1. Identification

Product identifier: Liothyronine

Other means of identification:

- Catalog number: 1368008
- CAS number: 6893-02-3
- Synonyms: Triiodothyronine * T3
- Chemical name: L-Tyrosine,O-(4-hydroxy-3-iodophenyl)-3,5-diiodo-

Recommended use: Specified quality tests and assay use only.

Recommended restrictions: Not for use as a drug. Not for administration to humans or animals.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

- Company name: U. S. Pharmacopeia
- Address: 12601 Twinbrook Parkway
  Rockville
  MD
  20852-1790
  United States
- Telephone: RS Technical Services 301-816-8129
- Website: www.usp.org
- E-mail: RSTECH@usp.org
- Emergency phone number:
  CHEMTREC within US &
  Canada 1-800-424-9300
  CHEMTREC outside US &
  Canada +1 703-527-3887

2. Hazard(s) identification

Physical hazards: Not classified.

Health hazards:

- Acute toxicity, oral Category 3
- Specific target organ toxicity, repeated exposure Category 1 (cardiovascular system, thyroid gland)

Environmental hazards: Not classified.

OSHA defined hazards: Not classified.

Label elements

Signal word: Danger

Hazard statement: Toxic if swallowed. Causes damage to organs (cardiovascular system, thyroid gland) through prolonged or repeated exposure.

Precautionary statement

Prevention: Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling.

Response: If swallowed: Immediately call a poison center/doctor. Rinse mouth. Get medical advice/attention if you feel unwell.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC): None known.

Supplemental information: Potent pharmacologically active material.

3. Composition/information on ingredients

Substance
**Chemical name** | **Common name and synonyms** | **CAS number** | **%**
---|---|---|---
Liothyronine | Triiodothyronine T3 | 6893-02-3 | 100

### 4. First-aid measures

**Inhalation**
Move to fresh air. Call a physician if symptoms develop or persist.

**Skin contact**
Rinse skin with water/shower. Get medical attention if irritation develops and persists.

**Eye contact**
Get medical attention if irritation develops and persists.

**Ingestion**
Call a physician or poison control center immediately. Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if substance is ingested.

**Most important symptoms/effects, acute and delayed**
Hyperthyroidism Potent pharmacologically active material. Occupational exposure to small amounts may cause physiological effects.

**Indication of immediate medical attention and special treatment needed**
Provide general supportive measures and treat symptomatically. Administer activated charcoal as a slurry. Use beta-adrenergic antagonists such as propranolol, labetalol, or sotalol for treatment of adrenergic findings associated with hyperthyroidism. Bisoprolol has been used to treat cardiac symptoms of adrenergic overactivity. For seizures, administer a benzodiazepine intravenously, followed by phenobarbital or propofol if the seizures recur. Monitor for hypotension, dysrhythmias, respiratory depression, and need for endotracheal intubation. Evaluate for hypoglycemia, electrolyte disturbances, hypoxia. Large doses of anti-thyroid drugs (methimazole or propylthiouracil) followed by iodine may inhibit synthesis and release of thyroid hormones. Glucocorticoids may be used to inhibit the conversion of T4 to T3. This material is not dialyzable.

**General information**
Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.

### 5. Fire-fighting measures

**Suitable extinguishing media**
Water. Foam. Dry chemical or CO2. Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media**
None known.

**Specific hazards arising from the chemical**
No unusual fire or explosion hazards noted.

**Special protective equipment and precautions for firefighters**
Wear suitable protective equipment.

**Fire fighting equipment/instructions**
Use water spray to cool unopened containers. As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing equipment and protective clothing.

**Specific methods**
Use standard firefighting procedures and consider the hazards of other involved materials.

**General fire hazards**
No unusual fire or explosion hazards noted.

### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Keep unnecessary personnel away. Wear appropriate personal protective equipment. Avoid inhalation of dust from the spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. For personal protection, see section 8 of the SDS.

**Methods and materials for containment and cleaning up**
For waste disposal, see section 13 of the SDS. Avoid the generation of dusts during clean-up. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination.

**Environmental precautions**
Avoid discharge into drains, water courses or onto the ground.

### 7. Handling and storage

**Precautions for safe handling**
As a general rule, when handling USP Reference Standards, avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly. Select and use containment devices and personal protective equipment based on a risk assessment of material potency and exposure potential.

**Conditions for safe storage, including any incompatibilities**
Store in tight container as defined in the USP-NF. This material should be handled and stored per label instructions to ensure product integrity.

### 8. Exposure controls/personal protection

**Occupational exposure limits**
No exposure limits noted for ingredient(s).
Biological limit values
No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls
No open handling. For laboratory operations, use approved ventilation or containment system (biological safety cabinet, ventilated balance enclosure, glovebox). Control exposures to below the occupational exposure level (if available). Select and use containment devices and personal protective equipment based on a risk assessment of exposure potential. Cover all containers for solutions and slurries while being transferred.

Individual protection measures, such as personal protective equipment
Eye/face protection
Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.

Skin protection
Hand protection
Consider double gloves. Wear nitrile or other impervious gloves if skin contact is possible. When the material is dissolved or suspended in an organic solvent, wear gloves that provide protection against the solvent.

Other
Train employees in proper gowning and degowning practices. Wear disposable lab coat, disposable sleeve covers and two pair of gloves as appropriate for the task. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use. Do not wear protective garments in common areas (e.g., cafeterias) or out-of-doors.

Respiratory protection
Use a powered air-purifying respirator (PAPR) with HEPA filters, disposable outerware and head cover for spill cleanup. Choose respiratory protection appropriate to the task and the level of existing engineering controls.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
Pharmacological effects may be seen with occupational exposure. Handling practices in this SDS are recommendations for laboratory use of reference standards. Procedures for any other uses or quantities should be determined after an appropriate assessment.

9. Physical and chemical properties

Appearance
Appearance descriptions are general information and not specific to any USP lot.

Physical state
Solid.

Form
Powder.

Color
White. Cream.

Odor
Odorless.

Odor threshold
Not available.

pH
Not available.

Melting point/freezing point
442.4 - 458.6 °F (228 - 237 °C) (decomposes)

Initial boiling point and boiling range
Not available.

Flash point
Not available.

Evaporation rate
Not available.

Flammability (solid, gas)
Not available.

Upper/lower flammability or explosive limits
Flammability limit - lower (%)
Not available.

Flammability limit - upper (%)
Not available.

Explosive limit - lower (%)
Not available.

Explosive limit - upper (%)
Not available.

Vapor pressure
< 0.0000001 kPa at 25 °C

Vapor density
Not available.

Relative density
Not available.

Solubility(ies)
Solubility (water)
Insoluble.

Solubility (other)
Dilute alkalies: Soluble.
Propylene glycol: Insoluble.
Alcohol: Insoluble.

Partition coefficient (n-octanol/water)
0.93

Auto-ignition temperature
> 680 °F (> 360 °C)

Decomposition temperature
Not available.

Viscosity
Not available.

Material name: Liothyronine
1368008    Version #: 05    Revision date: 10-30-2017    Issue date: 04-10-2009

USP SDS US
Other information

- Chemical family: Thyroxine derivative.
- Molecular formula: C15H12I3NO4
- Molecular weight: 650.98

10. Stability and reactivity

**Reactivity**
The product is stable and non-reactive under normal conditions of use, storage and transport.

**Chemical stability**
Material is stable under normal conditions.

**Possibility of hazardous reactions**
No dangerous reaction known under conditions of normal use.

**Conditions to avoid**
Contact with incompatible materials.

**Incompatible materials**
Strong bases. Strong oxidizing agents.

**Hazardous decomposition products**
NOx. I-. Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

11. Toxicological information

**Information on likely routes of exposure**

- **Inhalation**
  Knowledge about health hazard is incomplete.

- **Skin contact**
  Knowledge about health hazard is incomplete.

- **Eye contact**
  Knowledge about health hazard is incomplete.

- **Ingestion**
  Toxic if swallowed. Based on information from therapeutic use, this material may cause: Hyperthyroidism.

**Symptoms related to the physical, chemical, and toxicological characteristics**
Thyroid hormones: Central nervous system stimulation. Cardiovascular effects. Anxiety.

**Information on toxicological effects**

- **Acute toxicity**
  Toxic if swallowed.

- **Skin corrosion/irritation**
  Knowledge about health hazard is incomplete.

- **Serious eye damage/eye irritation**
  Knowledge about health hazard is incomplete.

- **Respiratory or skin sensitization**
  Knowledge about health hazard is incomplete.

  - **Respiratory sensitization**
    Knowledge about health hazard is incomplete.

  - **Skin sensitization**
    Knowledge about health hazard is incomplete.

  - **Germ cell mutagenicity**
    Knowledge about mutagenicity is incomplete.

- **Carcinogenicity**
  Knowledge about carcinogenicity is incomplete.

  - **IARC Monographs. Overall Evaluation of Carcinogenicity**
    Not listed.

    Not regulated.

  - **US. National Toxicology Program (NTP) Report on Carcinogens**
    Not listed.

  **Reproductive toxicity**
  Based on available data, the classification criteria are not met. Therapeutic use of this material during pregnancy has not been associated with adverse reproductive effects.

  **Specific target organ toxicity - single exposure**
  Knowledge about health hazard is incomplete.

  **Specific target organ toxicity - repeated exposure**
  Causes damage to organs (cardiovascular system, thyroid gland) through prolonged or repeated exposure.

- **Aspiration hazard**
  Based on available data, the classification criteria are not met.

- **Further information**
  Potent pharmacologically active material. Occupational exposure to small amounts may cause physiological effects.

12. Ecological information

- **Ecotoxicity**
  The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

- **Persistence and degradability**
  No data is available on the degradability of this product.

- **Bioaccumulative potential**
  No data is available.
Octanol/water partition coefficient log Kow
0.93

Mobility in soil No data available.
Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

| UN number | UN2811 |
| UN proper shipping name | Toxic solid, organic, n.o.s. (Liothyronine) |
| Transport hazard class(es) | 6.1 |
| Class | 6.1 |
| Subsidiary risk | - |
| Packing group | III |

IATA

| UN number | UN2811 |
| UN proper shipping name | Toxic solid, organic, n.o.s. (Liothyronine) |
| Transport hazard class(es) | 6.1 |
| Class | 6.1 |
| Subsidiary risk | - |
| Packing group | III |
| Other information | Allowed with restrictions. |
| Passenger and cargo aircraft | Allowed with restrictions. |
| Cargo aircraft only | Not applicable. |

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

DOT; IATA

General information It is the shipper's responsibility to determine the correct transport classification at the time of shipment.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D) Not regulated.
CERCLA Hazardous Substance List (40 CFR 302.4) Not listed.
SARA 304 Emergency release notification Not regulated.
Hazard categories
- Immediate Hazard - Yes
- Delayed Hazard - Yes
- Fire Hazard - No
- Pressure Hazard - No
- Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations
- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  Not regulated.
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  Not regulated.
- Safe Drinking Water Act (SDWA)
  Not regulated.

US state regulations
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

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<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
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<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
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<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
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<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
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<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
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<td>European List of Notified Chemical Substances (ELINCS)</td>
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<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
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<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
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*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s) and A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

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<tr>
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<tr>
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