SAFETY DATA SHEET
Levamisole (hydrochloride)

Section 1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Code: 14874
Product Name: Levamisole (hydrochloride)
Synonyms: (6S)-2,3,5,6-tetrahydro-6-phenyl-imidazo[2,1-b]thiazole, monohydrochloride; NSC 177023; R 12654; L-Tetramisole;

1.2 Relevant identified uses of the substance or mixture and uses advised against:
Relevant identified uses: For research use only, not for human or veterinary use.

1.3 Details of the Supplier of the Safety Data Sheet:
Company Name: Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Web site address: www.caymanchem.com
Information: +1 (734)971-3335

1.4 Emergency telephone number:
Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300
CHEMTREC Outside USA and Canada: +1 (703)527-3887

Section 2. Hazards Identification

2.1 Classification of the Substance or Mixture:
2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]:
Acute Toxicity: Oral, Category 3
Target Organ Systemic Toxicity (repeated exposure), Category 1

2.1.2 Classification according to Directive 1999/45/EC:
T: Toxic
Risk Phrases: R25, R48
For full text of R-phrases: see SECTION 15.

2.2 Label Elements:
2.2.1 Labeling according to Regulation (EC) No 1272/2008 [CLP]:

GHS Signal Word: Danger

GHS Hazard Phrases:
H301: Toxic if swallowed.
H372: Causes damage to organs through prolonged or repeated exposure.

GHS Precaution Phrases:
P264: Wash {hands} thoroughly after handling.
P260: Do not breathe {dust/fume/gas/mist/vapours/spray}.

GHS Response Phrases:
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P330: Rinse mouth.
P314: Get medical attention/advice if you feel unwell.

GHS Storage and Disposal Phrases:
Please refer to Section 7 for Storage and Section 13 for Disposal information.

Multi-region format
2.2.2 Labeling according to Directive 1999/45/EC:

T

2.3 Adverse Human Health Causes damage to organs through prolonged or repeated exposure. Effects and Symptoms: Material may be irritating to the mucous membranes and upper respiratory tract.

- May be harmful by inhalation or skin absorption.
- May cause eye, skin, or respiratory system irritation.
- Toxic if swallowed.
- To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS # / RTECS #</th>
<th>Hazardous Components (Chemical Name) / REACH Registration No.</th>
<th>Concentration</th>
<th>EC No./ EC Index No.</th>
<th>Risk Phrases / GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>16595-80-5</td>
<td>Levamisole hydrochloride</td>
<td>100.0 %</td>
<td>240-654-6</td>
<td>T; R25-48</td>
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<tr>
<td>NJ9960000</td>
<td></td>
<td></td>
<td>NA</td>
<td>Acute Tox.(O) 3: H301</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TOST (RE) 1: H372</td>
</tr>
</tbody>
</table>

Section 4. First Aid Measures

4.1 Description of First Aid No data available.

- **In Case of Inhalation:** Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

- **In Case of Skin Contact:** Immediately wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

- **In Case of Eye Contact:** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Have eyes examined and tested by medical personnel.

- **In Case of Ingestion:** Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.

- **Unsuitable Extinguishing Media:** Use water spray to cool fire-exposed containers.

5.2 Flammable Properties and Hazards:

- **Flash Pt:** No data.

- **Explosive Limits:** LEL: No data. UEL: No data.

- **Autoignition Pt:** No data.

5.3 Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Section 6. Accidental Release Measures

6.1 Protective Precautions, Procedures:
- Avoid raising and breathing dust, and provide adequate ventilation.

6.2 Environmental Precautions:
- Take steps to avoid release into the environment, if safe to do so.

6.3 Methods and Material For Containment and Cleaning Up:
- Contain spill and collect, as appropriate.
- Transfer to a chemical waste container for disposal in accordance with local regulations.

Section 7. Handling and Storage

7.1 Precautions To Be Taken in Handling:
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Avoid prolonged or repeated exposure.

7.2 Precautions To Be Taken in Storing:
- Keep container tightly closed.
- Store in accordance with information listed on the product insert.

Section 8. Exposure Controls/Personal Protection

8.1 Exposure Parameters:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>Britain EH40</th>
<th>France VL</th>
<th>Europe</th>
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</thead>
<tbody>
<tr>
<td>16595-80-5</td>
<td>Levamisole hydrochloride</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>16595-80-5</td>
<td>Levamisole hydrochloride</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

8.2 Exposure Controls:

8.2.1 Engineering Controls (Ventilation etc.):
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

8.2.2 Personal protection equipment:

- **Eye Protection:** Safety glasses
- **Protective Gloves:** Compatible chemical-resistant gloves
- **Other Protective Clothing:** Lab coat
- **Respiratory Equipment:** NIOSH approved respirator, as conditions warrant.

8.3 Work/Hygienic/Maintenance Practices:
- Do not take internally.
- Facilities storing or utilizing this material should be equipped with an eyewash and a safety shower.
- Wash thoroughly after handling.
Section 9. Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Physical States: [ ] Gas       [ ] Liquid       [X] Solid
Appearance and Odor: A crystalline solid
Melting Point: No data.
Boiling Point: No data.
Flash Pt: No data.
Evaporation Rate: No data.
Explosive Limits: LEL: No data.                                    UEL: No data.
Vapor Pressure (vs. Air or mm Hg): No data.
Vapor Density (vs. Air = 1): No data.
Specific Gravity (Water = 1): No data.
Solubility in Water: No data.
Solubility Notes: ~5 mg/ml in PBS (pH 7.2); ~11 mg/ml in EtOH; ~3 mg/ml in DMSO; ~0.1 mg/ml in DMF;
Autoignition Pt: No data.

9.2 Other Information

Percent Volatile: No data.
Molecular Formula & Weight: C11H12N2S • HCl         240.8

Section 10. Stability and Reactivity

10.1 Reactivity: No data available.
10.2 Stability: Unstable [ ]       Stable [ X ]
10.3 Stability Note(s): Stable if stored in accordance with information listed on the product insert.
Polymerization: Will occur [ ]       Will not occur [ X ]
10.4 Conditions To Avoid: No data available.
10.5 Incompatibility - Materials To Avoid: strong oxidizing agents
10.6 Hazardous Decomposition Or Byproducts: carbon dioxide carbon monoxide hydrogen chloride gas nitrogen oxides sulfur oxides
Section 11. Toxicological Information

11.1 Information on Toxicological Effects:
The toxicological effects of this product have not been thoroughly studied.

Levamisole (hydrochloride) - Toxicity Data:
- Oral TDLO (woman): 180 mg/kg/36D;
- Oral LD50 (rat): 180 mg/kg;
- Intraperitoneal LD50 (rat): 42 mg/kg;
- Subcutaneous LD50 (rat): 80 mg/kg;
- Intraperitoneal LD50 (mouse): 34 mg/kg;
- Oral LD50 (mouse): 223 mg/kg;
- Subcutaneous LD50 (mouse): 52 mg/kg;

Chronic Toxicological Effects:
Levamisole (hydrochloride) - Investigated as a mutagen and reproductive effector.

Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

Levamisole (hydrochloride) RTECS Number: NJ5960000

Carcinogenicity:
NTP? No  IARC Monographs? No  OSHA Regulated? No

Section 12. Ecological Information

12.1 Toxicity:
Avoid release into the environment.
Runoff from fire control or dilution water may cause pollution.

Section 13. Disposal Considerations

13.1 Waste Disposal Method:
Dispose in accordance with local, state, and federal regulations.

Section 14. Transport Information

14.1 LAND TRANSPORT (US DOT):
DOT Proper Shipping Name: Toxic solids, organic, n.o.s. (Levamisole (hydrochloride))
DOT Hazard Class: 6.1 - POISON
UN/NA Number: 2811  Packing Group: III

14.1 LAND TRANSPORT (European ADR/RID):
ADR/RID Shipping Name: Toxic solids, organic, n.o.s. (Levamisole (hydrochloride))
UN Number: 2811  Packing Group: III
Hazard Class: 6.1 - POISON

14.3 AIR TRANSPORT (ICAO/IATA):
ICAO/IATA Shipping Name: Toxic solids, organic, n.o.s. (Levamisole (hydrochloride))
UN Number: 2811  Packing Group: III
Hazard Class: 6.1 - POISON  IATA Classification: 6.1

Additional Transport Information:
Transport in accordance with local, state, and federal regulations.
When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.
Section 15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16595-80-5</td>
<td>Levamisole hydrochloride</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Other US EPA or State Lists</th>
</tr>
</thead>
<tbody>
<tr>
<td>16595-80-5</td>
<td>Levamisole hydrochloride</td>
<td>CAA HAP,ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: No</td>
</tr>
</tbody>
</table>

European Community Hazard Symbol codes:

![Hazard Symbol]

European Community Risk and Safety Phrases:

R25  Toxic if swallowed.
R48  Danger of serious damage to health by prolonged exposure.
S22  Do not breathe dust.
S24/25  Avoid contact with skin and eyes.
S28A  After contact with skin, wash immediately with plenty of water.
S36/37/39  Wear suitable protective clothing, gloves and eye/face protection.
S45  In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)

Regulatory Information Statement: This SDS was prepared in accordance with Regulation (EC) No.1272/2008 and European Directive 67/548/EEC as amended.

Section 16. Other Information

Revision Date: 03/27/2014

Additional Information About This Product: No data available.

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