ZINC FORMATE

ZFM

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
Formic acid, zinc salt

Solid crystals White

Sinks and mixes with water.

Wear goggles, self-contained breathing apparatus and rubber gloves.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Fire data not available.

Exposure

CALL FOR MEDICAL AID.

SOLID
Irritating to skin and eyes.
If swallowed may cause nausea and vomiting.
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.

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

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $Zn(HCOO)_2$ $2H_2O$ $Zn(CHO_2)_2$
2.3 IMO/UN Designation: Not listed
2.4 DOT ID No.: Not listed
2.5 CAS Registry No.: 557-41-5
2.6 NAERG Guide No.: 171
2.7 Standard Industrial Trade Classification: 51374

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Approved respirator, rubber gloves, and safety goggles.
3.2 Symptoms Following Exposure: EYES: May cause corneal opacity, iritis, conjunctivitis. SKIN: May be irritating. INGESTION: Nausea and vomiting.
3.3 Treatment of Exposure: See a physician. EYES: Wash with copious amounts of water. SKIN: Wash with soap and water. INGESTION: Give 3 to 4 glasses of water, induce vomiting and consult 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: 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: Water, CO_2, Dry chemical, Foam, or CCl_4
4.4 Fire Extinguishing Agents Not to Be Used: None
4.5 Special Hazards of Combustion Products: Currently not available
4.6 Behavior in Fire: Moderate hazard. May emit toxic fumes of zinc compounds.
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: Not pertinent.
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): Not pertinent.
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: Liquid
5.4 Neutralizing Agents for Acids and Caustics: Neutralize with sodium hydroxide.
5.5 Polymerization: Will not occur.
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity:
96-hour TL_{50} values ranged from 4.7 to 35.5 mg Zn/l.
24-hour TL_m for Bluegill is 175 ppm (formate).
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 62.4 mg/l Zn will cause a 50% drop in the 5 day BOD. 0.27 lb/lb, 5 days (formate)
6.4 Food Chain Concentration Potential: Zn may accumulate slightly.
6.5 GESAMP Hazard Profile: Not listed

7. SHIPPING INFORMATION

7.1 Grades of Purity: Currently not available
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: Currently not available
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: 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: Not listed
8.6 EPA Reportable Quantity: 1000 pounds
8.7 EPA Pollution Category: C
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Solid
9.2 Molecular Weight: 191.45 Dihydrate; 155.41 anhydrous
9.3 Boiling Point at 1 atm: Decomposes Loses 2 H_2O at 140°C
9.4 Freezing Point: Currently not available
9.5 Critical Temperature: Currently not available
9.6 Critical Pressure: Currently not available
9.7 Specific Gravity: 2.207 at 20°C dihydrate 2.368 anhydrous
9.8 Liquid Surface Tension: Not pertinent
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: Currently not available
9.14 Heat of Decomposition: Currently not available
9.15 Heat of Solution: Exothermic –46.3 Btu/lb = –25.7 cal/g = -1.08×10^5 J/kg at 25°C –52 Btu/lb =–29 cal/g = 1.2×10^5 J/kg at 15°C
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
	NOT PERTINENT		NOT PERTINENT		NOT PERTINENT		NOT PERTINENT

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
70	5.656		NOT PERTINENT		NOT PERTINENT		NOT PERTINENT
80	7.933						
90	10.211						
100	12.489						
110	14.767						
120	17.044						
130	19.322						
140	21.600						
150	23.878						
160	26.156						
170	28.433						
180	30.711						
190	32.989						
200	35.267						
210	37.544						