

SAFETY DATA SHEET



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TRIBUTYL PHOSPHATE

SDS No. M0194

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Tributyl Phosphate

Synonyms: Phosphoric Acid Tributyl Ester; Tri-n-butyl Phosphate

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification

Acute Toxicity, Oral: GHS Category 4

Acute Toxicity, Inhalation: GHS Category 4

Skin Irritation: GHS Category 2

Acute Aquatic Toxicity: GHS Category 2

Label Elements

Signal Word: WARNING!

Hazard Statements:

H302 – Harmful if swallowed.

H315 – Causes skin irritation

H332 – Harmful if inhaled.

H351 – Suspected of causing cancer.

H402 – Harmful to aquatic life.

Precautionary Statements:

P273 – Avoid release to the environment.

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Emergency Overview

Causes irritation of eyes and skin. Inhalation of mist may irritate lungs. May be harmful if swallowed. Weak Cholinesterase inhibitor. Symptoms of cholinesterase inhibition may include may include salivation, sweating, headache, nausea. Muscle

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twitching, tremors, incoordination, blurred vision, abdominal cramps, diarrhea and chest discomfort. Target Organs: Respiratory system, nervous system, eyes, and skin.

HMIS Rating:

Health – 2 Flammability – 1 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Tributyl Phosphate	126-73-8	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Ingestion: Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person. Get medical aid.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Combustible liquid and vapor. (GHS Category 4)

Auto-ignition Temperature: 482° C (899° F)

Flash Point: 146-165° C

Flammable Limits: No information found.

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (Carbon monoxide, oxides of phosphorus, carbon dioxide, n-butanol, phosphoric acid).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

Specific Explosion Hazards: No information available.

Fire Fighting Media: Use dry chemical, carbon dioxide, water spray, or appropriate foam.

National Fire Protective Association: Health - 3, Flammability - 1, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Store away from ignition sources. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Temperatures from 80-100°F(27-37.8°C) provide good rates of flow.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use adequate ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or other appropriate eye protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 0.2 ppm TWA

NIOSH – 0.2 ppm TWA; 2.5 mg/m³ TWA 30 ppm IDLH

OSHA Final PELs – 5 mg/m³ TWA

OSHA Vacated PELs: 0.2 ppm TWA; 2.5 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear to pale yellow liquid.

Odor: Odorless

Molecular Formula: [CH₃(CH₂)₃O]₃PO

Molecular Weight: 266.32

Auto-ignition Temperature: 482° C (899° F)

Flash Point: 146-165° C

Flammable Limits: No information found.

pH: Not available.

Boiling Point: 289° C

Freezing/Melting Point: -24° C

Decomposition Temperature: Not available.

Specific Gravity: 0.9790 g/cm³

Vapor Density (Air=1): 9.12

Vapor Pressure: 0.00012 mm Hg @ 25 deg C.

Evaporation Rate (Butyl acetate = 1): Negligible.

Viscosity: 3.39 cps @ 25 deg C.

Solubility: Slightly soluble

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressures. Decomposes when heated forming phosphoric acid and butene, or on contact with warm water forming phosphoric acid and butanol.

Conditions to Avoid: Excess heat, exposure to moist air or water.

Incompatibility With Various Substances: Strong oxidizing agents, strong bases.

Hazardous Decomposition Products: Carbon monoxide, oxides of phosphorus, carbon dioxide, n-butanol, phosphoric acid.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of a mist may cause respiratory tract irritation. Material has a very low vapor pressure at room temperature, so inhalation exposures are not expected unless material is heated or misted. Workers exposed at 15 mg/m³ of TBP have complained of nausea and headache.

INGESTION HAZARD: May be harmful if swallowed.

SKIN CONTACT HAZARD: Causes skin irritation. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts.

EYE CONTACT HAZARD: Causes eye irritation.

Chronic Exposure Hazards: Prolonged or repeated skin contact may cause dermatitis. Repeated oral administration of TBP has caused pathological changes in the rat bladder.

Animal Toxicity:

Draize test, rabbit, eye: 500 mg Severe;

Inhalation, mouse: LC50 = 1300 mg/m³;

Inhalation, rat: LC50 = 28 gm/m³/1H;

Oral, mouse: LD50 = 1189 mg/kg;

Oral, rat: LD50 = 3 gm/kg;

Skin, rabbit: LD50 = >3100 mg/kg;

Carcinogenicity: limited evidence available for carcinogenicity in animal studies.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish: Rainbow trout: LC50 = 5.0-9.0 mg/L; 96 Hr.; Unspecified

Fish: Carp: LC50 = 5.0-9.0 mg/L; 96 Hr.; Unspecified No data available.

Environmental Fate: Terrestrial: If applied to soil, tributyl phosphate would be expected to adsorb to soil and biodegrade. Tributyl phosphate applied to land as sludge, tilled and irrigated with wastewater was completely degraded. Aquatic: If released in water, tributyl phosphate will adsorb to sediment and particulate matter in the water column and biodegrade. In a study of contamination of the lower Weser River, Germany it was found that in the high water periods in the cold months (flow rate >400 cu m/s, avg temp 6.9 deg C).

Physical: Atmospheric: In the atmosphere, tributyl phosphate should exist primarily as a vapor, based upon the vapor pressure of 1.2×10^{-4} mm Hg at 25 deg C and degrade due to reaction with photochemically-produced hydroxyl radicals. Its estimated half-life with hydroxyl radical is 4.9 hr. Tributyl phosphate partitions into fog water in the atmosphere to an extent which is ten times greater than that predicted from the Henry's Law constant. The aqueous-phase enrichment is 1.6 million as determined from the concentrations in fog water and interstitial air.

Other: According to a suggested classification scheme, this estimated Koc suggests that tributyl phosphate would have low mobility in soil. The partition coefficient between marine sediment and water is 3.5.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

Not regulated for transportation.

15. REGULATORY INFORMATION

US Federal Regulations:

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 126-73-8 – immediate, delayed

Section 313: Tributyl phosphate (126-73-8) is not subject to SARA Title III Section 313 reporting requirements.

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 126-73-8 is on the following state right-to-know lists: Pennsylvania, New Jersey, and Massachusetts

California Prop 65: This product contains no chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Originally Prepared: 6/30/2006

Last Revised: 11/24/2014 – Updated hazard categories, hazard statements, and precautionary statements in Section 2.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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