1. Product and Company Identification

Product Code: 13188
Product Name: Thrombin (human)

Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335
Synonyms: Activated Factor II [IIa];

2. Hazards Identification

Emergency Overview: Biohazard.
Avoid accidental inoculation, intravenous injection or contact with open wounds.
Thrombin acts to clot blood and may be fatal if it enters the bloodstream.
Target Organ(s): Vascular system.

Route(s) of Entry:
Inhalation? Yes  Skin? Yes  Eyes? Yes  Ingestion? Yes  Other: Injection

Health Hazards (Acute and Chronic):
Handle as if capable of transmitting infectious agents.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this product have not been fully evaluated.

Signs and Symptoms Of Exposure:
Exposure may cause sensitization.
Prolonged or repeated skin contact may cause dermatitis.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>Concentration</th>
<th>EC#</th>
<th>RTECS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thrombin</td>
<td>9002-04-4</td>
<td>0.1 %</td>
<td>232-648-7</td>
<td>XO8950000</td>
</tr>
<tr>
<td>2. Water</td>
<td>7732-18-5</td>
<td>&gt;99.0 %</td>
<td>231-791-2</td>
<td>ZC0110000</td>
</tr>
</tbody>
</table>

4. First Aid Measures

Emergency and First Aid Procedures:
If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, 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.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.
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.

5. Fire Fighting Measures

Flash Pt: No data.
Explosive Limits: LEL: No data. UEL: No data.
Special Fire Fighting Procedures: 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.
Unusual Fire and Explosion Hazards: Emits toxic fumes under fire conditions.
Hazardous Combustion Products: No data available.
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.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:
Avoid release into the environment.
Avoid breathing vapors 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).
Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
After removal, flush contaminated area and all cleaning materials with a 10% bleach aqueous solution.

7. Handling and Storage

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

Precautions To Be Taken in Handling:
Avoid breathing (dust, vapor, mist, gas).
Avoid prolonged or repeated exposure.

Precautions To Be Taken in Storing:
Keep tightly closed.
Store at correct temperature.

8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name) | CAS # | OSHA PEL | ACGIH TLV | Other Limits
--- | --- | --- | --- | ---
1. Thrombin | 9002-04-4 | No data. | No data. | No data.

Protective Equipment Summary - Hazard Label Information:
Compatible chemical-resistant gloves
Eye wash station in work area
Lab coat
Safety glasses
Safety shower in work area
Vent Hood
Respiratory Equipment (Specify Type):
NIOSH approved respirator, as conditions warrant.

Eye Protection:
Safety glasses

Protective Gloves:
Compatible chemical-resistant gloves

Other Protective Clothing:
Lab coat

Ventilation:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Work/Hygiene/Maintenance Practices:
Do not take internally.
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States: [ ] Gas [X] Liquid [ ] Solid
Melting Point: No data.
Boiling Point: No data.
Autoignition Pt: No data.
Flash Pt: No data.
Explosive Limits:
LEL: No data. UEL: No data.
Specific Gravity (Water = 1):
No data.
Bulk density: No data.
Vapor Pressure (vs. Air or mm Hg): No data.
Vapor Density (vs. Air = 1): No data.
Evaporation Rate (vs Butyl Acetate=1): No data.
Solubility in Water: No data.
Percent Volatile: No data.
Thrombin (human)

Heat Value: No data.
Particle Size: No data.
Corrosion Rate: No data.

10. Stability and Reactivity

Stability: Unstable [ ] Stable [ ]
Conditions To Avoid - Instability: No data available.
Incompatibility - Materials To Avoid: No data available.
Hazardous Decomposition Or Byproducts: No data available.
Possibility of Hazardous Reactions: Will occur [ ] Will not occur [ ]
Conditions To Avoid - Hazardous Reactions: No data available.

11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.
Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

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

13. Disposal Considerations

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

14. Transport Information

LAND TRANSPORT (US DOT)
DOT Proper Shipping Name
Not dangerous goods.
LAND TRANSPORT (European ADR/RID)
ADR/RID Shipping Name
Not dangerous goods.
AIR TRANSPORT (ICAO/IATA)
ICAO/IATA Shipping Name
Not dangerous goods.
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

European Community Hazard Symbol codes
No data available.
European Community Risk and Safety Phrases
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.

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. Thrombin</td>
<td>9002-04-4</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2. Water</td>
<td>7732-18-5</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

US EPA CAA, CWA, TSCA

<table>
<thead>
<tr>
<th>Hazardous Components (Chemical Name)</th>
<th>CAS #</th>
<th>EPA CAA</th>
<th>EPA CWA NPDES</th>
<th>EPA TSCA</th>
<th>HPV/LPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thrombin</td>
<td>9002-04-4</td>
<td>HAP, ODC ()</td>
<td>No</td>
<td>Inventory</td>
<td></td>
</tr>
<tr>
<td>2. Water</td>
<td>7732-18-5</td>
<td>HAP, ODC ()</td>
<td>No</td>
<td>Inventory</td>
<td></td>
</tr>
</tbody>
</table>
16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

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