Material Safety Data Sheet

Benzyl chloroformate, 97%, stabilized with 0.1% anhydrous sodium carbonate

ACC# 95593

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzyl chloroformate, 97%, stabilized with 0.1% anhydrous sodium carbonate
Catalog Numbers: AC152940000, AC152940050, AC152941000, AC9608050, NC9114682, XXAC15294-1L, XXAC15294-1LT, XXAC152942.5
Synonyms: Carbobenzoxy chloride; Carbonochloride acid benzyl ester; Carbonochloridic acid phenylmethyl ester; Chloroformic acid benzyl ester; Benzylcarbonyl chloride.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
501-53-1	Benzyl chloroformate	97	207-925-0
75-44-5	Phosgene	<0.5	200-870-3
100-44-7	Benzyl chloride	0.1-3	202-853-6
497-19-8	Sodium carbonate	0.1	207-838-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: oily liquid. Flash Point: 91 deg C.
Danger! Contains material which may cause cancer based on animal data. Can decompose violently at elevated temperatures. Heating may cause an explosion. Causes digestive and respiratory tract burns. Causes severe eye and skin burns. Harmful if inhaled. Reactive.
Combustible liquid and vapor. Moisture sensitive. Marine pollutant. Keep refrigerated. (Store below 4°C/39°F.)
Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. May cause blindness. Lachrymator (substance which increases the flow of tears).
Skin: Causes skin burns.
Ingestion: Causes gastrointestinal tract burns.
Inhalation: Harmful if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.
Chronic: Not available. Product contains benzyl chloride which may cause cancer based on animal data.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Decomposes at high temperatures, resulting in toxic and corrosive products. Explosive decomposition may occur under fire conditions. Combustible liquid and vapor. 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.
Extinguishing Media: Use dry sand or earth to smother fire. Use carbon dioxide. Use dry chemical. DO NOT USE WATER OR FOAM.
Flash Point: 91 deg C (195.80 deg F)
Autoignition Temperature: 590 deg C (1,094.00 deg F)
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 2

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Spill may be carefully neutralized with soda ash (sodium carbonate).

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat and flame. Do not breathe vapor or mist. Systems and equipment must be scrupulously dry.
Storage: Keep refrigerated. (Store below 4°C/39°F.) Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Bottles should be vented periodically in order to overcome pressure buildup.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzyl chloroformate	none listed	none listed	none listed
Phosgene	0.1 ppm TWA	0.1 ppm TWA; 0.4 mg/m3 TWA 2 ppm IDLH	0.1 ppm TWA; 0.4 mg/m3 TWA
Benzyl chloride	1 ppm TWA	10 ppm IDLH	1 ppm TWA; 5 mg/m3 TWA
Sodium carbonate	none listed	none listed	none listed

OSHA Vacated PELs: Benzyl chloroformate: No OSHA Vacated PELs are listed for this chemical. Phosgene: 0.1 ppm TWA; 0.4 mg/m3 TWA Benzyl chloride: 1 ppm TWA; 5 mg/m3 TWA Sodium carbonate: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles and face shield.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: 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.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless to light yellow - oily
Odor: phosgene odor (resembling that of newly mown hay) - acrid odor
pH: acidic
Vapor Pressure: 0.101 mm Hg @ 25 deg C
Vapor Density: >1 (air=1)
Evaporation Rate: Not available.
Viscosity: 2.57 cP @ 20 deg C
Boiling Point: 103 deg C @ 20 mm Hg
Freezing/Melting Point:-20 deg C
Decomposition Temperature:> 100 deg C
Solubility: decomposes to form HCl
Specific Gravity/Density:1.2 g/ml
Molecular Formula:C8H7ClO2
Molecular Weight:170.60

Section 10 - Stability and Reactivity

Chemical Stability: Thermally unstable. Heat will result in decomposition to hydrogen chloride gas.
Conditions to Avoid: Excess heat, exposure to moist air or water, confined spaces.
Incompatibilities with Other Materials: Metals, strong oxidizing agents, acids, bases, alcohols, amines, nitrates, iron salts, activated carbon, rust.
Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon dioxide, benzyl alcohol.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 501-53-1: LQ5860000
CAS# 75-44-5: SY5600000
CAS# 100-44-7: XS8925000

CAS# 497-19-8: VZ4050000
LD50/LC50:
CAS# 501-53-1:
Inhalation, rat: LC50 = 590 mg/m3/4H;
Oral, rat: LD50 = 3 gm/kg;
.

CAS# 75-44-5:
.

CAS# 100-44-7:
Inhalation, mouse: LC50 = 80 ppm/2H;
Inhalation, mouse: LC50 = 390 mg/m3/2H;
Inhalation, rat: LC50 = 150 ppm/2H;
Inhalation, rat: LC50 = 740 mg/m3/2H;
Oral, mouse: LD50 = 1500 mg/kg;
Oral, rat: LD50 = 1231 mg/kg;
.

CAS# 497-19-8:
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, eye: 50 mg Severe;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, mouse: LC50 = 1200 mg/m3/2H;
Inhalation, rat: LC50 = 2300 mg/m3/2H;
Oral, mouse: LD50 = 6600 mg/kg;
Oral, mouse: LD50 = 6600 mg/kg;
Oral, rat: LD50 = 4090 mg/kg;
.

Carcinogenicity:
CAS# 501-53-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 75-44-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 100-44-7:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Group 2A carcinogen

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment. Fish toxicity: Br.rerio LC50: 4.64-10.0 mg/l/96 h.
Physical: BOD5: 750 mg/g. COD: 1650 mg/g.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: CAS# 75-44-5: waste number P095. CAS# 100-44-7: waste number P028.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BENZYL CHLOROFORMATE	BENZYL CHLOROFORMATE
Hazard Class:	8	8
UN Number:	UN1739	UN1739
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 501-53-1 is listed on the TSCA inventory.
CAS# 75-44-5 is listed on the TSCA inventory.
CAS# 100-44-7 is listed on the TSCA inventory.
CAS# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

CAS# 100-44-7: Testing required by manufacturers, processors

Section 12b

CAS# 100-44-7: Section 4

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 75-44-5: 10 lb final RQ; 4.54 kg final RQ CAS# 100-44-7: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 75-44-5: 10 lb TPQ CAS# 100-44-7: 500 lb TPQ

SARA Codes

CAS # 501-53-1: immediate, fire, reactive.
CAS # 100-44-7: immediate, delayed, fire, reactive.
CAS # 497-19-8: immediate.

Section 313

Phosgene is not at a high enough concentration to be reportable under Section 313.
This material contains Benzyl chloride (CAS# 100-44-7, 0.1-3%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 75-44-5 is listed as a hazardous air pollutant (HAP).
CAS# 100-44-7 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 75-44-5 is listed as a Hazardous Substance under the CWA. CAS# 100-44-7 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 75-44-5 is considered highly hazardous by OSHA.

STATE

CAS# 501-53-1 can be found on the following state right to know lists: New Jersey.
CAS# 75-44-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 100-44-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

WARNING: This product contains Benzyl chloride, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: CAS# 100-44-7: 4 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T C N

Risk Phrases:

R 34 Causes burns.
R 45 May cause cancer.
R 20 Harmful by inhalation.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face pr otection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou s waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 501-53-1: No information available.
CAS# 75-44-5: 2
CAS# 100-44-7: 3
CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 501-53-1 is listed on Canada's DSL List.
CAS# 75-44-5 is listed on Canada's DSL List.
CAS# 100-44-7 is listed on Canada's DSL List.
CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E, B3, D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 501-53-1 is listed on the Canadian Ingredient Disclosure List.
CAS# 75-44-5 is listed on the Canadian Ingredient Disclosure List.
CAS# 100-44-7 is listed on the Canadian Ingredient Disclosure List.
CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/01/1997
Revision #4 Date: 10/13/2003