1,2-BUTYLENE OXIDE

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
1,2-Butylene oxide
Butoxylenes
Butoxylenes oxide
1,2-Epoxybutane

Liquid
Colorless
Sharp odor
Mixes with water.

Restrict access.
Evacuate.
Shut off ignition sources.  Call fire department.
Avoid contact with liquid and vapor.
Wear rubber overclothing (including gloves).
Stay upwind.  Use water spray to "knock down" vapor.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Edgewise with dry chemicals, foam, or carbon dioxide.
Water may be ineffective on fire.

Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled will cause coughing or difficult breathing.
If in eyes, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
If swallowed will cause nausea and vomiting.
Remove contaminated clothing and shoes.
Flash 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.

Notify local health and wildlife officials.

May be dangerous if it enters water intakes.
Effect of low concentrations on aquatic life is unknown.

Notify operators of nearby water intakes.

Ingestion causes irritation of mouth and stomach.
Contact with either liquid

Flush affected areas with plenty of water.
If swallowed will cause nausea and vomiting.
Notify operators of nearby water intakes.

If in eyes, hold eyelids open and flush with plenty of water.

Inhalation

Irritating to eyes, nose and throat.

If inhaled will cause coughing or difficult breathing.
If in eyes, hold eyelids open and flush with plenty of water.

Cool exposed containers with water.

Wear rubber overclothing (including gloves).

Avoid contact with liquid and vapor.

Evacuate.
Restrict access.

Notify local health and pollution control agencies.

1. CORRECTIVE RESPONSE ACTIONS

Discharge or vapor may cause burns of eyes. Liquid produces frostbite-type of skin burn if free to evaporate;
 occur at higher levels.  Ingestion causes irritation of mouth and stomach.  Contact with either liquid
 or vapor may cause burns of eyes. Liquid produces frostbite-type of skin burn if free to evaporate;

Water Pollution

Notify local health and wildlife officials.

Notify operators of nearby water intakes.

1.1 Personal Protective Equipment: Clean protective clothing; rubber gloves; chemical worker's gogoggles;

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 16; Alkyene oxide

2.2 Formula: C5H8O

2.3 IMDG Designation: Not listed

2.4 DOT ID No.: 3022

2.5 CAS Registry No.: 106-88-7

2.6 NAHRG Guide No.: 127P

2.7 Standard Industrial Trade Classification: 51615

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Chemical and Physical Treatment: Burn

3.2 Symptoms Following Exposure: Inhalaion: irritant odor and irritation; respiratory injury may

3.3 Treatment of Exposure: INHALATION: If any ill effects occur, immediately remove person to fresh air

3.4 TLV-TWA: Not listed

3.5 TLV-STEEL: Not listed.

3.6 TLV-Cutting: Not listed

3.7 Toxicity by Ingestion: Grade 2; oral LD50 = 1,410 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 IDH Value: Not listed

3.14 OSHA PEL-TWA: Not listed.

3.15 OSHA PEL-STEEL: Not listed.

3.16 OSHA PEL-Ceiling: Not listed.

3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: −20°F O.C.

4.2 Flammable Limits in Air: 1.5%−18.3%

4.3 Fire Extinguishing Agents: Dry chemical, alcohol foam, carbon dioxide

4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.

4.5 Special Hazards of Combustion Products: Currently not available

4.6 Behavior in Fire: Containers may explode in fire. Use water to cool container from safe distance.

4.7 Auto Ignition Temperature: 959°F

4.8 Electrical Hazards: Currently not available

4.9 Burning Rate: Currently not available

4.10 Caloric Flame Temperature: Currently not available

4.11 Stoichiometric Air to Fuel Ratio: 26.2 (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: Exothermic polymerization.

5.2 Reactivity with Common Materials: Incompatible with acids, bases, oxides, and water.

5.3 Stability During Transport: Stable

5.4 Neutralizing Agents for Acids and Caustics: Not pertinent

5.5 Polymerization: May occur when in contact with strong acids or bases

5.6 Inhibitor of Polymerization: Currently not available

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: 1 Damage to living resources: 2 Human Oral Hazard: 1 Reduction of amenities: X

7. SHIPPING INFORMATION

7.1 Grades of Purity: Technical, 99%

7.2 Storage Temperature: Ambient

7.3 Inert Atmosphere: No requirement

7.4 Venting: Pressure-vacuum

7.5 IMO Pollution Category: C

7.6 Ship Type: 3

7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 40 CFR Category: Flammable liquid

8.2 49 CFR Class: 3

8.3 49 CFR Package Group: II

8.4 Marine Pollutant: No

8.5 NFPA Hazard Classification: Category Classification

Health Hazard (Blue)........ 2
Flammability (Red)........... 3
Instability (Yellow).......... 2

8.6 EPA Reportable Quantity: 1000 pounds

8.7 EPA Pollution Category: C

8.8 ROR Waste Number: U013

8.9 EPA FIFRA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and atm: Liquid

9.2 Molecular Weight: 72

9.3 Boiling Point at 1 atm: 149°F = 63°C = 330 K

9.4 Freezing Point: <−58°F = −50°C = −223 K

9.5 Critical Temperature: Currently not available

9.6 Critical Pressure: Currently not available

9.7 Specific Gravity: 0.826 at 25°C (liquid)

9.8 Liquid Surface Tension: Currently not available

9.9 Liquid Water Interfacial Tension: Not pertinent

9.10 Vapor (Gas) Specific Gravity: 2.49

9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available

9.12 Latent Heat of Vaporization (est.): 180 Btu/lb = 100 cal/g = 4.2 X 107 J/kg

9.13 Heat of Combustion: −15,200 Btu/lb = −8,470 cal/g = −345 X 109 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 Values: Currently not available

9.19 Reid Vapor Pressure: 5.8 psi

NOTES

JUNE 1999
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