Tetrakis Hydroxymethyl Phosphonium Chloride MSDS

1. Product Name and Identification

- **Product Name:** Tetrakis(hydroxymethyl)phosphonium chloride
- **Synonyms:** THPC, Tetrakis(hydroxymethyl)phosphonium chloride solution
- **CAS Number:** 124-64-1
- **Chemical Formula:** $C_4H_{12}ClO_4P$
- **Recommended Use:** Flame retardant for textiles, biocide, chemical intermediate.
- **Company Identification:** [Enter Supplier Name and Contact Information Here]

2. Composition/Ingredients

- **Component Name:** Tetrakis(hydroxymethyl)phosphonium chloride
- **CAS Number:** 124-64-1
- **Concentration:** Often supplied as an 80% solution in water.

3. Hazards Identification

Emergency Overview: This product is a clear, colorless liquid with a sharp, pungent odor. It is corrosive and causes severe skin burns and serious eye damage. Harmful if swallowed and may cause an allergic skin reaction. It is toxic to aquatic life with long-lasting effects.

Potential Health Effects:

- **Eye Contact:** Corrosive. Causes serious and potentially permanent eye damage upon direct contact. Symptoms include severe pain, burns, and vision loss.
- **Skin Contact:** Corrosive. Causes severe skin burns and tissue damage. May be absorbed through the skin. Repeated or prolonged contact can lead to skin sensitization (allergic contact dermatitis).
- **Inhalation:** Harmful if mist or vapor is inhaled. Causes severe irritation and chemical burns to the nose, throat, and respiratory system. May lead to pulmonary edema.
- **Ingestion:** Harmful if swallowed. Causes severe chemical burns to the mouth, esophagus, and stomach. Symptoms include intense pain, vomiting, and potential perforation of the digestive tract.

4. First Aid Measures

- **Eye Contact:** Immediately and continuously flush eyes with large amounts of clean, low-pressure water for at least 30 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate, specialized medical attention.

- **Skin Contact:** Immediately remove all contaminated clothing. Rinse the affected skin area with plenty of water for at least 20 minutes. Seek immediate medical attention. Do not reuse clothing until it has been decontaminated.
- **Inhalation:** Move the exposed person to fresh air at once. If breathing has stopped, provide artificial respiration. If breathing is difficult, administer oxygen by trained personnel. Call for immediate medical assistance.
- **Ingestion:** Call a poison control center or doctor immediately for treatment advice. Do not induce vomiting. If the person is conscious and alert, rinse their mouth with water and give a small amount of water to drink. Never give anything by mouth to an unconscious or convulsing person.

5. Handling and Storage

- **Handling:** Do not get in eyes, on skin, or on clothing. Use only in a well-ventilated area, preferably within a closed system. Avoid breathing vapors or mists. Wear full personal protective equipment as specified in Section 8. Wash hands and any exposed skin thoroughly after handling.
- **Storage:** Store in a cool, dry, well-ventilated area away from direct sunlight and sources of heat. Keep container tightly sealed when not in use. Store in a corrosion-resistant container. Keep separate from incompatible materials such as strong bases, oxidizing agents, and metals.

6. Exposure Controls/Personal Protection

- **Engineering Controls:** Use of a closed-system and local exhaust ventilation is required to control airborne exposure. An emergency eyewash station and safety shower must be readily accessible in the immediate work area.
- **Personal Protective Equipment (PPE):**
    - **Eye/Face Protection:** Wear chemical splash goggles and a full-face shield.
    - **Skin Protection:** Wear chemical-resistant (impervious) gloves, such as butyl rubber or Viton. Wear a chemical-resistant apron, boots, and full-body suit to prevent any skin contact.
    - **Respiratory Protection:** When engineering controls are not sufficient, a NIOSH-approved supplied-air respirator or a cartridge respirator with organic vapor/acid gas cartridges is required.
    - **General Hygiene:** Discard contaminated clothing. Do not eat, drink, or smoke in areas where this material is handled.

7. Physical and Chemical Properties

- **Appearance:** Clear, colorless liquid
- **Odor:** Pungent, sharp
- **pH:** 3.0 - 5.0 (for 80% solution)
- **Melting Point:** Not applicable

- **Boiling Point:** Approximately 111 °C (232 °F)
- **Flash Point:** > 96 °C (205 °F)
- **Solubility in Water:** Miscible
- **Specific Gravity:** ~1.3
- **Molecular Weight:** 190.56 g/mol

8. Stability and Reactivity

- **Chemical Stability:** Stable under recommended storage conditions but can decompose over time, especially when heated.
- **Conditions to Avoid:** High temperatures, exposure to air (can slowly oxidize).
- **Incompatible Materials:** Incompatible with strong bases (can release flammable phosphine gas), strong oxidizing agents, and certain metals (e.g., carbon steel, aluminum, copper).
- **Hazardous Decomposition Products:** Thermal decomposition can produce toxic gases, including oxides of phosphorus, carbon monoxide, carbon dioxide, and hydrogen chloride.
- **Hazardous Polymerization:** Will not occur.

9. Toxicological Information

- **Acute Toxicity:**
    - **Oral (LD50, Rat):** 352 mg/kg.
    - **Dermal (LD50, Rabbit):** 200 - 2000 mg/kg.
- **Carcinogenicity:** Evidence suggests potential carcinogenic effects. It is listed by the State of California under Proposition 65 as a substance known to cause cancer. Not classified as a carcinogen by IARC or NTP.
- **Irritation:** Corrosive. Causes severe skin burns and serious eye damage.
- **Sensitization:** Known to be a skin sensitizer; may cause an allergic skin reaction.

10. Disposal Considerations

- **Waste Disposal:** This material and its container must be disposed of as hazardous waste. Disposal should be handled by a licensed professional waste disposal service in strict accordance with all applicable federal, state, and local environmental regulations. Do not allow this material to enter sewer systems or waterways. The user is responsible for determining the appropriate disposal method at the time of disposal.