1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name: Bis(tributyltin) oxide
Product Code: SC-252470

Recommended use of the chemical and restrictions on use
For research use only. Not intended for diagnostic or therapeutic use.

2. HAZARDS IDENTIFICATION

Classification
- Acute toxicity - Oral: Category 3
- Acute toxicity - Dermal: Category 4
- Acute toxicity - Inhalation (Dusts/Mists): Category 2
- Skin corrosion/irritation: Category 2
- Serious eye damage/eye irritation: Category 2
- Reproductive toxicity: Category 1B
- Specific target organ toxicity (repeated exposure): Category 1

Label elements
- Signal word: Danger
- Hazard statements:
  - Toxic if swallowed
  - Harmful in contact with skin
  - Fatal if inhaled
  - Causes skin irritation
  - Causes serious eye irritation
  - May damage fertility or the unborn child
  - Causes damage to organs through prolonged or repeated exposure

Symbols/Pictograms

Precautionary Statements - Prevention
- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Do not breathe dust/fume/gas/mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Wear respiratory protection
Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of soap and water Call a POISON CENTER or doctor/physician if you feel unwell
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth

Precautionary Statements - Storage
Store locked up Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Hazards not otherwise classified (HNOC)
Not applicable

Other Information
Other hazards
Very toxic to aquatic life with long lasting effects. Very toxic to aquatic life.

NFPA
Health hazards 2
Flammability 1
Stability 0
Physical and chemical properties -

HMIS
Health hazards 2
Flammability 1
Physical hazards 0
Personal protection -
* = Chronic Health Hazard

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>56-35-9</td>
<td>&gt;98</td>
<td>= 87 mg/kg (Rat)</td>
<td>= 9000 mg/kg (Rabbit)</td>
<td>= 77 mg/m³ (Rat) 4 h</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First Aid Measures

General advice
Immediate medical attention is required. If symptoms persist, call a physician.

Eye contact
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately. If symptoms persist, call a physician.

Skin Contact
Immediate medical attention is required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. Wash off immediately with plenty of water. If skin irritation persists, call a physician.

Inhalation
Immediate medical attention is required. Remove to fresh air. If not breathing, give artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Move to fresh air in case of accidental inhalation of vapors. If symptoms persist, call a physician.

Santa Cruz Biotechnology, Inc.  www.scbt.com
Ingestion

Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Drink plenty of water. Clean mouth with water and drink afterwards plenty of water. Call a physician.

Self-protection of the first aider

Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms

No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media

No information available.

Specific hazards arising from the chemical

Specific hazards arising from the chemical

No information available.

Hazardous combustion products

Carbon oxides.

Explosion data

Sensitivity to Mechanical Impact

No information available.

Sensitivity to Static Discharge

No information available.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions

Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

Environmental precautions

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Cover liquid spill with sand, earth or other non-combustible absorbent material. Dam up. Use personal protective equipment as required. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Use with local exhaust ventilation.

Conditions for safe storage, including any incompatibilities
Storage Conditions
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers. Store at 4 °C.
Incompatible materials
None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure Guidelines
Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>STEL: 0.2 mg/m$^3$ Sn</td>
<td>TWA: 0.1 mg/m$^3$ Sn</td>
<td>TWA: 0.1 mg/m$^3$ Sn except Cyhexatin Sn</td>
</tr>
<tr>
<td></td>
<td>TWA: 0.1 mg/m$^3$ Sn</td>
<td>(vacated) TWA: 0.1 mg/m$^3$ Sn</td>
<td>(vacated) S*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IDLH: 25 mg/m$^3$ Sn</td>
<td></td>
</tr>
</tbody>
</table>

NIOSH IDLH Immediately Dangerous to Life or Health

Appropriate engineering controls
Engineering Controls
Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment
Eye/face protection
Tight sealing safety goggles. Face protection shield.
Skin and Body Protection
Wear protective gloves and protective clothing.
Respiratory protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations
When using do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Wash hands thoroughly after handling. Keep away from food, drink and animal feeding stuffs.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>7.5 at 20 °C</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>180 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>190 °C CC (closed cup)</td>
</tr>
<tr>
<td>Liquid Density</td>
<td>1.17 g/mL</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>0.0001 mmHg</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity: Not applicable

Chemical stability: Stable under recommended storage conditions.
Possibility of Hazardous Reactions: None under normal processing.
Hazardous polymerization: No information available.
Conditions to avoid: Extremes of temperature and direct sunlight.
Incompatible materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
- Inhalation: No data available.
- Eye contact: No data available.
- Skin Contact: No data available.
- Ingestion: No data available.

Information on toxicological effects
- Symptoms: No information available.
- Delayed and immediate effects as well as chronic effects from short and long-term exposure:
  - Chronic Toxicity: Avoid repeated exposure. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.
  - Target Organ Effects: Blood, Central nervous system, Eyes, Respiratory system, Kidney, Liver, Skin, Urinary Tract.

Numerical measures of toxicity - Product Information
- Unknown acute toxicity: No information available.
The following values are calculated based on chapter 3.1 of the GHS document
- ATEmix (oral): 87 mg/kg
- ATEmix (dermal): 1100 mg/kg
- ATEmix (inhalation-dust/mist): 0 mg/l
- ATEmix (inhalation-vapor): 77 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicity: Very toxic to aquatic life with long lasting effects

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>0.00033: 72 h Skeletonema costatum mg/L EC50</td>
<td>1000: 96 h Poecilia reticulata µg/L LC50 static 7.5: 96 h</td>
<td>-</td>
<td>0.00075: 48 h Daphnia magna mg/L EC50 Static</td>
</tr>
</tbody>
</table>
Poecilia reticulata µg/L LC50 2.4: 96 h Oryzias latipes µg/L LC50 5.6 - 10: 96 h Lepomis macrochirus µg/L LC50 static 1.02 - 1.52: 96 h Oncorhynchus mykiss µg/L LC50 flow-through 0.0046 - 0.0069: 96 h Oncorhynchus mykiss mg/L LC50 static 0.0024 - 0.003: 96 h Pimephales promelas mg/L LC50 flow-through 0.0036 - 0.0052: 48 h

0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Persistence and degradability  No information available.
Bioaccumulation  No information available.
Mobility  No information available.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Partition coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>3.2</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Disposal of wastes  Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated packaging  Do not reuse container.
Other Information  Waste codes should be assigned by the user based on the application for which the product was used.
California Hazardous Waste Status  This product contains one or more substances that are listed with the State of California as a hazardous waste.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>California Hazardous Waste Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>Toxic</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
UN/ID no  UN2788
Hazard Class  6.1
Packing Group  II
Proper shipping name  Organotin compounds, liquid, n.o.s.
Description  UN2788, Organotin compounds, liquid, n.o.s., 6.1, II
Marine pollutant  This product contains a chemical which is listed as a severe marine pollutant according to DOT
Emergency Response Guide Number  153

IMDG
UN/ID no  UN2788
Hazard Class  6.1
Packing Group  II
Proper shipping name  Organotin compound, liquid, n.o.s.
Description  UN2788, Organotin compound, liquid, n.o.s. (Bis(tributyltin) oxide), 6.1, II, Marine pollutant
Special Provisions  43, 274
EmS-No  F-A, S-A
Marine pollutant  This product contains a chemical which is listed as a marine pollutant according to IMDG/IMO
IATA
UN/ID no  UN2788
Hazard Class  6.1
Packing Group  II
Proper shipping name  Organotin compound, liquid, n.o.s.
Description  UN2788, Organotin compound, liquid, n.o.s. (Bis(tributyltin) oxide), 6.1, II
ERG Code  6L

15. REGULATORY INFORMATION

International Inventories
All of the components in the product are on the following Inventory lists
TSCA (United States): Canada (DSL/NDSL) Europe (EINECS/ELINCS/NLP) Australia (AICS) South Korea (KECL): China (IECSC)
ENCS (Japan): Philippines (PICCS)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>KECL</th>
<th>PICCS</th>
<th>AICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

X - Listed
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
Acute health hazard  Yes
Chronic Health Hazard  Yes
Fire hazard  No
Sudden release of pressure hazard  No
Reactive hazard  No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis(tributyltin) oxide</td>
<td>X</td>
<td>X</td>
<td>Not Listed</td>
</tr>
<tr>
<td>56-35-9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION
Revision note

No information available

Disclaimer
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet