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

1.1 Product Code: 9000683
Product Name: 25-hydroxy Vitamin D3
Synonyms: 4-[2Z]-2-(5S)-5-hydroxy-2-methylenecyclohexylidene]ethylidene]octahydro-alpha,,alpha,,epsilon,,epsilon,,7a-tetramethyl-epsilon.R,1R,3aS,4E,7aR)-1H-indene-1-pentanol; 25-hydroxy Cholecalciferol; RO 8-8892; Rovimix Hy-D; U 32070E;

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
Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300
Alternate Emergency Contact: CHEMTREC Outside USA and Canada: +1 (703)527-3887
Information: Cayman Chemical Company +1 (734)971-3335
Web site address: www.caymanchem.com

Section 2. Hazards Identification

<table>
<thead>
<tr>
<th>GHS Classification</th>
<th>Placard</th>
<th>Key word</th>
<th>GHS hazard phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity: Inhalation, Category 1</td>
<td>Skull and crossbones</td>
<td>Danger</td>
<td>Fatal if inhaled</td>
</tr>
<tr>
<td>Acute Toxicity: Oral, Category 2</td>
<td>Skull and crossbones</td>
<td>Danger</td>
<td>Fatal if swallowed</td>
</tr>
<tr>
<td>Acute Toxicity: Skin, Category 2</td>
<td>Skull and crossbones</td>
<td>Danger</td>
<td>Fatal in contact with skin</td>
</tr>
<tr>
<td>Target Organ Systemic Toxicity (repeated exposure), Category 1</td>
<td>Health hazard</td>
<td>Danger</td>
<td>Causes damage to &lt;target organs&gt; through prolonged or repeated exposure</td>
</tr>
</tbody>
</table>

GHS Hazard Phrases: H330: Fatal if inhaled.
H300: Fatal if swallowed.
H310: Fatal in contact with skin.
H372: Causes damage to organs through prolonged or repeated exposure.

GHS Precaution Phrases:
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P284: Wear respiratory protection. as specified by the manufacturer/supplier or the competent authority.
P264: Wash hands thoroughly after handling.
P262: Do not get in eyes, on skin, or on clothing.
P280: Wear protective gloves/clothing and eye/face protection as specified by the manufacturer/supplier or the competent authority.
P361+364: Take off immediately all contaminated clothing and wash it before reuse.

GHS Response Phrases:
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310: Immediately call a POISON CENTER or doctor/physician.
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P330: Rinse mouth.
P361: Remove/Take off immediately all contaminated clothing.
P302+350: IF ON SKIN: Gently wash with plenty of soap and water.
P321: Specific treatment (see ... on this label) ... reference to supplemental first aid instruction - if immediate administration of antidote is required.
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.

2.3 Adverse Human Health Effects and Symptoms: Causes damage to organs through prolonged or repeated exposure. Fatal if swallowed, in contact with skin or if inhaled. Lachrymator. Material may be irritating to the mucous membranes and upper respiratory tract. May cause eye, skin, or respiratory system irritation. To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

Target Organs: Central nervous system, Bones, Cardiovascular system, Gastrointestinal System, Kidneys.

Medical Conditions Generally Aggravated By Exposure: No data available.

Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>Concentration</th>
<th>EC#</th>
<th>Risk Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 25-hydroxy Vitamin D3</td>
<td>19356-17-3</td>
<td>100.0 %</td>
<td>242-990-9</td>
<td>R26/27/28-48</td>
</tr>
</tbody>
</table>

Section 4. First Aid Measures

4.1 Description of First Aid Measures:

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

4.1.2 In Case of Skin Contact: Immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

4.1.3 In Case of Eye Contact: Hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.

4.1.4 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.

4.2 Important Symptoms and Effects, Both Acute and Delayed: Exposure may cause: Dizziness, weakness, headache, nausea, and vomiting.

4.3 Indication of any immediate medical attention and special treatment needed: No data available.

Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray. Use water spray to cool fire-exposed containers.

Unsuitable Extinguishing Media: A solid water stream may be inefficient.

5.2 Flammable Properties and Hazards: No data available.

Flash Pt: No data.

Autoignition Pt: No data available.

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

Hazardous Combustion Products: No data available.

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, Protective Equipment and Emergency Procedures: Avoid raising and breathing dust, and provide adequate ventilation. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).
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.

Hazard Label Information: Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.

Section 8. Exposure Controls/Personal Protection

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-hydroxy Vitamin D3</td>
<td>19356-17-3</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
</tbody>
</table>

Hazardous Components (Chemical Name) France VL | Britain EH40 | Europe

<table>
<thead>
<tr>
<th>Protective Equipment Summary - Hazard Label Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatible chemical-resistant gloves</td>
</tr>
<tr>
<td>Eye wash station in work area</td>
</tr>
<tr>
<td>Lab coat</td>
</tr>
<tr>
<td>Safety glasses</td>
</tr>
<tr>
<td>Vent Hood</td>
</tr>
</tbody>
</table>

8.2.1 Engineering Controls (Ventilation etc.):

8.2.2.1 Eye Protection: Safety glasses

8.2.2.2 Protective Gloves: Compatible chemical-resistant gloves

8.2.2.3 Respiratory Equipment (Specify Type):

8.2.3 Environmental Exposure Controls:

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.

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:

~0.3 mg/ml in 1:2 EtOH:PBS (pH 7.2); ~10 mg/ml in EtOH, DMF, & DMSO;

Autoignition Pt:

No data.
Explosive Properties: No data available.
Oxidizing Properties: No data available.

9.2 Other Information

Percent Volatile: No data.
Formula: C27H44O2
Molecular Weight: 400.60

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.
10.4 Conditions To Avoid: No data available.
10.5 Polymerization: Will occur [   ] Will not occur [ X ]
10.6 Incompatibility - Materials To Avoid: acid anhydrides
acid chlorides
strong oxidizing agents
10.6 Hazardous Decomposition Or Byproducts: carbon dioxide
carbon monoxide

Section 11. Toxicological Information

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

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. (25-hydroxy Vitamin D3)
   DOT Hazard Class: 6.1
   DOT Hazard Label: POISON
   UN/NA Number: 2811
   Packing Group: II
14.1 LAND TRANSPORT (European ADR/RID)
   ADR/RID Shipping Name: Toxic solids, organic, n.o.s. (25-hydroxy Vitamin D3)
   UN Number: 2811
   Hazard Class: 6.1 - POISON
   Packing Group: II
14.3 AIR TRANSPORT (ICAO/IATA)
   ICAO/IATA Shipping Name: Toxic solids, organic, n.o.s. (25-hydroxy Vitamin D3)
UN Number: 2811
Hazard Class: 6.1 - POISON
Packing Group: II
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

Section 15. Regulatory Information

European Community Hazard Symbol codes T+: Very Toxic

European Community Risk and Safety Phrases
- R26/27/28 - Very toxic by inhalation, in contact with skin and 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.
- S28 - After contact with skin, wash immediately with plenty of soap-suds.
- 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.)

US EPA SARA Title III

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>Sec.302 (EHS)</th>
<th>Sec.304 RQ</th>
<th>Sec.313 (TRI)</th>
<th>Sec.110</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 25-hydroxy Vitamin D3</td>
<td>19356-17-3</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Other US EPA or State Lists

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>CAA HAP,ODC</th>
<th>CWA NPDES</th>
<th>TSCA</th>
<th>CA PROP.65</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 25-hydroxy Vitamin D3</td>
<td>19356-17-3</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

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: 05/28/2013

Company Policy or Disclaimer

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required