PRODUCT NAME: Isopropylated Triphenyl Phosphate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Triaryl Phosphate
Synonyms: Triaryl phosphates, Isopropylated; Triaryl phosphate; Konitex 100
Product Use: See Additional Information
Chemical Name: Mixture
Chemical Family: Phosphate Esters

Additional Information
Product Use: Flame retardant additive for PVC, flexible polyurethanes, cellulosic resins and synthetic rubber compositions. Flame retardant processing in engineering resins.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>CAS NO.</th>
<th>%</th>
<th>EXPOSURE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropylated triphenyl phosphate</td>
<td>68937417</td>
<td>60 - 100</td>
<td>Not established (OSHA PEL TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL CEIL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV CEIL)</td>
</tr>
<tr>
<td>Triphenyl phosphate</td>
<td>115866</td>
<td>10 - 30</td>
<td>N (Hazardous)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 mg/m3 (OSHA PEL TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL CEIL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 mg/m3, A4 (ACGIH TLV TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV CEIL)</td>
</tr>
</tbody>
</table>

*Indented chemicals are components of previous ingredient.

Additional Information
Additional exposure limit for triphenyl phosphate:
NIOSH REL TLV = 3 mg/m3

3. HAZARDS IDENTIFICATION

Emergency Overview: Clear, colorless liquid
No odor
Mists generated by heat, violent agitation or spraying will irritate skin, eyes, nose, throat and respiratory system.

Relevant Routes of Exposure: Ingestion, inhalation and skin absorption
Signs and Symptoms of Overexposure: General reddening and irritation to the skin and eyes, mucous membrane irritation, upper respiratory tract irritation.

Medical Conditions Generally Aggravated By Exposure: None reported

Potential Health Effects: See Section 6 for additional information.

Eyes: May cause eye irritation.

Skin: May cause skin irritation. Prolonged or continuous contact with skin will cause irritation.

Ingestion: May cause nervous system effects.

Inhalation: May cause respiratory tract irritation, mucous membrane irritation and nervous system effects.

Chronic Health Effects: Prolonged or repeated exposure may cause liver, adrenal, thymus, reproductive, developmental and neurological effects based on animal data.

Carcinogenicity: NTP: No ACGIH: No
IARC: No OTHER: No

OSHA: No

Additional Information
No information available

4. FIRST AID MEASURES

Eyes: Flush with large volumes of water for at least 15 minutes. Get medical attention.

Skin: Wash with large volumes of soap and water for at least 15 minutes. If irritation develops, get medical attention.

Ingestion: If conscious, give person 1 to 2 glasses of water. Get medical attention immediately.

Inhalation: Remove person to fresh air. Get medical attention.

Antidotes: No information available

Notes to Physicians and/or Protection for First-Aiders: Product has low acute oral and dermal toxicity and is may be irritating to the eyes and skin. Treatment is controlled removal or exposure followed by symptomatic and supportive care. Human systemic toxicity information is unavailable, but expected to be low. Neurological evaluation of workers, where no differences were demonstrated between triaryl phosphate esters exposed and control populations, support this conclusion. [1]

Additional Information

5. FIRE FIGHTING MEASURES

Flammable Limits in Air (% by Volume): Not available
Flash Point: 200 degrees C (392 degrees F) (PMCC)
Autoignition Temperature: Not available
Extinguishing Media: All conventional media are suitable.
Fire Fighting Instructions: Wear a self-contained breathing apparatus and protective clothing to prevent skin and eye contact in fire situations.
Unusual Fire and Explosion Hazards: Under fire conditions, toxic and irritating fumes may be emitted.

Flammability Classification: Slightly combustible
Known or Anticipated Hazardous Products of Combustion: Oxides of phosphorus
Carbon monoxide and carbon dioxide

Additional Information
No information available

6. ACCIDENTAL RELEASE MEASURES
Accidental Release Measures: Contain spill.
Wearing appropriate personal protective equipment, collect spill with the aid of an inert absorbent and place in suitable labeled containers for disposal.

Personal Precautions: See Section 8.
Environmental Precautions: Avoid releasing to the environment.

Additional Information
No information available

7. HANDLING AND STORAGE
Handling: Use appropriate personal protection equipment.
Avoid eye, skin and clothing contact.
Do not breathe mist or vapor.
Avoid repeated and prolonged contact.
Use only in a well ventilated area.
Store and handle away from any product involved in food processing.
Avoid the generation of aerosols from spraying, pouring or vigorous agitation whenever possible, particularly if product is heated. If the generation of airborne materials cannot be avoided, exhaust ventilation and/or personal protective equipment as described in section 8 should be used.

Storage: Store in a cool, dry, well-ventilated area away from incompatible materials.
Keep container tightly closed.
Protect containers against damage.

Other Precautions: No information available

Additional Information
No information available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Engineering Controls: Control with appropriate exhaust ventilation if misting is expected in occupied areas.

Ventilation Requirements: Use local ventilation to keep levels below established threshold values.
Use mechanical ventilation for general area control.

Personal Protective Equipment: Chemical safety goggles or full face shield
Eye/Face Protection: Recommend butyl (heavy duty) or polyethylene (light duty) gloves.
Skin Protection: Wear an apron or impervious clothing and rubber boots if splashing is expected.
Respiratory Protection: Wear a NIOSH/MSHA approved organic cartridge respirator in high temperature applications, if misting or vapor occurs, or there is potential for airborne exposures to exceed established threshold values. Consult the OSHA
respiratory protection information located at 29CFR 1910.134 and the
American National Standard Institute's Practices of Respiratory Protection
Z88.2.
Wear a NIOSH/MSHA approved self-contained breathing apparatus in
emergency situations.

Other Protective Clothing or
Equipment:
Wear a NIOSH/MSHA approved self-contained breathing apparatus in
emergency situations.

Exposure Guidelines:
Wear an apron or impervious clothing and rubber boots if splashing is expected.

Work Hygienic Practices:
See Section 2.
Wash thoroughly after handling.
Wash contaminated clothing before reuse.

Additional Information
No information available

9. PHYSICAL & CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear colorless liquid</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>220 - 265 degrees C (428 - 509 degrees F) at 4 mmHg</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>&lt;-40 degrees C</td>
</tr>
<tr>
<td>Heat Value</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Molecular/Chemical Formula</td>
<td>Mixture</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>N/A</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>Not available</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Particle Size</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Additional Information
No information available

10. STABILITY AND REACTIVITY

Stability:
Stable under normal conditions of handling and use.

Conditions to Avoid:
None

Incompatibility With Other Materials:
None known

Hazardous Decomposition Products:
Thermal decomposition may produce the following:
Oxides of phosphorus
Carbon monoxide and carbon dioxide

Hazardous Polymerization:
Will not occur

Conditions to Avoid:
None

Additional Information
No information available
11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>VALUE (LD50 OR LC50)</th>
<th>ANIMAL</th>
<th>ROUTES</th>
<th>COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;200 mg/L</td>
<td>Rat</td>
<td>Acute Inhalation</td>
<td>Similar Product</td>
</tr>
<tr>
<td>&gt;2,000 mg/kg</td>
<td>Rat</td>
<td>Acute Dermal</td>
<td>Similar Product</td>
</tr>
<tr>
<td>&gt;5,000 mg/kg</td>
<td>Rat</td>
<td>Acute Oral</td>
<td>Similar Product</td>
</tr>
</tbody>
</table>

**Toxicological Information:**
Based on a similar material, this material has low acute oral and dermal toxicity. Primary eye and skin irritation studies in rabbits on a similar material did not result in eye or skin irritation. However, eye and skin irritation may be possible. Prolonged or continuous contact with skin will cause irritation. This material may be irritating to the respiratory system and mucous membranes. Breathing or swallowing large quantities may cause neurological effects. Repeated exposure over a prolonged period of time may cause neurological effects.

A combined repeated dose toxicity study with a reproductive and developmental screen (OECD 422) was performed on rats with this material via oral administration of either 0, 25, 100, or 400 mg/kg/day. The number of successful pregnancies and viable offspring were substantially reduced at the mid and high doses. In addition, the following organs were adversely affected: thymus and male reproductive organs in the high-dose group, liver and/or adrenal effects in at least one sex of the high- and mid-dose groups and female reproductive organs and adrenals of females at all doses. A NOAEL could not be determined for this study.

In an in vitro mammalian chromosome aberration test using human peripheral blood lymphocytes with and without Aroclor included S9 activation, this material was concluded to be negative for the induction of structural and numerical chromosome aberrations.

Other acute and chronic health hazards, as well as target organs, are unknown.

**Additional Information**
Note: Epidemiology studies completed in 1977 and 1985 of current and former workers at the production facility where natural and synthetic triaryl phosphates are manufactured have not demonstrated any unusual pattern of mortality or disease.

12. ECOLOGICAL INFORMATION

**Ecological Information:** The following ecological information is offered:

**Similar product:**
- LC50 in rainbow trout (96H) = 1.6 (1.2 - 2.2) mg/L
- LC50 in fathead minnow (96H) = 10.8 (8.0 - 14.6) mg/L
- EC50 in Daphnia magna (48H) = 2.44 (1.93 - 3.08) mg/L

Avoid releasing to the environment.

**Additional Information**
No information available

13. DISPOSAL CONSIDERATIONS

**Disposal Considerations:** Dispose of waste at an approved chemical disposal facility in compliance with all current Local, State/Province, Federal/Canadian laws and regulations.

If the product was supplied in a single use container, care should be taken to dispose of the container in a responsible manner and in accordance with applicable regulations.

**Additional Information**
No information available

14. TRANSPORT INFORMATION

This substance is not subject to IMO IMDG Code.
15. REGULATORY INFORMATION

International Regulations:
Canada - DSL
EU - EINECS
Australia - AICS
Korea - ECL
Japan - ENCS
Philippines - PICCS

The above regulatory information represents only selected regulations and is not meant to be a complete list.

16. OTHER INFORMATION

Label Hazard Warning:
WARNING! CAUSES LIGHT EYE IRRITATION.

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