BENZALDEHYDE

BZD

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Watery liquid	Colorless to pale yellow	Bitter almond odor
Benzoic aldehyde Oil of bitter almond	May float or sink in water.		

Keep people away.
Avoid contact with liquid.
Call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Combustible.
Extinguish with water, dry chemical, foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.
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 and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
Fouling to shoreline.
May be dangerous if it enters water intakes.
Notify local health and pollution control officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Contain
Collection Systems: Skim; Pump; Dredge
Clean shore line
Salvage waterfowl

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: C_6H_5CHO
2.3 IMO/UN Designation: 3.3/1990
2.4 DOT ID No.: 1990
2.5 CAS Registry No.: 100-52-7
2.6 NAERG Guide No.: 129
2.7 Standard Industrial Trade Classification: 51622

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Chemical goggles and protective clothing.
3.2 Symptoms Following Exposure: Inhalation of concentrated vapor may irritate eyes, nose and throat. Liquid is irritating to the eyes. Prolonged contact with the skin may cause irritation.
3.3 Treatment of Exposure: SKIN, EYE CONTACT: move victim to fresh air. Call physician immediately. Wash contaminated skin area with water. Flush eyes with plenty of water for at least 15 min. INGESTION: induce vomiting. Call a physician.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 2; LD_{50} = 0.5 to 5 g/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: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
3.12 Odor Threshold: 0.042 ppm.
3.13 IDLH Value: Not listed.
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. 148°F C.C.
4.2 Flammable Limits in Air: Currently not available
4.3 Fire Extinguishing Agents: Water spray, foam, carbon dioxide or dry chemical.
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Not pertinent
4.7 Auto Ignition Temperature: 378°F
4.8 Electrical Hazards: Not pertinent
4.9 Burning Rate: 3.8 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 38.1 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 10.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: No reaction
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 50%, 10 days 150%, 5 days
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: T
Damage to living resources: 3
Human Oral hazard: 3
Human Contact hazard: I
Reduction of amenities: X

7. SHIPPING INFORMATION

7.1 Grades of Purity: Technical grade-98.0% NF (FCC) grade-98.0%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: Inerted
7.4 Venting: Currently not available
7.5 IMO Pollution Category: Currently not available
7.6 Ship Type: Currently not available
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Class 9
8.2 49 CFR Class: 9
8.3 49 CFR Package Group: III
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	2
Flammability (Red).....	2
Instability (Yellow).....	0

8.6 EPA Reportable Quantity: Not listed.
8.7 EPA Pollution Category: Not listed.
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 106.12
9.3 Boiling Point at 1 atm: 354°F = 179°C = 452°K
9.4 Freezing Point: Not pertinent
9.5 Critical Temperature: 665.6°F = 352°C = 625.2°K
9.6 Critical Pressure: 316 psia = 21.5 atm = 2.18 MN/m^2
9.7 Specific Gravity: 1.046 at 20°C (liquid)
9.8 Liquid Surface Tension: 40.0 dynes/cm = 0.040 N/m at 20°C
9.9 Liquid Water Interfacial Tension: 15.5 dynes/cm = 0.0155 N/m at 20°C
9.10 Vapor (Gas) Specific Gravity: 3.66
9.11 Ratio of Specific Heats of Vapor (Gas): 1.1
9.12 Latent Heat of Vaporization: 156 Btu/lb = 86.5 cal/g = 3.62 X 10^5 J/kg
9.13 Heat of Combustion: –13,730 Btu/lb = –7630 cal/g = –319.5 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: Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY

Temperature (degrees F)	Pounds per cubic foot
40	66.049
50	65.740
60	65.440
70	65.129
80	64.820
90	64.520
100	64.209
110	63.900
120	63.590
130	63.280
140	62.970
150	62.660
160	62.350
170	62.040
180	61.730
190	61.410
200	61.100
210	60.790

9.21 LIQUID HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
52	0.428
54	0.428
56	0.428
58	0.428
60	0.428
62	0.428
64	0.428
66	0.428
68	0.428
70	0.428
72	0.428
74	0.428
76	0.428
78	0.428
80	0.428
82	0.428
84	0.428
86	0.428
88	0.428
90	0.428
92	0.428
94	0.428
96	0.428
98	0.428
100	0.428
102	0.428

9.22 LIQUID THERMAL CONDUCTIVITY

Temperature (degrees F)	British thermal unit inch per hour-square foot-F
55	1.060
60	1.053
65	1.047
70	1.040
75	1.033
80	1.026
85	1.020
90	1.013
95	1.006
100	1.000
105	0.993
110	0.986
115	0.979
120	0.973
125	0.966
130	0.959
135	0.952
140	0.946
145	0.939
150	0.932

9.23 LIQUID VISCOSITY

Temperature (degrees F)	Centipoise
52	2.643
54	2.502
56	2.369
58	2.245
60	2.128
62	2.018
64	1.914
66	1.817
68	1.725
70	1.638
72	1.556
74	1.479
76	1.407
78	1.338
80	1.273
82	1.212
84	1.154
86	1.100
88	1.048
90	0.999
92	0.953
94	0.909

9.24 SOLUBILITY IN WATER

Temperature (degrees F)	Pounds per 100 pounds of water
77	0.300

9.25 SATURATED VAPOR PRESSURE

Temperature (degrees F)	Pounds per square inch
55	0.005
60	0.007
65	0.009
70	0.011
75	0.013
80	0.017
85	0.021
90	0.025
95	0.031
100	0.038
105	0.046
110	0.056
115	0.068
120	0.082
125	0.098
130	0.117
135	0.140
140	0.167
145	0.198
150	0.234
155	0.277
160	0.326
165	0.383
170	0.448
175	0.523

9.26 SATURATED VAPOR DENSITY

Temperature (degrees F)	Pounds per cubic foot
55	0.00010
60	0.00013
65	0.00016
70	0.00020
75	0.00025
80	0.00031
85	0.00037
90	0.00046
95	0.00055
100	0.00067
105	0.00081
110	0.00097
115	0.00116
120	0.00139
125	0.00166
130	0.00197
135	0.00233
140	0.00275
145	0.00324
150	0.00380
155	0.00445
160	0.00520
165	0.00605
170	0.00703
175	0.00815

9.27 IDEAL GAS HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
0	0.201
25	0.213
50	0.224
75	0.235
100	0.246
125	0.257
150	0.267
175	0.277
200	0.287
225	0.297
250	0.307
275	0.316
300	0.326
325	0.335
350	0.344
375	0.352
400	0.361
425	0.369
450	0.377
475	0.385
500	0.393
525	0.401
550	0.408
575	0.416
600	0.423