

SAFETY DATA SHEET



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CHLOROBENZENE

SDS No. M0030

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Chlorobenzene

Synonyms: Monochlorobenzene; Chlorobenzol; Phenyl chloride; Benzene chloride

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 3

Acute Toxicity, Oral: GHS Category 4

Skin Irritation: GHS Category 3

Eye Irritation: GHS Category 2A

Label Elements

Signal Word: WARNING!

Hazard Statements:

- H226 – Flammable liquid and vapor.
- H303 – May be harmful if swallowed.
- H315 – Causes skin irritation.
- H320 – Causes eye irritation.
- H333 – May be harmful if inhaled.
- H336 – May cause drowsiness and dizziness

Precautionary Statements:

- P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- P243 – Take precautionary measure against static discharge.
- P280 – Wear protective gloves/protective clothing/eye protection/face protection.
- P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Emergency Overview

Cause irritation to eyes, skin, and respiratory tract. Breathing vapors may cause drowsiness and dizziness. May be harmful if swallowed or inhaled. May cause liver damage. Flammable liquid and vapor. Possible static electrical hazard. Target Organs: Central nervous system, liver, respiratory system, eyes, and skin.

HMIS Rating:

Health – 2* Flammability – 3 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Chlorobenzene	108-90-7	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation. Get medical aid.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person. Get medical help immediately.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation persists.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Flammable liquid and vapor (GHS Category 3)

Auto-ignition Temperature: 590° C (1094° F)

Flash Point: 28° C (82.4° F)

Flammable Limits: Lower Limit – 1.8 vol %, Upper Limit – 9.6 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (hydrogen chloride, phosgene, carbon monoxide, and carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Fire Fighting Media: Water may be ineffective. Do not use straight streams of water. For small fires, use dry chemical, carbon dioxide, water spray or regular foam. . For large fires, use water spray, fog, or regular foam.

National Fire Protective Association: Health - 2, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Water spray may reduce vapors but still not prevent ignition in closed spaces. Vapor suppressing foam may be used to reduce vapors. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Do

not use sawdust or any combustible material. Avoid runoff to ditches and storm sewers that lead to water ways. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or other appropriate eye protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 10 ppm TWA

NIOSH – 1000 ppm IDLH

OSHA Final PELs – 75 ppm TWA; 350 mg/m³ TWA

OSHA Vacated PELs – 75 ppm TWA; 350 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Mild, almond-like odor

Odor Threshold: 1-8 ppm

Molecular Formula: C₆H₅Cl

Molecular Weight: 112.56

Auto-ignition Temperature: 590° C (1094° F)

Flash Point: 28° C (82.4° F)

Flammable Limits: Lower Limit – 1.8 vol %, Upper Limit – 9.6 vol %

pH: Not available.

Boiling Point: 131° C @ 760 mm Hg

Freezing/Melting Point: -45° C

Decomposition Temperature: Not available

Specific Gravity: 1.107 g/cm³

Vapor Density (Air=1): 3.9

Vapor Pressure: 12 mm Hg @ 25° C.

Evaporation Rate (Butyl acetate = 1): 1.0

Viscosity: 0.8 cP 20° C

Solubility: Insoluble

Conductivity: Semiconductive; Conductivity = 7000 pS/m; Dielectric Constant = 5.621; Relaxation Time Constant = 7.1×10^{-3} seconds

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperature and pressure.

Conditions to Avoid: Ignition sources, excess heat.

Incompatibility With Various Substances: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Causes respiratory tract irritation. Vapors may cause drowsiness and dizziness.

INGESTION HAZARD: May cause liver and kidney damage. May cause central nervous system depression with excitement followed by headache, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma, and possible death. May cause hemolysis.

SKIN CONTACT HAZARD: Causes skin irritation. Repeated or prolonged exposure may cause defatting of skin and dermatitis. Produces acneiform eruptions.

EYE CONTACT HAZARD: Causes eye irritation.

Chronic Exposure Hazards: Chronic inhalation and ingestion may cause symptoms similar to acute inhalation and ingestion. Chronic exposure may cause liver damage. Repeated contact may result in skin burns.

Animal Toxicity:

Inhalation, rat: LC50 = 2965 ppm/6H;

Oral, mouse: LD50 = 2300 mg/kg;

Oral, rabbit: LD50 = 2250 mg/kg;

Oral, rat: LD50 = 1110 mg/kg;

Skin, rabbit: LD50 = >2200 mg/kg;

Carcinogenicity: ACGIH – A3, confirmed animal carcinogen with unknown relevance to humans; Not listed as a carcinogen by IARC, NTP, or CA Prop 65

Epidemiology: No information available.

Teratogenicity: Experimental teratogen.

Reproductive Effects: Studies in rats exposed up to 450 ppm via inhalation resulted in no significant impact on reproductive performance or fertility.

Mutagenicity: No information available.

Neurotoxicity: May be a nervous system depressant.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No information available.

Environmental Fate: Once released, concentration lowered due to dilution. May percolate into ground water if soil is sandy and poor in organic matter. Little bioconcentration expected in fish and food products.

Physical: No information available.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is a "U" listed waste (U037).

14. TRANSPORT INFORMATION

US DOT, IATA, IMO

Proper Shipping Name: Chlorobenzene
 Hazard Class: 3
 UN Number: UN1134
 Packing Group: III

Canada TDG

Additional Information: Flashpoint 28 C

15. REGULATORY INFORMATION

US Federal Regulations:

TSCA: CAS# 108-90-7 is listed on the TSCA Inventory.
 Health and Safety Reporting List: Not listed.
 Chemical Test Rules: CAS# 108-90-7: 40 CFR 799.5115.
 Section 12b: Section 4.
 TSCA Significant New Use Rule: Does not have an SNUR under TSCA.
 CERCLA Hazardous Substances: CAS# 108-90-7; 100 lbs/45.4 kg final RQ
 SARA Section 302: Does not have a TPQ
 SARA Codes: CAS# 108-90-7 – immediate, delayed, fire
 Section 313: Chlorobenzene (CAS# 108-90-7) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
 Clean Air Act: CAS# 108-90-7 is listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.
 Clean Water Act: CAS# 108-90-7 is listed as a Hazardous Substance. It is listed as a Priority Pollutant. It is not a Toxic Pollutant.
 OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 108-90-7 is on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts
 California Prop 65: California No Significant Risk Level: Not listed

Canada:

DSL/NDSL: CAS# 108-90-7 is listed on Canada's DSL list.
 WHMIS: This product has a WHMIS classification of B2, D2A. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations.
 Ingredient Disclosure List: CAS# 108-90-7 is listed on Canada's Ingredient Disclosure List.

DSCL (EEC):

Hazard Symbols: Xn, F, N
 Risk Phrases: R10 – Flammable; R20 – Harmful by inhalation; R51/53 – Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 Safety Phrases: S24/25 – Avoid contact with eyes and skin; S61 – Avoid release to the environment. Refer to special instructions/safety data sheets...
 WGK (Water Danger/protection): CAS# 108-90-7: 2

16. OTHER INFORMATION

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The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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