1. Product Identification

   **Synonyms:** Phosphoric acid tributyl ester; Tri-n-butyl phosphate
   **CAS No.:** 126-73-8
   **Molecular Weight:** 266.32
   **Chemical Formula:** (CH₃CH₂CH₂CH₂O)₃PO
   **Product Codes:**
   - J.T. Baker: W432
   - Mallinckrodt: 1940

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
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<tbody>
<tr>
<td>Tributyl Phosphate</td>
<td>126-73-8</td>
<td>99 - 100%</td>
<td>Yes</td>
</tr>
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</table>

3. Hazards Identification

   **Emergency Overview**

   **WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY AFFECT CENTRAL NERVOUS SYSTEM.**

   **SAF-T-DATA(R) Ratings (Provided here for your convenience)**

   - **Health Rating:** 3 - Severe
   - **Flammability Rating:** 1 - Slight
   - **Reactivity Rating:** 1 - Slight
   - **Contact Rating:** 2 - Moderate (Life)
   - **Lab Protective Equip:** GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
   - **Storage Color Code:** Green (General Storage)

   **Potential Health Effects**

   **Inhalation:**
   Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. May cause headache. May also mildly affect blood cholinesterase levels, which will affect central nervous system operation.

   **Ingestion:**
   May cause abdominal pain, vomiting. Other symptoms parallel inhalation.

   **Skin Contact:**
   Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.

   **Eye Contact:**
   Causes irritation, redness, and pain.

   **Chronic Exposure:**
   No information found.

   **Aggravation of Pre-existing Conditions:**
   Persons with pre-existing central nervous system disorders may be more susceptible to the effects of this substance.

4. First Aid Measures

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

   **Ingestion:**
   Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

   **Skin Contact:**
   Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

   **Eye Contact:**

http://www.jtbaker.com/msds/engishtml/t4706.htm
5. Fire Fighting Measures

Fire:
- Flash point: 120°C (248°F) OC
- Slight fire hazard when exposed to heat or flame.

Explosion:
- Above the flash point, explosive vapor-air mixtures may be formed.

Fire Extinguishing Media:
- Water spray, dry chemical, alcohol foam, or carbon dioxide. Water or foam may cause frothing.

Special Information:
- In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
  - 5 mg/m³ (TWA)

- ACGIH Threshold Limit Value (TLV):
  - 2.2 mg/m³ (0.2 ppm) (TWA)

Ventilation System:
- A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
- If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
- Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
- Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
- Colorless to yellowish liquid.

Odor:
- Odorless.

Solubility:
- Slightly soluble in water.

Specific Gravity:
- 0.98 @ 25°C/25°C

pH:
- No information found.

% Volatiles by volume @ 21°C (70°F):
- No information found.

Boiling Point:
- 289°C (552°F)

Melting Point:
- -80°C (-112°F)

Vapor Density (Air=1):
- 9.2

Vapor Pressure (mm Hg):
- 0.8 @ 114°C (237°F)

Evaporation Rate (BuAc=1):
- No information found.

10. Stability and Reactivity
Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Burning may produce carbon monoxide, carbon dioxide, phosphorous oxides.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Strong oxidizers, strong bases. May soften some plastics and elastomers. Avoid wet alkaline conditions, especially when the material is heated, because tributyl phosphate undergoes hydrolysis to produce butyl alcohol and alkyl phosphoric acid salts.

Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 3 gm/kg; Inhalation rat LD50: 28 gm/m3/1-hour; Skin rabbit LD50: > 3100 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

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<tr>
<th>Ingredient</th>
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<td>No</td>
<td>None</td>
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</table>

12. Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is not expected to leach into groundwater. When released into water, this material may biodegrade to a moderate extent. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.

Environmental Toxicity:
96 Hr LC50 Oncorhynchus mykiss: 5.0 mg/L;
96 Hr LC50 Pimephales promelas: 8.18 mg/L [flow-through];
96 Hr LC50 Brachydanio rerio: 11.8 mg/L [static];
96 Hr LC50 Oryzias latipes: 4.5 mg/L

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

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Chemical Weapons Convention: No
TSCA 12(b): No
COTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No
(Pure / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.
16. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 1

Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY AFFECT CENTRAL NERVOUS SYSTEM.

Label Precautions:
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
No Changes.

Disclaimer:
************************************************************************************************
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)