ETHYL PHOSPHORODICHLORIDATE

EPP

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
Ethyl dichlorophosphate
Phosphorodichloridic acid, ethyl ester

Liquid Colorless Choking odor

Reacts with water. Irritating gas is produced on contact with water.

KEEP PEOPLE AWAY.
Avoid inhalation.
AVOID CONTACT WITH LIQUID AND VAPOR.
Wear goggles, self-contained breathing apparatus and rubber overclothing (including gloves).
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Fire data not available.

Exposure

Call for medical aid.

VAPOR
Irritating to eyes, nose and throat.
Harmful if inhaled.
Move victim to fresh air.
If breathing is difficult, give oxygen.

LIQUID
Will burn 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.
DO NOT INDUCE VOMITING.

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

Dilute and disperse
Stop discharge
Collection Systems: Pump
Chemical and Physical Treatment:
Neutralize

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $Cl_2(OC_2H_5)PO$
2.3 IMO/UN Designation: 8/1760
2.4 DOT ID No.: 2927
2.5 CAS Registry No.: Currently not available
2.6 NAERG Guide No.: 154
2.7 Standard Industrial Trade Classification: 51631

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Goggles and face shield; self-contained or air-line respirator; rubber gloves, boots, and clothing.
3.2 Symptoms Following Exposure: Inhalation of vapor irritates nose and throat. Contact with liquid causes severe burns of eyes and skin. Ingestion causes severe burns of mouth and stomach.
3.3 Treatment of Exposure: INHALATION: remove victim from exposure; if his breathing has stopped, start artificial respiration, call a doctor. EYES: flush with water for at least 15 min.; get medical attention for burns. SKIN: flush with water; get medical attention for burns. INGESTION: do NOT induce vomiting; give large amounts of water, followed by milk or milk of magnesia.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Currently not available
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: Currently not available
4.3 Fire Extinguishing Agents: Dry chemical or carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Water or foam
4.5 Special Hazards of Combustion Products: Irritating fumes of hydrogen chloride and phosphoric acid may be formed.
4.6 Behavior in Fire: Contact with water applied to adjacent fires produces irritating fumes of hydrogen chloride.
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 Stoichometric Air to Fuel Ratio: 16.7 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 6.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Reacts with water to evolve hydrogen chloride (hydrochloric acid).
5.2 Reactivity with Common Materials: Will react with surface moisture to evolve hydrogen chloride, which is corrosive to common metals.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Flood with water, rinse with sodium bicarbonate or lime solution.
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: 97%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Pressure-vacuum
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: Poison
8.2 49 CFR Class: 6.1
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification: Not listed
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: 162.9
9.3 Boiling Point at 1 atm: 333°F = 167°C = 440°K
9.4 Freezing Point: Not pertinent
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.35 at 19°C (liquid)
9.8 Liquid Surface Tension: (est.) 32.8 dynes/cm = 0.0328 N/m at 20°C
9.9 Liquid Water Interfacial Tension: Not pertinent
9.10 Vapor (Gas) Specific Gravity: Not pertinent
9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
9.12 Latent Heat of Vaporization: Not pertinent
9.13 Heat of Combustion: (est.) –4,700 Btu/lb = –2,600 cal/g = -110×10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Currently not available
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		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
52	84.759	51	0.500	51	1.129	51	9.018
54	84.690	52	0.500	52	1.129	52	8.773
56	84.620	53	0.500	53	1.129	53	8.535
58	84.549	54	0.500	54	1.129	54	8.305
60	84.480	55	0.500	55	1.129	55	8.082
62	84.419	56	0.500	56	1.129	56	7.865
64	84.349	57	0.500	57	1.129	57	7.656
66	84.280	58	0.500	58	1.129	58	7.452
68	84.209	59	0.500	59	1.129	59	7.255
70	84.139	60	0.500	60	1.129	60	7.064
72	84.070	61	0.500	61	1.129	61	6.879
74	84.000	62	0.500	62	1.129	62	6.699
76	83.929	63	0.500	63	1.129	63	6.524
78	83.860	64	0.500	64	1.129	64	6.355
80	83.790	65	0.500	65	1.129	65	6.190
82	83.719	66	0.500	66	1.129	66	6.031
84	83.650	67	0.500	67	1.129	67	5.876
86	83.580	68	0.500	68	1.129	68	5.726
		69	0.500	69	1.129	69	5.580
		70	0.500	70	1.129	70	5.438
		71	0.500	71	1.129	71	5.301
		72	0.500	72	1.129	72	5.167
		73	0.500	73	1.129	73	5.037
		74	0.500	74	1.129	74	4.911
		75	0.500	75	1.129	75	4.789
		76	0.500	76	1.129	76	4.670

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
	R	285	6.803	285	0.13860		N
	E	290	7.410	290	0.15000		O
	A	295	8.062	295	0.16210		T
	C	300	8.761	300	0.17500		
	T	305	9.511	305	0.18880		P
	S	310	10.310	310	0.20340		E
		315	11.170	315	0.21890		R
		320	12.090	320	0.23530		T
		325	13.070	325	0.25280		I
		330	14.120	330	0.27130		N
		335	15.230	335	0.29090		E
		340	16.420	340	0.31160		N
		345	17.680	345	0.33350		T
		350	19.030	350	0.35660		
		355	20.450	355	0.38100		