# Material Safety Data Sheet

**Creation Date** 10-Sep-2009 **Revision Date** 22-Sep-2009 **Revision Number** 1

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** **Chlorobenzene**

**Cat No.** **B254-4; B254-4LC; B254-20; B254RS-200; B255-1; B255-500**

**Synonyms** Monochlorobenzene; Benzene chloride (Laboratory/Certified)

**Recommended Use** Laboratory chemicals

**Company**
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

**Emergency Telephone Number**
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 703-527-3887

## 2. HAZARDS IDENTIFICATION

**WARNING!**

**Emergency Overview**

Flammable liquid and vapor. Possible cancer hazard. May cause cancer based on animal data. Harmful by inhalation. Irritating to eyes and skin. May cause central nervous system effects. May cause irritation of respiratory tract. Aspiration hazard if swallowed - can enter lungs and cause damage. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Appearance** Clear **Physical State** Liquid **odor** bitter almond

**Target Organs** Eyes, Skin, Central nervous system (CNS), Liver, Kidney, Blood

**Potential Health Effects**

**Acute Effects**
**Principle Routes of Exposure**

| | |
|---|---|
| **Eyes** | Irritating to eyes. |
| **Skin** | Irritating to skin. May be harmful in contact with skin. |
| **Inhalation** | Harmful by inhalation. Inhalation may cause central nervous system effects. May cause irritation of respiratory tract. |
| **Ingestion** | Aspiration hazard. May be harmful if swallowed. May cause central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. |

**Chronic Effects** Possible cancer hazard based on tests with laboratory animals. Tumorigenic effects have been reported in experimental animals.. Experiments have shown reproductive toxicity effects on laboratory animals. May cause adverse liver effects. May cause adverse kidney effects.

See Section 11 for additional Toxicological information.

**Aggravated Medical Conditions** Central nervous system disorders. Preexisting eye disorders. Liver disorders. Skin disorders.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Haz/Non-haz**

| Component | CAS-No | Weight % |
|---|---|---|
| Chlorobenzene | 108-90-7 | >95 |

## 4. FIRST AID MEASURES

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

**Skin Contact** Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

**Inhalation** Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

**Ingestion** Do not induce vomiting. Obtain medical attention.

**Notes to Physician** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

**Flash Point** 23°C / 73.4°F

**Method** No information available.

**Autoignition Temperature** 590°C / 1094°F

**Explosion Limits**
**Upper** 9.6 vol %
**Lower** 1.8 vol %

**Suitable Extinguishing Media** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

**Unsuitable Extinguishing Media** No information available.

**Hazardous Combustion Products** No information available.

**Sensitivity to mechanical impact** No information available.
**Sensitivity to static discharge** No information available.

**Specific Hazards Arising from the Chemical**
Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated.

**Protective Equipment and Precautions for Firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

**NFPA** **Health** 3 **Flammability** 3 **Instability** 0 **Physical hazards** N/A

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions** Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges.

**Environmental Precautions** Should not be released into the environment.

**Methods for Containment and Clean Up** Remove all sources of ignition. Soak up with inert absorbent material. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. Keep in suitable and closed containers for disposal.

## 7. HANDLING AND STORAGE

**Handling** Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use explosion-proof equipment. Take precautionary measures against static discharges.

**Storage** Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Flammables area.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Measures** Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment.

**Exposure Guidelines**

| Component | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|---|---|---|---|
| Chlorobenzene | TWA: 10 ppm | (Vacated) TWA: 75 ppm<br>(Vacated) TWA: 350 mg/m$^3$<br>TWA: 75 ppm<br>TWA: 350 mg/m$^3$ | IDLH: 1000 ppm |

| Component | Quebec | Mexico OEL (TWA) | Ontario TWAEV |
|---|---|---|---|
| Chlorobenzene | TWA: 230 mg/m$^3$<br>TWA: 50 ppm | TWA: 350 mg/m$^3$<br>TWA: 75 ppm | TWA: 10 ppm |

***NIOSH IDLH:*** *Immediately Dangerous to Life or Health*

**Personal Protective Equipment**

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical State** | Liquid |
| **Appearance** | Clear |
| **odor** | bitter almond |
| **Odor Threshold** | No information available. |
| **pH** | No information available. |
| **Vapor Pressure** | 12 mbar @ 20°C |
| **Vapor Density** | 3.9 (Air = 1.0) |
| **Viscosity** | 0.8 mPa.s @ 20°C |
| **Boiling Point/Range** | 131°C / 267.8°F |
| **Melting Point/Range** | -45°C / -49°F |
| **Decomposition temperature °C** | No information available. |
| **Flash Point** | 23°C / 73.4°F |
| **Evaporation Rate** | (Butyl Acetate = 1.0) |
| **Specific Gravity** | 1.108 |
| **Solubility** | Insoluble in water |
| **log Pow** | No data available |
| **Molecular Weight** | 112.56 |
| **Molecular Formula** | C6 H5 Cl |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability** | Stable under normal conditions. |
| **Conditions to Avoid** | Incompatible products. Heat, flames and sparks. |
| **Incompatible Materials** | Strong oxidizing agents, Bases, Strong reducing agents, Metals |
| **Hazardous Decomposition Products** | Carbon monoxide (CO), Carbon dioxide ($CO_2$), Hydrogen chloride gas, Phosgene |
| **Hazardous Polymerization** | Hazardous polymerization does not occur. |
| **Hazardous Reactions .** | None under normal processing.. |

## 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**

**Product Information** See actual entry in RTECS for complete information.

**Component Information**

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Chlorobenzene | 1110 mg/kg ( Rat ) | Not listed | Not listed |

**Irritation** Irritating to eyes and skin

**Toxicologically Synergistic Products** No information available.

### Chronic Toxicity

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component | ACGIH | IARC | NTP | OSHA | Mexico |
|---|---|---|---|---|---|
| Chlorobenzene | A3 | Not listed | Not listed | Not listed | Not listed |

**ACGIH: (American Conference of Governmental Industrial Hygienists)**
A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)

**Sensitization** No information available.

**Mutagenic Effects** Mutagenic effects have occurred in experimental animals.

**Reproductive Effects** Experiments have shown reproductive toxicity effects on laboratory animals.

**Developmental Effects** Developmental effects have occurred in experimental animals.

**Teratogenicity** No information available.

**Other Adverse Effects** Tumorigenic effects have been reported in experimental animals.. See actual entry in RTECS for complete information.

**Endocrine Disruptor Information** No information available

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

| Component | Freshwater Algae | Freshwater Fish | Microtox | Water Flea |
|---|---|---|---|---|
| Chlorobenzene | EC50 96 h 12.5 mg/L | Not listed | EC50 = 11.26 mg/L 30 min<br>EC50 = 11.3 mg/L 30 min<br>EC50 = 11.5 mg/L 15 min<br>EC50 = 20 mg/L 10 min<br>EC50 = 9.36 mg/L 5 min | EC50 48 h 0.59 mg/L |

**Persistence and Degradability** Not readily biodegradable. Biodegradability. 15%/28d.

**Bioaccumulation/ Accumulation** No information available

**Mobility** .

| Component | log Pow |
|---|---|
| Chlorobenzene | 2.8 |

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

| Component | RCRA - U Series Wastes | RCRA - P Series Wastes |
|---|---|---|
| Chlorobenzene - 108-90-7 | U037 | - |

## 14. TRANSPORT INFORMATION

**DOT**

| | |
|---|---|
| **UN-No** | UN1134 |
| **Proper Shipping Name** | CHLOROBENZENE |
| **Hazard Class** | 3 |
| **Packing Group** | III |

**TDG**

| | |
|---|---|
| **UN-No** | UN1134 |
| **Proper Shipping Name** | CHLOROBENZENE |
| **Hazard Class** | 3 |
| **Packing Group** | III |

**IATA**

| | |
|---|---|
| **UN-No** | UN1134 |
| **Proper Shipping Name** | Chlorobenzene |
| **Hazard Class** | 3 |
| **Packing Group** | III |

**IMDG/IMO**

| | |
|---|---|
| **UN-No** | UN1134 |
| **Proper Shipping Name** | Chlorobenzene |
| **Hazard Class** | 3 |
| **Packing Group** | III |

## 15. REGULATORY INFORMATION

**International Inventories**

| Component | TSCA | DSL | NDSL | EINECS | ELINCS | NLP | PICCS | ENCS | AICS | CHINA | KECL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorobenzene | T | X | - | 203-628-5 | - | | X | X | X | X | KE-25489 X |

**Legend:**
**X - Listed**
**E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.**
**F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.**
**N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.**
**P - Indicates a commenced PMN substance**
**R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.**

**S - Indicates a substance that is identified in a proposed or final Significant New Use Rule**
**T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.**
**XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).**
**Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.**
**Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.**

## U.S. Federal Regulations

### TSCA 12(b)

| Component | TSCA 12(b) |
|---|---|
| Chlorobenzene | Section 4 |

### SARA 313

| Component | CAS-No | Weight % | SARA 313 - Threshold Values % |
|---|---|---|---|
| Chlorobenzene | 108-90-7 | >95 | 1.0 |

### SARA 311/312 Hazardous Categorization

| | |
|---|---|
| **Acute Health Hazard** | No |
| **Chronic Health Hazard** | No |
| **Fire Hazard** | Yes |
| **Sudden Release of Pressure Hazard** | No |
| **Reactive Hazard** | No |

### Clean Water Act

| Component | CWA - Hazardous Substances | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |
|---|---|---|---|---|
| Chlorobenzene | X | 100 lb | - | X |

### Clean Air Act

| Component | HAPS Data | Class 1 Ozone Depletors | Class 2 Ozone Depletors |
|---|---|---|---|
| Chlorobenzene | X | | - |

### OSHA
Not applicable

### CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Component | Hazardous Substances RQs | CERCLA EHS RQs |
|---|---|---|
| Chlorobenzene | 100 lb | - |

### California Proposition 65
This product does not contain any Proposition 65 chemicals.

### State Right-to-Know

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Chlorobenzene | X | X | X | X | X |

### U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

### U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

### Other International Regulations

**Mexico - Grade** Serious risk, Grade 3

**Canada**

**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.**

**WHMIS Hazard Class**
B2 Flammable liquid
D1B Toxic materials
D2B Toxic materials

## 16. OTHER INFORMATION

**Prepared By** Regulatory Affairs
Thermo Fisher Scientific
Tel: (412) 490-8929

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**Print Date** 22-Sep-2009

**Revision Summary** "***", and red text indicates revision

**Disclaimer**
**The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.**

**End of MSDS**