

MATERIAL SAFETY DATA SHEET

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Version 1.4

Section 1 - Product and Company Information

Product Name	CHLOROBENZENE, 99%
Product Number	101389
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
CHLOROBENZENE	108-90-7	Yes
Formula	C6H5Cl	
Synonyms	Benzene chloride * Chloorbenzeen (Dutch) * Chlorbenzene * Chlorbenzol * Chlorobenzen (Polish) * Chlorobenzene (ACGIH:OSHA) * Chlorobenzenu (Czech) * Clorobenzene (Italian) * MCB * Monochloorbenzeen (Dutch) * Monochlorbenzene * Monochlorbenzol (German) * Monochlorobenzene (OSHA) * Monoclorobenzene (Italian) * NCI-C54886 * Phenyl chloride * Tetrosin SP	
RTECS Number:	CZ0175000	

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable. Harmful. Dangerous for the environment.
Harmful by inhalation and if swallowed. Irritating to eyes,
respiratory system and skin. Toxic to aquatic organisms, may cause
long-term adverse effects in the aquatic environment.
Target organ(s): Liver. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

FLASH POINT

81 °F 27 °C Method: closed cup

EXPLOSION LIMITS

Lower: 1.3 % Upper: 7.1 %

AUTOIGNITION TEMP

637 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	10 PPM
USA	MSHA Standard-air	TWA	75 PPM (350 MG/M3)
USA	OSHA.	PEL	8H TWA 75 PPM (350 MG/M3)

New Zealand OEL

Remarks: check ACGIH TLV

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	50 MG/M3
Poland		NDSch	150 MG/M3
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	112.56 AMU	
pH	N/A	
BP/BP Range	132 °C	760 mmHg
MP/MP Range	-46 - -45 °C	
Freezing Point	N/A	
Vapor Pressure	11.8 mmHg	25 °C
Vapor Density	3.86 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.107 g/cm3	

Bulk Density	N/A	
Odor Threshold	0.21 ppm	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	33 mN/m	25 °C
Partition Coefficient	Log Kow: 2.89	
Decomposition Temp.	N/A	
Flash Point	81 °F 27 °C	Method: closed cup
Explosion Limits	Lower: 1.3 % Upper: 7.1 %	
Flammability	N/A	
Autoignition Temp	637 °C	
Refractive Index	1.524	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Other Solvents: ETHANOL, ETHYL ETHER, BENZENE CHLOROFORM	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Liver. Kidneys. Central nervous system. Thymus. Spleen. Bone marrow. Lungs. Testes.

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: Incoordination. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral

Rat

1110 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity).
Behavioral:Tremor. Behavioral:Ataxia.

Inhalation
Rat
2,965 ppm
LC50

Intraperitoneal
Rat
1655 MG/KG
LD50

Oral
Mouse
2300 mg/kg
LD50

Intraperitoneal
Mouse
515 MG/KG
LD50

Oral
Rabbit
2250 mg/kg
LD50

Oral
Guinea pig
2250 mg/kg
LD50

Oral
Mammal
2300 mg/kg
LD50

Inhalation
Mammal
10,000 mg/m3
LC50

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Species: Rat
Route of Application: Oral
Dose: 61800 MG/KG
Exposure Time: 2Y
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.
Blood:Tumors.

NTP CARCINOGEN LIST

Rating: Some evidence.
Species: Rat
Route: Gavage

ACGIH CARCINOGEN LIST

Rating: A3

IRIS/EPA CARCINOGEN LIST

Rating: Group D

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 75 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat

Dose: 210 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Specific Developmental Abnormalities: Hepatobiliary system.

Species: Rabbit

Dose: 10 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-18D PREG)

Result: Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - MUTAGEN

Species: Mouse

Route: Intraperitoneal

Dose: 225 MG/KG

Exposure Time: 24H

Mutation test: Micronucleus test

Species: Mouse

Dose: 70 MG/L (+S9)

Cell Type: lymphocyte

Mutation test: Mutation in microorganisms

Species: Mouse

Route: Intraperitoneal

Dose: 1 GM/KG

Mutation test: Cytogenetic analysis

Species: Mouse

Dose: 100 MG/L

Cell Type: lymphocyte

Mutation test: Mutation in mammalian somatic cells.

Species: Hamster

Dose: 300 MG/L

Cell Type: ovary

Mutation test: Sister chromatid exchange

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rabbit

Dose: 590 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-18D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g.,
dead and/or resorbed implants per total number of implants).

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Time: 48 h
Value: 235 mg/l

Test Type: EC50 Algae
Species: Selenastrum capricornutum resp.
Time: 96 h
Value: 12.5 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 4.3 - 16 mg/l

Test Type: EC50 Daphnia
Time: 24 h
Value: 7.6 mg/l

Test Type: LC100 Fish
Species: Leuciscus idus
Time: 48 h
Value: 0.03 - 28 mg/l

Test Type: LC50 Fish
Species: Cyprinodon variegatus (Sheepshead minnow)
Time: 96 h
Value: 10 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 76 h
Value: 4.5 - 7.40 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Chlorobenzene
UN#: 1134
Class: 3
Packing Group: Packing Group III
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Chlorobenzene

IATA UN Number: 1134
Hazard Class: 3
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xn N
Indication of Danger: Harmful. Dangerous for the environment.
R: 10 20 51/53
Risk Statements: Flammable. Harmful by inhalation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S: 24/25 61
Safety Statements: Avoid contact with skin and eyes. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable. Harmful. Dangerous for the environment.
Risk Statements: Harmful by inhalation and if swallowed. Irritating to eyes, respiratory system and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Statements: Avoid contact with skin and eyes. Avoid release to the environment. Refer to special instructions/safety data sheets.
US Statements: Target organ(s): Liver. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.