Chemical Safety Data Sheet MSDS / SDS

Phosgene SDS

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

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

Product identifier

Product name: Phosgene

CAS: 75-44-5

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

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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SECTION 2: Hazards identification

Classification of the substance or mixture

Gases under pressure: Liquefied gas
Skin corrosion, Sub-category 1B

Acute toxicity - Category 2, Inhalation

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H314 Causes severe skin burns and eye damage
H330 Fatal if inhaled

Precautionary statement(s)

Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P271 Use only outdoors or in a well-ventilated area.
P284 [In case of inadequate ventilation] wear respiratory protection.

Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
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).
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320 Specific treatment is urgent (see ... on this label).

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.
P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

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:	Phosgene
Common names and synonyms:	Phosgene
CAS number:	75-44-5
EC number:	200-870-3
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Administration of oxygen may be needed. Refer immediately for medical attention.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Rinse skin with plenty of water or shower. Refer immediately for medical attention.

Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention.

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

Phosgene is a lung toxicant that causes damage to the capillaries, bronchioles and alveoli of the lungs, by decomposition to hydrochloric acid. There is little immediate irritant effect upon the respiratory tract, and the warning properties of the gas are therefore very slight. Pulmonary edema, bronchopneumonia and occasionally lung abscesses develop. Degenerative changes in the nerves have been reported as later developments. A concentration of 25 ppm is dangerous for exposures lasting 30-60 minutes and 50 ppm is rapidly fatal after even short exposure. (EPA, 1998)

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

PREHOSPITAL/ Quickly access for a patent airway, ensure adequate respiration and pulse. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible. ... If victims can walk, lead them out of the Hot Zone to the Decontamination Zone. Victims who are unable to walk may be removed on backboards or gurneys; if these are not available, carefully carry or drag victims to safety. Victims should be kept warm and quiet; any activity subsequent to exposure may increase the likelihood of death.

SECTION 5: Firefighting measures

Suitable extinguishing media

Use remote equipment wherever possible. Use water spray to keep fire-exposed containers cool. Extinguish fire using agent suitable for surrounding fire.

Specific hazards arising from the chemical

When heated to decomposition or on contact with water or steam, it will react to produce toxic and corrosive fumes. Reacts violently with aluminum; tert-butyl azido formate; 2,4-hexadiyn-1,6-diol; isopropyl alcohol; potassium; sodium; hexafluoro isopropylidene; amino lithium; lithium. Stable in steel containers if dry. Avoid moisture. (EPA, 1998)

Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep cylinder cool by spraying with water. NO direct contact 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: chemical protection suit including self-contained breathing

apparatus. Ventilation. Shut off cylinder if possible. Remove gas with fine water spray. Isolate the area until the gas has dispersed.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Ventilation. Shut off cylinder if possible. Remove gas with fine water spray. Isolate the area until the gas has dispersed.

Methods and materials for containment and cleaning up

For liquid spills, cover with sodium bicarbonate or an equal mixture of soda ash and slaked lime. After mixing, spray water from an atomizer with great precaution. Transfer slowly into a large container of water. ... For gas spills, allow gas to flow into a mixed solution of caustic soda and slaked lime. If possible, keep in a hood until cylinder is emptied.

SECTION 7: Handling and storage

Precautions for safe handling

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 if in building. Isolated from work area. Separated from incompatible materials. See Chemical Dangers. Cool. Dry. Ventilation along the floor.Phosgene must be stored to avoid contact with water, moisture, or steam since violent reactions occur. Store in tightly closed, steel containers in an isolated area away from the work area and separated form all other materials, as well as sunlight. Although phosgene in anhydrous equipment is not corrosive to ordinary metals, in presence of moisture, use monel, tantalum, or glass-lined storage containers. Phosgene should be stored away from heating and cooling ducts. Containers should be frequently inspected for leaks.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 0.1 ppm as TWA.MAK: 0.41 mg/m3, 0.1 ppm; peak limitation category: I(2); pregnancy risk group: C.EU-OEL: 0.08 mg/m3, 0.02 ppm as TWA; 0.4 mg/m3, 0.1 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 face shield or eye protection in combination with breathing protection.

Skin protection

Cold-insulating gloves. Protective clothing.

Respiratory protection

Use closed system or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Phosgene is a colorless gas or very low-boiling, volatile liquid (b.p. 8.3°C, 48°F) with an odor of new-mown hay or green corn. Extremely toxic. Warning properties of the gas inhaled are slight, death may occur within 36 hours (Lewis, 3rd ed., 1993, p. 1027). Prolonged exposure of the containers to intense heat may result in their violent rupturing and rocketing. Rate of onset: Immediate & Delayed (Lungs) Persistence: Minutes - hours Odor threshold: 0.5 ppm Source/use/other hazard: Dye, pesticide, and other industries; history as war gas, corrosive/irritating .
Colour:	Colorless gas [Note: A fuming liquid below 47 degrees F. Shipped as a liquefied compressed gas].
Odour:	Suffocating odor; when diluted with air there is an odor reminiscent of moldy hay
Melting point/freezing point:	-118°C

Boiling point or initial boiling point and boiling range:	8.2°C at 760 mmHg
Flammability:	Not combustible.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	4°C
Auto-ignition temperature:	Not flammable (USCG, 1999)
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	6.8488X10-4 Pa.s at 263.15 K
Solubility:	Very slightly soluble (NTP, 1992)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	1180 mm Hg (20 °C)
Density and/or relative density:	0.924g/mLat 25°C
Relative vapour density:	3.4 (EPA, 1998) (Relative to Air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes above 300°C . Decomposes on contact with water or moisture. This produces corrosive hydrogen chloride (see ICSC

0163). Reacts violently with ethanol, strong oxidants, ammonia, amines and aluminium. Attacks many metals in the presence of water.
Phosgene (CG) reacts violently with strong oxidants, amines, alkalis, and many metals.Phosgene (CG) reacts with alcohols and ammonia.Above 572°F (300°C), phosgene (CG) decomposes in the presence of moisture to form hydrochloric acid and carbon dioxide.In the presence of moisture, phosgene (CG) attacks plastic, rubber, and many metals.

Chemical stability

no data available

Possibility of hazardous reactions

NONCOMBUSTIBLEThe gas is heavier than air.,Vapors are heavier than air. They will spread along the ground and collect and stay in poorly-ventilated, low-lying, or confined areas (e.g., sewers, basements, and tanks).Hazardous concentrations may develop quickly in enclosed, poorly-ventilated, or low-lying areas. Keep out of these areas. Stay upwind.Phosgene (CG) liquid sinks in water.PHOSGENE is water reactive. Incompatible with strong oxidizing agents, alcohols, amines, alkali. May react violently with aluminum, alkali metals (lithium, potassium, sodium), alcohols (isopropyl alcohol, 2,4-hexadiyn-1,6-diol), sodium azide [Bretherick, 5th ed., 1995, p. 134]. May react vigorously or explosively if mixed with diisopropyl ether or other ethers in the presence of trace amounts of metal salts [J. Haz. Mat., 1981, 4, 291]. Phosgene reacts with phosphate or silicate salts, yielding water-reactive and toxic $POCl_3$ with phosphates (Dunlap, K.L. 2005. Phosgene. In Kirk-Othmer Encyclopedia of Chemical Technology. John Wiley & Sons, Inc.).

Conditions to avoid

no data available

Incompatible materials

Violent reaction with strong oxidizers, amines, aluminum. Attacks metals in the presence of water. Attacks plastic, rubber, and coatings.

Hazardous decomposition products

When heated to decomposition ... it will react to produce toxic and corrosive fumes of /carbon monoxide/ and /hydrogen chlorides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Rat inhalation 0.334 mg/L (10 min exposure)

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

EPA-II

Reproductive toxicity

No information is available on the reproductive or developmental effects of phosgene in humans or animals.

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance is irritating to the eyes and respiratory tract. Inhalation of the gas may cause lung oedema and chemical pneumonitis. The effects may be delayed. Medical observation is indicated. See Notes. Exposure at high levels could cause death.

STOT-repeated exposure

Lungs may be affected by repeated or prolongated exposure. This may result in impaired functions and decreased resistance to infection.

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

Phosgene is extremely volatile and hydrolyzes rapidly in water (20 seconds at 0 deg C(1)), suggesting that bioconcentration will not be an important environmental fate process(SRC).

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of phosgene can be estimated to be 2.2(SRC). According to a classification scheme(2), this estimated Koc value suggests that phosgene is expected to have very high mobility in soil.

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: UN1076 (For reference only, please check.)
IMDG: UN1076 (For reference only, please check.)
IATA: UN1076 (For reference only, please check.)

UN Proper Shipping Name

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

A serious intoxication may develop even without experiencing symptoms of irritation or detecting the characteristic odour (grass or hay). The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Do NOT spray water on a leaking cylinder (to prevent corrosion of the cylinder). Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. The information in this ICSC would also apply to phosgene generated by chemical reactions or by decomposition of organic compounds containing chlorine.