Levothyroxine Sodium, USP

Section 1 Identification of the substance/mixture and of the company/undertaking

Product Identifier:
Identification on the label/ Tradename: Levothyroxine Sodium, USP
Identification of the Product: C_{36}H_{42}F_{2}N_{6}O_{9}
Chemical Name: L-Tyrosine, O-(4-hydroxy-3,5-diodophenyl)-3,5-diodo-, monosodium salt, hydrate

Monosodium L-thyroxine hydrate

Relevant identified uses of the substance and uses advised against:
Identified Uses: Pharma active ingredients
Uses Advised Against: No information available

Name, address, and telephone number of the manufacturer:
Refer to Supplier

Name, address, and telephone number of the supplier:
Encore Scientific 801 West New Orleans Street Broken Arrow, OK, USA 74011
Supplier’s Telephone #: 800-454-2304 Monday to Friday 8:00 am to 6:00 pm (Central time)
24 Hr. Emergency Tel #: INFOTRAC: (800) 535-5053 (Within Continental US and Canada); (352)323-3500 (International)

Section 2 Hazards Identification

Physical hazards: Not classified.
Health hazards:
Specific target organ toxicity, single exposure Category 1 (cardiovascular system)
Specific target organ toxicity, repeated exposure Category 1 (thyroid gland)

Environmental hazards: Not classified
OSHA defined hazards: Not classified

Label elements

Hazard pictograms
GH508 Health Hazard
Signal word
Danger
Hazard statements
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
Section 2 Hazards Identification (Continued)

Precautionary statements:
- **P260** Do not breathe dust/fume/gas/mist/vapors/spray.
- **P280** Wear protective gloves/protective clothing/eye protection/face protection.
- **P264** Wash thoroughly after handling.
- **P308+P313** IF exposed or concerned: Get medical advice/attention.
- **P405** Store locked up.
- **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

Results of PBT and vPvB assessment:
- **PBT**: Not applicable
- **vPvB**: Not applicable.

Section 3 Composition/information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levothyroxine Sodium</td>
<td>25416-65-3</td>
<td>100</td>
</tr>
</tbody>
</table>

Section 4 First aid measures

Description of first aid measures

**Eye Contact:** Rinse with water. Get medical attention if irritation develops and persists.

**Inhalation:** If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

**Ingestion:** Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.

**After skin contact:** If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

**Indication of immediate medical attention and special treatment needed:** Treatment of overdose should be symptomatic and supportive. Administer activated charcoal with sorbitol to decrease absorption. Use beta-adrenergic antagonists such as propranolol, labetalol, or sotalol for treatment of adrenergic findings associated with hyperthyroidism. Bisprolol 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.
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Section 4 First aid measures (Continued)

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.

Section 5 Fire-Fighting measures

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: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...). Some metallic oxides.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS: Wear suitable protective equipment.

FIREFIGHTING EQUIPMENT/INSTRUCTIONS: Use water spray to cool unopened containers. As with all fires, evacuate personnel to a safe area. Fire fighters 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.

FIRE FIGHTING: Alert Emergency Responders and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves.

Section 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.
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Section 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. Use of a designated area is recommended for handling of potent materials.

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.

Section 8 Exposure Controls/Personal Protection

Occupational exposure limits

Exposure limit values

<table>
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<tr>
<th>Industrial Use Material</th>
<th>Type</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Levothyroxine Sodium (CAS 25416-65-3)</td>
<td>TWA</td>
<td>1 micrograms/m³</td>
</tr>
</tbody>
</table>

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

Appropriate engineering controls: Airborne exposure should be controlled primarily by engineering controls such as general dilution ventilation, local exhaust ventilation, or process enclosure. Local exhaust ventilation is generally preferred to general exhaust because it can control the contaminant at its source, preventing dispersion into the work area. An industrial hygiene survey involving air monitoring may be used to determine the effectiveness of engineering controls. Effectiveness of engineering controls intended for use with highly potent materials should be assessed by use of nontoxic surrogate materials.

Eye/face protection: Safety glasses with sideshields are recommended. Face shields or goggles may be required if splash potential exists or if corrosive materials are present. Approved eye protection (e.g., bearing the ANSI Z87 or CSA stamp) is preferred. Maintain eyewash facilities in the work area.

Skin Protection

Hand protection: Chemically compatible gloves. For handling solutions, ensure that the glove material is protective against the solvent being used. Use handling practices that minimize direct hand contact. Employees who are sensitive to natural rubber (latex) should use nitrile or other synthetic nonlatex gloves. Use of powdered latex gloves should be avoided due to the risk of latex allergy.

Other: For handling of laboratory scale quantities, a cloth lab coat is recommended. Where significant quantities are handled, work clothing may be necessary to prevent take-home contamination.
Section 8 Exposure Controls/Personal Protection (Continued)

Thermal hazards: Wear appropriate thermal protective clothing, when necessary.

Respiratory protection: Where respirators are deemed necessary to reduce or control occupational exposures, use NIOSH-approved respiratory protection and have an effective respirator program in place (applicable U.S. regulation OSHA 29 CFR 1910.134).

General hygiene considerations: Handle in accordance with good industrial hygiene and safety practice.

Section 9 Physical and chemical properties

Physical State Solid
Appearance Off-white, light yellow powder.
Odor Odorless
Odor Threshold Not available
pH Not applicable
Melting Point/Range Not available
Boiling Point/Range Not available
Flash Point Not available
Evaporation Rate Not available
Flammability (solid, gas) Not available
Flammability or explosive limits
   Upper Not available
   Lower Not available
Vapor Pressure Not available
Vapor Density Not available
Vapor density Not available
Evaporation rate Not available
Partition coefficient (n-octanol/water): No information available
Viscosity:
   Dynamic: Not applicable.
   Kinematic: Not applicable.
Other information No further relevant information available.

Chemical Family: Thyroxine derivative.
Molecular Formula C₁₅H₁₀I₄NO₄Na x H₂O
Molecular Weight 799.859 g/mol
Section 10 Stability and reactivity

Reactivity

Chemical stability: Material is stable under normal conditions.
Possibility of hazardous reactions: Risk of dust explosion. Reacts with strong acids and alkali. Reacts with strong oxidizing agents.
Conditions to avoid: Contact with incompatible materials.
Incompatible materials: Oxidizing agents.
Hazardous decomposition products: I-. Na2O. NOx. Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

Section 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: Based on information from therapeutic use, this material may cause: Hyperthyroidism.

Acute toxicity: Harmful if swallowed.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
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<tbody>
<tr>
<td>Levothyroxine Sodium (CAS 25416-85-3)</td>
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</tr>
<tr>
<td>Oral</td>
<td>Mouse</td>
<td>&gt; 10000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>&gt; 10000 mg/kg</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Knowledge about health hazard is incomplete.
Serious eye damage/eye irritation: Knowledge about health hazard is incomplete.
Respiratory or Skin Sensitization
  Respiratory sensitization: Knowledge about health hazard is incomplete.
  Skin sensitization: Knowledge about health hazard is incomplete.

Germ cell mutagenicity: Knowledge about health hazard is incomplete.

Mutagenicity
  In vitro assay with human peripheral lymphocytes in whole blood
  Result: No increase in chromosome aberrations or chromosome breakage.

  In vitro comet assay with purified human lymphocytes
  Result: Increased sister chromatid exchange; no increase in multinucleii frequency.
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Section 11 Toxicological information (Continued)

Carcinogenicity: Knowledge about carcinogenicity is incomplete.

IARC Monographs. Overall Evaluation of Carcinogenicity: Not listed.
US. National Toxicology Program (NTP) Report on Carcinogens: Not listed.

Reproductive toxicity: Knowledge about health hazard is incomplete.

Reproductivity
0.25 - 0.3 mg/day Reproductivity study
Result: Cataracts in 38% of the fetuses.
Species: Rat

Specific target organ toxicity-single exposure: Causes damage to organs (cardiovascular system).
Specific target organ toxicity-repeated exposure: Causes damage to organs (thyroid gland) through prolonged or repeated exposure.
Aspiration hazard: Based on available data, the classification criteria are not met.

Section 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: Not available.
Bioaccumulative potential: Not available.
Mobility in soil: Not available.
Other adverse effects: Not available.

Section 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.
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Section 13 Disposal considerations (Continued)

Waste from residues / unused products: Dispose of in accordance with local regulations. 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. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Section 14 Transport information

DOT: Not regulated as dangerous goods.
IATA: Not regulated as dangerous goods.

Transport in bulk according to
Annex II of MARPOL 73/78 and
the IBC Code Not available

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

Section 15 Regulation information

US federal regulations: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. One or more components are not listed on TSCA.

SARA 304 Emergency release notification: Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

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
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Section 15 Regulation information (Continued)

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
- US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
  Not listed.
- US. Massachusetts RTK - Substance List
  Not regulated.
- US. New Jersey Worker and Community Right-to-Know Act
  Not listed.
- US. Pennsylvania RTK - Hazardous Substances
  Not regulated.
- US. Pennsylvania Worker and Community Right-to-Know Law
  Not listed.
- US. Rhode Island RTK
  Not regulated.
- US. California Proposition 65
  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

<table>
<thead>
<tr>
<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>
<td>Yes</td>
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<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
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<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>No</td>
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<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
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<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCSC)</td>
<td>Yes</td>
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<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>No</td>
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<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
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<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).
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).
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Section 16 Other information

Date of Preparation/Last Revision: 06/30/2017/

Further information: This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

Notice to reader: Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.