BENZYL CHLORIDE

BCL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
alpha-Chlorotoluene omega-Chlorotoluene	Watery liquid Sinks in water.	Colorless to yellow	Sharp irritating odor

Restrict access.
Avoid contact with liquid.
Stop discharge if possible.
Call fire department.
Call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Combustible.
Irritating gases are produced when heated.
Wear goggles and self-contained breathing apparatus.
Extinguish with water, dry chemicals, foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

Call for medical aid.

LIQUID
Will burn skin and eyes.
If swallowed will cause nausea, and vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Collection Systems: Pump
Chemical and Physical Treatment:
Neutralize
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 36; Halogenated hydrocarbons
2.2 Formula: $C_6H_5CH_2Cl$
2.3 IMO/UN Designation: 8/1738
2.4 DOT ID No.: 1738
2.5 CAS Registry No.: 100-44-7
2.6 NAERG Guide No.: 156
2.7 Standard Industrial Trade Classification: 51129

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Chemical safety goggles or face shield; self-contained breathing apparatus, positive-pressure hose mask, air-line mask, industrial canister-type gas mask, or chemical cartridge respirator; rubber gloves; protective clothing.

3.2 Symptoms Following Exposure: Inhalation causes severe irritation of upper respiratory tract with coughing, burning of the throat, headache, dizziness, and weakness; lung damage and pulmonary edema may occur after severe exposure; chronic irritation of the upper respiratory tract may occur after prolonged and repeated exposure to vapors. Immediate and severe eye irritation may result from contact with the liquid or vapors; prolonged or permanent eye damage may result. Vapors irritate skin, and liquid may cause severe burns. Ingestion may cause immediate and severe burns of the mouth, throat, and gastrointestinal tract; nausea, vomiting, cramps, and diarrhea may follow; gastrointestinal damage and systemic effects may result.

3.3 Treatment of Exposure: INHALATION: remove from contaminated atmosphere; if breathing has ceased, start mouth-to-mouth resuscitation; oxygen, if available, should be administered only by an experienced person when authorized by a physician; keep patient warm and comfortable; call a physician immediately. EYES: immediately flush with large quantities of running water for a minimum of 15 min.; hold eyelids apart during irrigation to insure flushing of the entire surface of the eye and lids with water; do not attempt to neutralize with chemical agents; obtain medical attention as soon as possible; oils or ointments should not be used unless directed by a physician; continue irrigation for an additional 15 min. if physician is not available. SKIN: immediately flush affected areas with water; remove contaminated clothing under shower; continue washing with water; do not attempt to neutralize with chemical agents; obtain medical attention if irritation persists. INGESTION: give large amounts of water; do NOT induce vomiting.

3.4 TLV-TWA: 1 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 2; oral rat LD_{50} = 1,231 mg/kg
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.
3.11 Liquid or Solid Characteristics: Severe skin irritant. Causes second-and third-degree burns on short contact and is very injurious to the eyes.
3.12 Odor Threshold: 0.047 ppm
3.13 IDLH Value: 10 ppm
3.14 OSHA PEL-TWA: Not listed.
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: 165°F O.C. 140°F C.C.
4.2 Flammable Limits in Air: 1.1% (LFL)
4.3 Fire Extinguishing Agents: Water, dry chemical, foam, and carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Irritating hydrogen chloride gas may form.
4.6 Behavior in Fire: Forms vapor that is a powerful tear gas.
4.7 Auto Ignition Temperature: 1,161°F
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: 4.2 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 40.5 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 11.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Undergoes slow hydrolysis, liberating hydrogen chloride (hydrochloric acid).
5.2 Reactivity with Common Materials: Decomposes rapidly in the presence of all common metals (with the exception of nickel and lead), liberating heat and hydrogen chloride.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Rinse with sodium bicarbonate or lime solution.
5.5 Polymerization: Polymerizes with evolution of heat and hydrogen chloride when in contact with all common metals except nickel and lead.
5.6 Inhibitor of Polymerization: Triethylamine, propylene oxide, or sodium carbonate.

6. WATER POLLUTION

6.1 Aquatic Toxicity:
0.05 mg/l/*/marine fish/no irritant response/salt water
0.1 mg/l/*/marine fish/violent irritant activity/salt water
*Time period not specified.
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 3
Human Oral hazard: 1
Human Contact hazard: II
Reduction of amenities: XXX

7. SHIPPING INFORMATION

7.1 Grades of Purity: 98.5+%, either anhydrous or stabilized
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Pressure-vacuum
7.5 IMO Pollution Category: B
7.6 Ship Type: 2
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Poison
8.2 49 CFR Class: 6.1
8.3 49 CFR Package Group: II
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	2
Flammability (Red).....	2
Instability (Yellow).....	1

8.6 EPA Reportable Quantity: 100 pounds
8.7 EPA Pollution Category: B
8.8 RCRA Waste Number: P028
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 126.6
9.3 Boiling Point at 1 atm: 354.9°F = 179.4°C = 452.6°K
9.4 Freezing Point: –38.6°F = –39.2°C = 234.0°K
9.5 Critical Temperature: (est.) 772°F = 411°C = 684°K
9.6 Critical Pressure: (est.) 567 psia = 38.5 atm = 3.91 MN/m^2
9.7 Specific Gravity: 1.10 at 25°C (liquid)
9.8 Liquid Surface Tension: 37.5 dynes/cm = 0.0375 N/m at 20°C
9.9 Liquid Water Interfacial Tension: (est.) 30 dynes/cm = 0.030 N/m at 20°C
9.10 Vapor (Gas) Specific Gravity: 4.36
9.11 Ratio of Specific Heats of Vapor (Gas): 1.0689
9.12 Latent Heat of Vaporization: 130 Btu/lb = 70 cal/g = 2.9 X 10^5 J/kg
9.13 Heat of Combustion: –12,000 Btu/lb = –6,700 cal/g = –280 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 0.07 psia

NOTES

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9.20 SATURATED LIQUID DENSITY	
Temperature (degrees F)	Pounds per cubic foot
40	70.200
50	69.790
60	69.370
70	68.959
80	68.540
90	68.120
100	67.709
110	67.290
120	66.870
130	66.459
140	66.040
150	65.629
160	65.209
170	64.790
180	64.379
190	63.960
200	63.550
210	63.130

9.21 LIQUID HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
40	0.321
50	0.323
60	0.325
70	0.327
80	0.329
90	0.331
100	0.332
110	0.334
120	0.336
130	0.338
140	0.340
150	0.342
160	0.343
170	0.345
180	0.347
190	0.349
200	0.351
210	0.353

9.22 LIQUID THERMAL CONDUCTIVITY	
Temperature (degrees F)	British thermal unit inch per hour-square foot-F
40	0.910
50	0.908
60	0.906
70	0.904
80	0.902
90	0.901
100	0.899
110	0.897
120	0.895
130	0.893
140	0.892
150	0.890
160	0.888
170	0.886
180	0.884
190	0.883
200	0.881
210	0.879

9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Centipoise
55	1.544
60	1.477
65	1.413
70	1.354
75	1.298
80	1.245
85	1.195
90	1.148
95	1.104
100	1.062
105	1.023
110	0.985
115	0.950
120	0.917
125	0.885
130	0.855
135	0.826
140	0.799
145	0.773
150	0.748
155	0.724
160	0.702
165	0.681
170	0.660
175	0.641

9.24 SOLUBILITY IN WATER	
Temperature (degrees F)	Pounds per 100 pounds of water
77	0.003

9.25 SATURATED VAPOR PRESSURE	
Temperature (degrees F)	Pounds per square inch
70	0.021
80	0.030
90	0.042
100	0.057
110	0.078
120	0.105
130	0.140
140	0.184
150	0.241
160	0.312
170	0.401
180	0.511
190	0.647
200	0.813
210	1.014
220	1.258
230	1.550
240	1.899
250	2.312
260	2.801
270	3.375
280	4.046
290	4.827
300	5.733
310	6.777
320	7.978

9.26 SATURATED VAPOR DENSITY	
Temperature (degrees F)	Pounds per cubic foot
70	0.00047
80	0.00066
90	0.00089
100	0.00121
110	0.00161
120	0.00213
130	0.00279
140	0.00362
150	0.00466
160	0.00594
170	0.00751
180	0.00942
190	0.01174
200	0.01453
210	0.01787
220	0.02183
230	0.02651
240	0.03200
250	0.03843
260	0.04590
270	0.05455
280	0.06451
290	0.07594
300	0.08900
310	0.10380
320	0.12070

9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
0	0.218
25	0.227
50	0.237
75	0.246
100	0.255
125	0.264
150	0.274
175	0.283
200	0.292
225	0.301
250	0.311
275	0.320
300	0.329
325	0.338
350	0.348
375	0.357
400	0.366
425	0.375
450	0.385
475	0.394
500	0.403
525	0.412
550	0.422
575	0.431
600	0.440