

BETA-PROPIOLACTONE

PLT

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Betraprone Hydracrylic acid, beta-lactone 2-Oxetanone Propanolide beta-Propionolactone		Liquid Colorless Irritating odor
Mixes with water.		
Evacuate. KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID. Wear rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies. Protect water intakes.		
Fire	Combustible. Containers may explode in fire. Extinguish with water, dry chemicals, foam, or carbon dioxide. Cool exposed containers with water.	
Exposure	CALL FOR MEDICAL AID. LIQUID POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED. Irritating to skin and eyes. 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
 Dilute and disperse
 Do not burn

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
 2.2 **Formula:** OCH₂CH₂CO
 2.3 **IMO/UN Designation:** Not listed
 2.4 **DOT ID No.:** Not listed
 2.5 **CAS Registry No.:** 57-57-8
 2.6 **NAERG Guide No.:** Not listed
 2.7 **Standard Industrial Trade Classification:** 51628

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Air mask or organic canister mask; goggles or face shield; rubber gloves; protective clothing to prevent all contact with skin.
- 3.2 **Symptoms Following Exposure:** Inhalation causes irritation of nose, throat, and respiratory tract. Contact of liquid with eyes causes irritation and tears. Contact with skin causes irritation and blistering. Ingestion causes burns of mouth and stomach.
- 3.3 **Treatment of Exposure:** Get medical attention following all exposures to this compound. INHALATION: move victim to fresh air; if breathing has stopped, give artificial respiration. EYES: flush continuously with water for at least 15 min. SKIN: flush with water; if blistering occurs, alert physician to fact that fluid from blister will cause additional blistering of adjacent skin. INGESTION: give large amount of water and induce vomiting.
- 3.4 **TLV-TWA:** 0.05 ppm
 3.5 **TLV-STEL:** Not listed.
 3.6 **TLV-Ceiling:** Not listed.
 3.7 **Toxicity by Ingestion:** Grade 3; oral LD₅₀ = 50 mg/kg (rat)
 3.8 **Toxicity by Inhalation:** Currently not available.
 3.9 **Chronic Toxicity:** Because of the high incidence of cancer, either in man or animals, no exposure or contact by any route-respiratory, oral, or skin-should be permitted.
 3.10 **Vapor (Gas) Irritant Characteristics:** Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations.
 3.11 **Liquid or Solid Characteristics:** Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes' contact.
 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:** 165°F C.C.
 4.2 **Flammable Limits in Air:** 2.9% (LFL)
 4.3 **Fire Extinguishing Agents:** Water, dry chemical, foam, carbon dioxide
 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
 4.5 **Special Hazards of Combustion Products:** Vapors of unburned material are very toxic.
 4.6 **Behavior in Fire:** Containers may explode.
 4.7 **Auto Ignition Temperature:** Currently not available
 4.8 **Electrical Hazards:** Currently not available
 4.9 **Burning Rate:** Currently not available
 4.10 **Adiabatic Flame Temperature:** Currently not available
 4.11 **Stoichiometric Air to Fuel Ratio:** 14.3 (calc.)
 4.12 **Flame Temperature:** Currently not available
 4.13 **Combustion Molar Ratio (Reactant to Product):** 5.0 (calc.)
 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Slow, non-hazardous reaction to form beta-hydroxypropionic acid
 5.2 **Reactivity with Common Materials:** Not pertinent
 5.3 **Stability During Transport:** Stable
 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
 5.5 **Polymerization:** Can polymerize and rupture container, especially at elevated temperatures. At 22°C, 0.04% polymerizes each day.
 5.6 **Inhibitor of Polymerization:** None used

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:**
 Bioaccumulation: 0
 Damage to living resources: 1
 Human Oral hazard: 2
 Reduction of amenities: XXX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 97+%
 7.2 **Storage Temperature:** Below 60°F
 7.3 **Inert Atmosphere:** No requirement
 7.4 **Venting:** Pressure-vacuum
 7.5 **IMO Pollution Category:** D
 7.6 **Ship Type:** 2
 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed
 8.2 **49 CFR Class:** Not pertinent
 8.3 **49 CFR Package Group:** Not listed.
 8.4 **Marine Pollutant:** No
 8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 0 |
| Flammability (Red)..... | 2 |
| Instability (Yellow)..... | 0 |
- 8.6 **EPA Reportable Quantity:** 10 pounds
 8.7 **EPA Pollution Category:** A
 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:** 72.1
 9.3 **Boiling Point at 1 atm:** Not pertinent (decomposes)
 9.4 **Freezing Point:** -28.1°F = -33.4°C = 239.8°K
 9.5 **Critical Temperature:** Not pertinent
 9.6 **Critical Pressure:** Not pertinent
 9.7 **Specific Gravity:** 1.148 at 20°C (liquid)
 9.8 **Liquid Surface Tension:** (est.) 22 dynes/cm = 0.022 N/m at 20°C
 9.9 **Liquid Water Interfacial Tension:** (est.) 25 dynes/cm = 0.025 N/m at 20°C
 9.10 **Vapor (Gas) Specific Gravity:** 2.5
 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.1089
 9.12 **Latent Heat of Vaporization:** Not pertinent
 9.13 **Heat of Combustion:** -8,510 Btu/lb = -4,730 cal/g = -198 X 10³ J/kg
 9.14 **Heat of Decomposition:** Not pertinent
 9.15 **Heat of Solution:** Not pertinent
 9.16 **Heat of Polymerization:** Currently not available
 9.17 **Heat of Fusion:** Currently not available
 9.18 **Limiting Value:** Currently not available
 9.19 **Reid Vapor Pressure:** Currently not available

NOTES

BETA-PROPIOLACTONE

PLT

9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
34	72.959	42	0.406	51	1.048	51	0.954
36	72.900	44	0.407	52	1.048	52	0.945
38	72.830	46	0.408	53	1.048	53	0.937
40	72.759	48	0.409	54	1.048	54	0.928
42	72.690	50	0.410	55	1.048	55	0.920
44	72.620	52	0.411	56	1.048	56	0.912
46	72.549	54	0.412	57	1.048	57	0.904
48	72.480	56	0.413	58	1.048	58	0.896
50	72.410	58	0.414	59	1.048	59	0.888
52	72.339	60	0.416	60	1.048	60	0.880
54	72.270	62	0.417	61	1.048	61	0.872
56	72.200	64	0.418	62	1.048	62	0.865
58	72.129	66	0.419	63	1.048	63	0.857
60	72.059	68	0.420	64	1.048	64	0.850
62	71.990	70	0.421	65	1.048	65	0.842
64	71.919	72	0.422	66	1.048	66	0.835
66	71.849	74	0.423	67	1.048	67	0.828
68	71.790	76	0.424	68	1.048	68	0.821
70	71.719			69	1.048	69	0.814
72	71.650			70	1.048	70	0.807
74	71.580			71	1.048	71	0.800
76	71.509			72	1.048	72	0.794
78	71.440			73	1.048	73	0.787
80	71.370			74	1.048	74	0.780
82	71.299			75	1.048	75	0.774
84	71.230			76	1.048	76	0.768

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
77	68.000	88	0.089	88	0.00109	0	0.257
		90	0.093	90	0.00114	25	0.266
		92	0.098	92	0.00119	50	0.274
		94	0.103	94	0.00125	75	0.283
		96	0.108	96	0.00130	100	0.291
		98	0.113	98	0.00136	125	0.299
		100	0.118	100	0.00142	150	0.308
		102	0.124	102	0.00148	175	0.315
		104	0.130	104	0.00155	200	0.323
		106	0.136	106	0.00161	225	0.331
		108	0.142	108	0.00168	250	0.338
		110	0.149	110	0.00175	275	0.346
		112	0.155	112	0.00183	300	0.353
		114	0.162	114	0.00190	325	0.360
		116	0.170	116	0.00198	350	0.367
		118	0.177	118	0.00206	375	0.374
		120	0.185	120	0.00215	400	0.380
		122	0.193	122	0.00223	425	0.387
		124	0.202	124	0.00232	450	0.393
		126	0.210	126	0.00241	475	0.399
		128	0.220	128	0.00251	500	0.405
		130	0.229	130	0.00261	525	0.411
		132	0.239	132	0.00271	550	0.417
		134	0.249	134	0.00281	575	0.423
		136	0.259	136	0.00292	600	0.428
		138	0.270	138	0.00303		