1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name: Warfarin
Product Code: SC-205888

Recommended use of the chemical and restrictions on use
For research use only. Not intended for diagnostic or therapeutic use.

Details of the supplier of the safety data sheet
Santa Cruz Biotechnology, Inc.
10410 Finnell Street
Dallas, TX 75220
831.457.3800
800.457.3801
scbt@scbt.com

Emergency telephone number
Chemtrec
1.800.424.9300 (Within USA)
+1.703.527.3887 (Outside USA)

2. HAZARDS IDENTIFICATION

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification
Acute toxicity - Oral: Category 2
Acute toxicity - Dermal: Category 4
Reproductive toxicity: Category 1A
Specific target organ toxicity (repeated exposure): Category 1

Label elements
Signal word: Danger
Hazard statements:
- Fatal if swallowed
- Harmful in contact with skin
- May damage fertility or the unborn child
- Causes damage to organs through prolonged or repeated exposure

Symbols/Pictograms

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed or concerned: Get medical advice/attention
IF ON SKIN: Wash with plenty of soap and water
Call a POISON CENTER or doctor/physician if you feel unwell
Wash contaminated clothing before reuse
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth
Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Hazards not otherwise classified (HNOC)
Not applicable

Other Information

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health hazards</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flammability</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Stability</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Physical and chemical properties</td>
<td>-</td>
</tr>
</tbody>
</table>

HMIS
Health hazards 4
Flammability 1
Physical hazards 0
Personal protection -

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight %</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>81-81-2</td>
<td>&gt;98</td>
<td>= 1.6 mg/kg ( Rat ) = 1600 µg/kg ( Rat )</td>
<td>= 1400 mg/kg ( Rat )</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First Aid Measures
General advice
Immediate medical attention is required.

Eye contact
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately.

Skin Contact
Immediate medical attention is required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

Inhalation
Immediate medical attention is required Remove to fresh air If not breathing, give artificial respiration Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation

Ingestion
Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Drink plenty of water.

Self-protection of the first aider
Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed
Symptoms
No information available.

Indication of any immediate medical attention and special treatment needed
Note to physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media
None.

Specific hazards arising from the chemical
Specific hazards arising from the chemical
Hazardous combustion products Carbon oxides.

**Explosion data**
- Sensitivity to Mechanical Impact: No information available.
- Sensitivity to Static Discharge: No information available.

**Protective equipment and precautions for firefighters**
Protective equipment and precautions for firefighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**
- **Personal precautions** Use personal protective equipment as required. Keep people away from and upwind of spill/leak.

**Environmental precautions**
- **Environmental precautions** Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. See Section 12 for additional Ecological Information. Should not be released into the environment.

**Methods and material for containment and cleaning up**
- **Methods for containment** Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.
- **Methods for cleaning up** Use personal protective equipment as required. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Take up mechanically, placing in appropriate containers for disposal. Avoid creating dust. Clean contaminated surface thoroughly.

### 7. HANDLING AND STORAGE

**Precautions for safe handling**
- **Advice on safe handling** Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product.

**Conditions for safe storage, including any incompatibilities**
- **Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Store at room temperature.
- **Incompatible materials** None known based on information supplied.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**
- **Exposure Guidelines**
  - **Other Information** Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin 81-81-2</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>IDLH: 100 mg/m³</td>
</tr>
<tr>
<td></td>
<td>(vacated) TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

**NIOSH IDLH** Immediately Dangerous to Life or Health

Santa Cruz Biotechnology, Inc. www.scbt.com
Appropriate engineering controls

Engineering Controls
- Showers
- Eyewash stations
- Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection
- Tight sealing safety goggles.

Skin and Body Protection
- Wear protective gloves and protective clothing.

Respiratory protection
- If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations
- When using do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Wash hands thoroughly after handling. Keep away from food, drink and animal feeding stuffs.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>162 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash point</td>
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</tr>
<tr>
<td>Density</td>
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</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
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</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific gravity</td>
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</tr>
<tr>
<td>Water solubility</td>
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<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
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<tr>
<td>Decomposition temperature</td>
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</tr>
<tr>
<td>Kinematic viscosity</td>
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<tr>
<td>Explosive properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

| Reactivity                       | Not applicable                              |
| Chemical stability               | Stable under recommended storage conditions.|
| Possibility of Hazardous Reactions| None under normal processing.               |
| Hazardous polymerization         | No information available                    |
| Conditions to avoid              | Extremes of temperature and direct sunlight.|
| Incompatible materials           | Strong oxidizing agents.                    |
| Hazardous Decomposition Products | Carbon oxides.                              |

11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure

Inhalation               No data available.
Eye contact             No data available.
Skin Contact            No data available.
Ingestion               No data available.

Information on toxicological effects

Symptoms                No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity        May cause adverse effects on the bone marrow and blood-forming system.
Target Organ Effects    Blood, Central Vascular System (CVS).

Numerical measures of toxicity - Product Information

Unknown acute toxicity  No information available
The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)           5  mg/kg
ATEmix (dermal)         1400  mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity             May cause long lasting harmful effects to aquatic life
0% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Persistence and degradability No information available.
Bioaccumulation          No information available.
Mobility                 No information available.

13. DISPOSAL CONSIDERATIONS

Disposal of wastes      Disposal should be in accordance with applicable regional, national and local laws and regulations. Should not be released into the environment.
Contaminated packaging  Do not reuse container.
Other Information       Waste codes should be assigned by the user based on the application for which the product was used.
US EPA Waste Number     U248 P001

14. TRANSPORT INFORMATION

DOT
UN/ID no                UN2811
Hazard Class            6.1
Packing Group           I
Proper shipping name    Toxic solids, organic, n.o.s.
Description            UN2811, Toxic solids, organic, n.o.s. (Warfarin), 6.1, I, Marine pollutant, POISON
Marine pollutant        This product contains a chemical which is listed as a marine pollutant according to DOT
Emergency Response Guide Number 154

IMDG
UN/ID no: UN2811
Hazard Class: 6.1
Packing Group: I
Proper shipping name: Toxic solid, organic, n.o.s.
Description: UN2811, Toxic solid, organic, n.o.s. (Warfarin), 6.1, I, Marine pollutant
Special Provisions: 274
EmS-No: F-A, S-A
Marine pollutant: This product contains a chemical which is listed as a marine pollutant according to IMDG/IMO

IATA
UN/ID no: UN2811
Hazard Class: 6.1
Packing Group: I
Proper shipping name: Toxic solid, organic, n.o.s.
Description: UN2811, Toxic solid, organic, n.o.s. (Warfarin), 6.1, I

15. REGULATORY INFORMATION

International Inventories
All of the components in the product are on the following Inventory lists:
- TSCA (United States)
- DSL/NDSL (Canada)
- EINECS/ELINCS (Europe)
- AICS (Australia)
- KECL (South Korea)
- IECSC (China)
- ENCS (Japan)
- PICCS (Philippines)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>KECL</th>
<th>PICCS</th>
<th>AICS</th>
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</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

X - Listed
- TSCA: United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL: Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS: European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS: Japan Existing and New Chemical Substances
- IECSC: China Inventory of Existing Chemical Substances
- KECL: Korean Existing and Evaluated Chemical Substances
- PICCS: Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
- Acute health hazard: No
- Chronic Health Hazard: Yes
- Fire hazard: No
- Sudden release of pressure hazard: No
- Reactive hazard: No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin - 81-81-2</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

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## 16. OTHER INFORMATION

**Revision note**
No information available

**Disclaimer**
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

*End of Safety Data Sheet*