



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 07/14/2014

Version 1.2

SECTION 1. Identification

Product identifier

Product number	801791
Product name	Chlorobenzene for synthesis
CAS-No.	108-90-7

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

Identified uses	Chemical for synthesis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 3, H226

Acute toxicity, Category 4, Inhalation, H332

Chronic aquatic toxicity, Category 2, H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word

Warning

Hazard Statements

H226 Flammable liquid and vapor.

H332 Harmful if inhaled.

H411 Toxic to aquatic life with long lasting effects.

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Precautionary Statements

P210 Keep away from heat.

P273 Avoid release to the environment.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	C ₆ H ₅ Cl	C ₆ H ₅ Cl (Hill)
Molar mass	112.56 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

chlorobenzene (>= 90 % - <= 100 %)

108-90-7

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. If breathing stops: mouth-to-mouth breathing or artificial respiration. Oxygen if necessary. Immediately call in physician.

Skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

Eye contact

After eye contact: rinse out with plenty of water.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Dermatitis, Pain, narcosis, agitation, spasms, Diarrhea, Vomiting, Headache, ataxia (impaired locomotor coordination), CNS disorders

Drying-out effect resulting in rough and chapped skin.

Indication of any immediate medical attention and special treatment needed

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No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Water, Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at elevated temperatures.

Pay attention to flashback.

Development of hazardous combustion gases or vapors possible in the event of fire.

Fire may cause evolution of:

Hydrogen chloride gas, Phosgene

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system. Remove container from danger zone and cool with water.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

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Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>chlorobenzene</i>	<i>108-90-7</i>		
ACGIH	Time Weighted Average (TWA):	10 ppm	
OSHA_TRANS	PEL:	75 ppm 350 mg/m ³	
Z1A	Time Weighted Average (TWA):	75 ppm 350 mg/m ³	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

Flame retardant antistatic protective clothing

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	benzene-like
Odor Threshold	0.09 - 59.8 ppm
pH	at 68 °F (20 °C) neutral
Melting point	-45 °C
Boiling point/boiling range	270 °F (132 °C) at 1,013 hPa
Flash point	81 °F (27 °C) Method: DIN 51755 Part 1
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.3 %(V)
Upper explosion limit	11 %(V)
Vapor pressure	12 hPa at 68 °F (20 °C)
Relative vapor density	3.9
Density	1.11 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	0.4 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 2.84 (experimental) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.

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Product number 801791
Product name Chlorobenzene for synthesis

Viscosity, dynamic 0.8 mPa.s
at 68 °F (20 °C)

Explosive properties Not classified as explosive.

Oxidizing properties none

Ignition temperature 1094 °F (590 °C)

SECTION 10. Stability and reactivity

Reactivity

steam-volatile
Vapor/air-mixtures are explosive at intense warming.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions

Exothermic reaction with:
Alkali metals, Alkaline earth metals, Oxidizing agents, dimethyl sulfoxide, Nitric acid
Risk of explosion with:
sodium, in finely distributed form.
PHOSPHORUS TRICHLORIDE, with, sodium

Conditions to avoid

Heating.

Incompatible materials

rubber

Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure
Inhalation, Eye contact, Skin contact

Target Organs

Eyes
Skin
Respiratory system
Central nervous system
Liver

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Acute oral toxicity

LD50 rat: 1,100 mg/kg (IUCLID)

Symptoms: Pain, Vomiting, Diarrhea, Risk of aspiration upon vomiting., Pulmonary failure possible after aspiration of vomit.

Acute inhalation toxicity

LC50 rat: 13.9 mg/l; 6 h (IUCLID)

absorption

Acute dermal toxicity

absorption

Skin irritation

rabbit

Result: slight irritation

OECD Test Guideline 404

Dermatitis Drying-out effect resulting in rough and chapped skin.

Eye irritation

rabbit

Result: No eye irritation

OECD Test Guideline 405

Sensitization

Sensitization test: guinea pig

Result: negative

Method: OECD Test Guideline 406

Genotoxicity in vitro

Ames test

Result: negative

Method: OECD Test Guideline 471

Mutagenicity (mammal cell test):

Result: negative

Method: OECD Test Guideline 476

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

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NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	Confirmed animal carcinogen with unknown relevance to humans. chlorobenzene 108-90-7

Further information

Systemic effects:

CNS disorders, tachycardia, drop in blood pressure, agitation, spasms, ataxia (impaired locomotor coordination), narcosis, Headache

Damage to:

Liver, Kidney

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Salmo: 10.4 mg/l; 96 h

OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

EC0 E.sulcatum: > 390 mg/l; 72 h (Lit.)

EC50 Daphnia magna (Water flea): 20 mg/l; 48 h

OECD Test Guideline 202

Toxicity to algae

IC50 Pseudokirchneriella subcapitata (green algae): 12.5 mg/l; 96 h (IUCLID)

Toxicity to bacteria

EC50 activated sludge: 140 mg/l; 30 min

OECD Test Guideline 209

Persistence and degradability

Biodegradability

15 %; 28 d

OECD Test Guideline 301C

Not readily biodegradable.

Theoretical oxygen demand (ThOD)

2,060 mg/g

(Lit.)

Ratio BOD/ThBOD

BOD5 1.5 %

(Lit.)

Ratio COD/ThBOD

20 %

(Lit.)

Bioaccumulative potential

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Partition coefficient: n-octanol/water

log Pow: 2.84

(experimental)

(Lit.) Bioaccumulation is not expected.

Mobility in soil

Distribution among environmental compartments

Adsorption/Soil

log Koc: 2.35

(experimental)

Moderately mobile in soils

Other adverse effects

Henry constant

315 Pa*m³/mol

Method: (experimental)

(Lit.) Distribution preferentially in air.

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 1134
Proper shipping name	CHLOROBENZENE
Class	3
Packing group	III
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 1134
Proper shipping name	CHLOROBENZENE
Class	3
Packing group	III
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

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UN number UN 1134
Proper shipping name CHLOROBENZENE
Class 3
Packing group III
Environmentally hazardous --
Special precautions for user yes
EmS F-E S-D

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Flammable Liquid
Harmful if swallowed.
Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

chlorobenzene	108-90-7	100 %
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SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients

chlorobenzene

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients

chlorobenzene

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

chlorobenzene

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Pennsylvania Right To Know

Ingredients

chlorobenzene

New Jersey Right To Know

Ingredients

chlorobenzene

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

H226 Flammable liquid and vapor.
H332 Harmful if inhaled.
H411 Toxic to aquatic life with long lasting effects.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 07/14/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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