DICHLOROBUTENE

DCB

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
2-Butylene dichloride
1,4-Dichloro-2-butene
cis-1,4-Dichloro-2-butene
trans-1,4-Dichloro-2-butene
1,4-Dichloro-2-butylene

Liquid Colorless Sweet odor

Sinks and mixes slowly with water.

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

Fire

FLAMMABLE
POISONOUS GASES ARE PRODUCED IN FIRE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
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
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.
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: Not listed.
2.2 Formula: $ClCH_2CH = CHCH_2Cl$
2.3 IMO/UN Designation: 8/1760
2.4 DOT ID No.: 2920
2.5 CAS Registry No.: 764-41-0
2.6 NAERG Guide No.: 132
2.7 Standard Industrial Trade Classification: 51138

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Rubber gloves; chemical splash goggles; rubber boots and apron; barrier cream; organic canister mask.
3.2 Symptoms Following Exposure: Inhalation of vapor irritates nose and throat. Contact with eyes causes intense irritation and tears. Contact of liquid with skin causes severe blistering and dermatitis. Ingestion causes severe irritation of mouth and stomach.
3.3 Treatment of Exposure: INHALATION: remove from exposure; provide low-pressure oxygen if required; keep under observation until edema is ruled out. EYES: irrigate immediately for 15 min.; call physician. SKIN: wash immediately and thoroughly with soap and water; treat as a chemical burn. INGESTION: induce vomiting; call physician.
3.4 TLV-TWA: 0.005 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 3; oral LD_{50} = 89 mg/kg (rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Currently not available
3.11 Liquid or Solid Characteristics: Currently not available
3.12 Odor Threshold: Currently not available
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: Currently not available
4.2 Flammable Limits in Air: 1.5%-4%
4.3 Fire Extinguishing Agents: Water, foam, dry chemical or carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Decomposition vapors contain phosgene and hydrogen chloride gases; both are toxic and irritating.
4.6 Behavior in Fire: Not pertinent
4.7 Auto Ignition Temperature: Currently not available
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: 2.6 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 23.8 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 8.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Reacts slowly to form hydrochloric acid.
5.2 Reactivity with Common Materials: Corrodes metal when wet.
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): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile: Not listed

7. SHIPPING INFORMATION

7.1 Grades of Purity: Cis-trans equilibrium mixture, 98+%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Open (flame arrester)
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: Corrosive material
8.2 49 CFR Class: 8
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification: Not listed
8.6 EPA Reportable Quantity: 1 pound
8.7 EPA Pollution Category: X
8.8 RCRA Waste Number: U074
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: 125.0
9.3 Boiling Point at 1 atm: 313°F = 156°C = 429°K
9.4 Freezing Point: cis: –54°F = –48°C = 225°K trans: 37°F = 3°C = 276°K
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.112 at 20°C (liquid)
9.8 Liquid Surface Tension: (est.) 24 dynes/cm = 0.024 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
9.11 Ratio of Specific Heats of Vapor (Gas): 1.0874
9.12 Latent Heat of Vaporization: (est.) 130 Btu/lb = 73 cal/g = 3.1×10^5 J/kg
9.13 Heat of Combustion: –17,500 Btu/lb = –9,720 cal/g = -407×10^5 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
42	70.179
44	70.110
46	70.040
48	69.969
50	69.900
52	69.830
54	69.759
56	69.700
58	69.629
60	69.559
62	69.490
64	69.419
66	69.349
68	69.280
70	69.209
72	69.139
74	69.070
76	69.000
78	68.929
80	68.860
82	68.790
84	68.719

9.21 LIQUID HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
42	0.386
44	0.387
46	0.388
48	0.389
50	0.390
52	0.391
54	0.392
56	0.393
58	0.394
60	0.396
62	0.397
64	0.398
66	0.399
68	0.400
70	0.401
72	0.402
74	0.403
76	0.404
78	0.406
80	0.407
82	0.408
84	0.409
86	0.410

9.22 LIQUID THERMAL CONDUCTIVITY

Temperature (degrees F)	British thermal unit inch per hour-square foot-F
51	1.048
52	1.048
53	1.048
54	1.048
55	1.048
56	1.048
57	1.048
58	1.048
59	1.048
60	1.048
61	1.048
62	1.048
63	1.048
64	1.048
65	1.048
66	1.048
67	1.048
68	1.048

9.23 LIQUID VISCOSITY

Temperature (degrees F)	Centipoise
51	1.249
52	1.238
53	1.227
54	1.216
55	1.205
56	1.194
57	1.184
58	1.173
59	1.163
60	1.153
61	1.143
62	1.133
63	1.123
64	1.113
65	1.104
66	1.094
67	1.085
68	1.076
69	1.066
70	1.057
71	1.048
72	1.040
73	1.031
74	1.022
75	1.014
76	1.006

9.24 SOLUBILITY IN WATER

Temperature (degrees F)	Pounds per 100 pounds of water
77	0.200

9.25 SATURATED VAPOR PRESSURE

Temperature (degrees F)	Pounds per square inch
180	1.166
185	1.307
190	1.463
195	1.634
200	1.823
205	2.030
210	2.257
215	2.505
220	2.777
225	3.073
230	3.395
235	3.747
240	4.128
245	4.543
250	4.992
255	5.479
260	6.005
265	6.573
270	7.186
275	7.847
280	8.559
285	9.324
290	10.150
295	11.030
300	11.970
305	12.990

9.26 SATURATED VAPOR DENSITY

Temperature (degrees F)	Pounds per cubic foot
180	0.02122
185	0.02361
190	0.02622
195	0.02907
200	0.03218
205	0.03556
210	0.03924
215	0.04324
220	0.04757
225	0.05226
230	0.05733
235	0.06281
240	0.06871
245	0.07507
250	0.08191
255	0.08927
260	0.09716
265	0.10560
270	0.11470
275	0.12440
280	0.13470
285	0.14580
290	0.15760
295	0.17020
300	0.18350
305	0.19770

9.27 IDEAL GAS HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
0	0.179
20	0.185
40	0.190
60	0.196
80	0.201
100	0.206
120	0.211
140	0.216
160	0.221
180	0.226
200	0.230
220	0.235
240	0.240
260	0.244
280	0.248
300	0.253
320	0.257
340	0.261
360	0.266
380	0.270
400	0.274
420	0.278
440	0.281