Tris(1-Chloro-2-Propyl) Phosphate MSDS

1. Product Name and Identification

Product Name: Tris(1-Chloro-2-Propyl) Phosphate (TCPP)
Chemical Name: Tris(1-chloro-2-propyl) phosphate
Chemical Formula: $C_9H_{18}Cl_3O_4P$
CAS Number: 13674-84-5
EC Number: 237-158-7
Molecular Weight: 327.57 g/mol
Product Use: Flame retardant additive, plasticizer, industrial chemical intermediate
Supplier Information: [Company Name, Address, Telephone Number, Emergency Contact Details]

2. Composition/Ingredients

Component: Tris(1-Chloro-2-Propyl) Phosphate
Concentration: ≥ 99%
CAS Number: 13674-84-5
EINECS Number: 237-158-7
Impurities: May contain traces of dichloropropyl phosphates and phosphoric acid derivatives
Moisture Content: ≤ 0.2%

3. Hazards Identification

GHS Classification:

- Acute Toxicity - Oral (Category 4)
- Skin Irritation (Category 2)
- Eye Irritation (Category 2A)
- Aquatic Chronic Toxicity (Category 3)
- Specific Target Organ Toxicity - Repeated Exposure (Category 2)

Signal Word: WARNING

Hazard Statements:

- H302: Harmful if swallowed
- H315: Causes skin irritation
- H319: Causes serious eye irritation
- H373: May cause damage to organs through prolonged or repeated exposure

- H412: Harmful to aquatic life with long-lasting effects

Precautionary Statements:

- Do not breathe vapors or mist
- Wash hands thoroughly after handling
- Wear protective gloves and eye protection
- Avoid release to the environment
- If swallowed: Call a poison center if you feel unwell

4. First Aid Measures

Inhalation:

- Move person to fresh air and maintain comfortable breathing position
- If respiratory irritation develops, seek medical attention
- Provide artificial respiration if breathing has stopped
- Monitor for delayed respiratory effects

Skin Contact:

- Remove contaminated clothing immediately
- Wash affected area with soap and plenty of water for 15 minutes
- If irritation persists or develops, seek medical advice
- Launder contaminated clothing before reuse

Eye Contact:

- Flush eyes with clean water for at least 15 minutes
- Hold eyelids open to ensure thorough rinsing
- Remove contact lenses if easily removable after initial flushing
- Seek medical attention if irritation continues

Ingestion:

- Rinse mouth with water but do not induce vomiting
- Give small sips of water if person is conscious and alert
- Seek immediate medical attention
- Provide medical personnel with this safety data sheet

5. Handling and Storage

Handling Precautions:

- Use in well-ventilated areas or with adequate local exhaust

- Avoid skin and eye contact
- Prevent inhalation of vapors or mist
- Use appropriate personal protective equipment
- Ground containers during transfer operations
- Avoid generating static electricity

Storage Requirements:

- Store in original container in cool, dry, well-ventilated area
- Keep container tightly sealed when not in use
- Store between 15-30°C to maintain product stability
- Keep away from heat sources, ignition sources, and direct sunlight
- Segregate from strong oxidizing agents and strong acids
- Provide secondary containment for bulk storage

6. Exposure Controls/Personal Protection

Exposure Limits:

- No established OSHA PEL or ACGIH TLV
- Recommended occupational exposure limit: 2 mg/m^3 (8-hour TWA)
- DNEL (Workers, long-term inhalation): 1.77 mg/m^3

Engineering Controls:

- Local exhaust ventilation at point of use
- General mechanical ventilation for enclosed areas
- Eyewash stations and emergency showers within immediate work area
- Vapor recovery systems for large-scale operations

Personal Protective Equipment:

- **Respiratory:** Half-face respirator with organic vapor cartridges for vapor exposure
- **Eye Protection:** Chemical safety goggles or face shield
- **Skin Protection:** Chemical-resistant gloves (nitrile recommended), protective clothing
- **Body Protection:** Chemical-resistant apron for handling operations
- **Footwear:** Closed-toe shoes with chemical-resistant soles

7. Physical and Chemical Properties

Appearance: Colorless to pale yellow viscous liquid
Odor: Mild, characteristic odor

Odor Threshold: Not established
pH: Not applicable (neat material)
Melting Point: Not applicable
Boiling Point: 236-240°C at 760 mmHg
Flash Point: 193°C (closed cup)
Density: 1.29-1.31 g/cm^3 at 20°C
Viscosity: 58-75 cP at 25°C
Vapor Pressure: <0.01 mmHg at 25°C
Solubility: Limited solubility in water (1.6 g/L at 24°C), miscible with most organic solvents

8. Stability and Reactivity

Chemical Stability: Stable under recommended storage and handling conditions

Conditions to Avoid:

- Elevated temperatures above 200°C
- Direct flame or spark sources
- Strong acidic or basic conditions
- UV radiation for extended periods

Incompatible Materials:

- Strong oxidizing agents
- Strong acids and bases
- Aluminum and aluminum alloys
- Iron and steel at elevated temperatures

Hazardous Decomposition Products:

- Hydrogen chloride
- Carbon monoxide and carbon dioxide
- Phosphorus compounds
- Chlorinated organic compounds

Hazardous Reactions: No hazardous polymerization known to occur

9. Toxicological Information

Acute Toxicity:

- Oral LD50 (rat): 1,230 mg/kg
- Dermal LD50 (rabbit): >2,000 mg/kg
- Inhalation LC50: No data available, expected low acute inhalation toxicity

Health Effects:

- **Acute:** Mild gastrointestinal irritation, skin and eye irritation

- **Chronic:** Potential liver effects with repeated exposure
- **Sensitization:** No evidence of skin or respiratory sensitization

Target Organs:

- Primary: Liver, kidneys
- Secondary: Nervous system (with high-dose chronic exposure)

Carcinogenicity:

- Not classified by IARC, NTP, or OSHA
- Limited animal studies show no carcinogenic effects

Reproductive Toxicity:

- Animal studies suggest potential developmental effects at high doses
- No evidence of fertility impairment

10. Disposal Considerations

Waste Disposal Methods:

- Dispose through licensed hazardous waste contractor
- Incineration at approved high-temperature facility with scrubbing equipment
- Do not dispose in regular trash or pour down drains
- Comply with federal, state, and local disposal regulations

Container Disposal:

- Triple rinse containers and offer for recycling where possible
- Puncture containers to prevent reuse for inappropriate applications
- Dispose of rinsate according to local regulations
- Empty containers may retain product residues

Environmental Precautions:

- Prevent release to waterways, sewers, or soil
- Product is not readily biodegradable
- May bioaccumulate in aquatic organisms
- Use appropriate spill containment measures during disposal operations

Regulatory Information:

- Waste code varies by jurisdiction
- May be subject to RCRA regulations if discarded
- Check local and state requirements for specific disposal methods

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Emergency Contact: [24-hour emergency response number]
Regulatory Compliance: This document complies with OSHA HCS 2012, GHS Rev. 7, and applicable international standards

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