liquid "superheat" explosion may occur. Pressures may build to dangerous levels if liquid gas contacts water in a closed container [Handling Chemicals Safely 1980].

Conditions to avoid

no data available

Incompatible materials

May react vigorously with oxygen, acetylene, chlorine, fluorine, nitrous oxide.

Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Rat inhalation 1807 ppm/4 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance may cause effects on the blood. This may result in carboxyhaemoglobinemia and cardiac disorders. Exposure at high levels could cause death. Medical observation is indicated.

STOT-repeated exposure

The substance may have effects on the cardiovascular system and central nervous system. May cause toxicity to human reproduction or development.

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1016 (For reference only, please check.)

IMDG: UN1016 (For reference only, please check.)

IATA: UN1016 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: CARBON MONOXIDE, COMPRESSED (For reference only, please check.)

IMDG: CARBON MONOXIDE, COMPRESSED (For reference only, please check.)

IATA: CARBON MONOXIDE, COMPRESSED (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.3 (For reference only, please check.)

IMDG: 2.3 (For reference only, please check.)

IATA: 2.3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Carbon monoxide is a product of incomplete combustion of coal, oil, wood. It is present in vehicle exhaust and tobacco smoke. Depending on the degree of exposure, periodic medical examination is suggested. There is no odour warning even when toxic concentrations are present. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any