Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier
Product Name 2,5-Anhydro-D-mannitol
Product Code SC-220807
EC No 255-221-7
CAS No 41107-82-8
Pure substance/mixture Substance

1.2. Relevant identified uses of the substance or mixture and uses advised against
For research use only. Not intended for diagnostic or therapeutic use.

1.3. 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

Santa Cruz Biotechnology, Inc.
Bergheimer Str. 89-2
69115 Heidelberg, Germany
+49.6221.4503 0
+1.800.457.3801
europe@scbt.com

1.4. Emergency telephone number
Chemtrec 800.424.9300 (Within USA)
1.703.527.3887 (Outside USA)

Section 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
Regulation (EC) No 1272/2008
Skin corrosion/irritation Category 2 - (H315)
Serious eye damage/eye irritation Category 2 - (H319)
Specific target organ toxicity (single exposure) Category 3 - (H335)

Classification according to 67/548/EEC
Xi - Irritant
R-code(s) Xi;R36/37/38

2.2. Label Elements
Signal word Warning
Symbols/Pictograms

Hazard statements
H335 - May cause respiratory irritation
H315 - Causes skin irritation
H319 - Causes serious eye irritation

EUH210 - Safety data sheet available on request
Precautionary Statements - EU (§28, 1272/2008)
P321 - Specific treatment (see Emergency Phone Number on this label)

2.3. Other Hazards
General Hazards Not applicable
Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Molecular Weight 164.16
Formula C₆H₁₂O₅

3.1 Substances

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EC No</th>
<th>CAS No</th>
<th>Weight %</th>
<th>Classification according to 67/548/EEC</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
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<tbody>
<tr>
<td>2,5-Anhydro-D-mannitol</td>
<td>Present</td>
<td>41107-82-8</td>
<td>100</td>
<td>Xi; R36/37/38</td>
<td>STOT SE 3 (H335) Eye Irrit. 2 (H319) Skin Irrit. 2 (H315)</td>
</tr>
</tbody>
</table>

Full text of R-phrases: see section 16
Full text of H- and EUH-phrases: see section 16

Section 4: FIRST AID MEASURES

4.1. Description of first aid measures

General advice
If symptoms persist, call a physician.

Inhalation
Remove to fresh air. If symptoms persist, call a physician. Artificial respiration and/or oxygen may be necessary. Call a physician. Immediate medical attention is not required. Move to fresh air in case of accidental inhalation of vapors.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician. Wash contaminated clothing before reuse. Wash off immediately with plenty of water. Immediate medical attention is not required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

Eye contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician. 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.

Ingestion
Immediate medical attention is not required. Rinse mouth. Drink plenty of water. Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.

Self-protection of the first aider
Use personal protective equipment as required.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical No information available
Hazardous combustion products Carbon oxides.

5.3. Advice for firefighters

Special protective equipment for fire-fighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Section 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
   Personal precautions Use personal protective equipment as required. Avoid contact with eyes and skin. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.
   For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions
   Environmental precautions Prevent entry into waterways, sewers, basements or confined areas. Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up
   Methods for containment Prevent further leakage or spillage if safe to do so.
   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. Soak up with inert absorbent material. Dam up. Pick up and transfer to properly labeled containers. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Take precautionary measures against static discharges.

6.4. Reference to other sections
   See Section 12: ECOLOGICAL INFORMATION.

Section 7: HANDLING AND STORAGE

7.1. Precautions for safe handling
   Advice on safe handling Ensure adequate ventilation, especially in confined areas. Use personal protective equipment as required. Use with local exhaust ventilation. Do not breathe dust/fume/gas/mist/vapors/spray.
   General Hygiene Considerations When using do not eat, drink or smoke. Wash contaminated clothing before reuse. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

7.3. Specific end use(s)
   Risk Management Methods (RMM) The information required is contained in this Material Safety Data Sheet.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters
   Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
   Derived No Effect Level (DNEL) No information available
   Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls
   Engineering Controls Showers
   Eyewash stations
   Ventilation systems
   Eye/face protection Tight sealing safety goggles. Face protection shield.
   Skin and Body Protection Suitable protective clothing. Apron. Gloves made of plastic or rubber.
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.

Environmental exposure controls

Do not allow into any sewer, on the ground or into any body of water.

Section 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>
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<tr>
<td>Appearance</td>
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</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>101 °C</td>
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<tr>
<td>Boiling point</td>
<td>416.24 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>205.53 °C</td>
</tr>
<tr>
<td>Density</td>
<td>1.48 g/cm³</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
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</tr>
<tr>
<td>Lower flammability limit</td>
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<tr>
<td>Vapor pressure</td>
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<tr>
<td>Vapor density</td>
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<tr>
<td>Specific gravity</td>
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<tr>
<td>Water solubility</td>
<td>No information available</td>
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<tr>
<td>Solubility in other solvents</td>
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<tr>
<td>Partition coefficient</td>
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<tr>
<td>Autoignition temperature</td>
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</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
</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>

Section 10: STABILITY AND REACTIVITY

10.1. Reactivity

Reactivity

Not applicable

10.2. Chemical stability

Stability

Stable under recommended storage conditions.

Sensitivity to Mechanical Impact

No information available.

Sensitivity to Static Discharge

No information available.

10.3. Possibility of hazardous reactions

Hazardous polymerization

No information available.

Possibility of Hazardous Reactions

None under normal processing.

10.4. Conditions to avoid

Conditions to avoid

Extremes of temperature and direct sunlight.

10.5. Incompatible materials

Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Hazardous Decomposition Products

Carbon oxides.

Section 11: TOXICOLOGICAL INFORMATION
11.1. Information on toxicological effects

**Acute toxicity**

Product Information

Product does not present an acute toxicity hazard based on known or supplied information.

Unknown acute toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

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**Section 12: ECOLOGICAL INFORMATION**

12.1. Toxicity

Ecotoxicity

May cause long lasting harmful effects to aquatic life.

Unknown aquatic toxicity

100% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

12.2. Persistence and degradability

Persistence and degradability

No information available.

12.3. Bioaccumulative potential

Bioaccumulation

No information available.

12.4. Mobility in soil

Mobility

No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

No information available.

12.6. Other adverse effects

Other adverse effects

No information available

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**Section 13: DISPOSAL CONSIDERATIONS**

13.1. Waste treatment methods

Waste from residues/unused products

Disposal should be in accordance with applicable regional, national and local laws and regulations.

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.

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**Section 14: TRANSPORT INFORMATION**

14.1 UN/ID no

14.2 Proper shipping name

14.3 Hazard Class

Subsidiary hazard class / Labels

14.4 Packing Group

14.5 Environmental Hazard

14.6 Special Provisions

<table>
<thead>
<tr>
<th>RID / ADR</th>
<th>IMDG</th>
<th>ICAO (air) / IATA</th>
</tr>
</thead>
<tbody>
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<tr>
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</table>
Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National Regulations

European Union
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

International Inventories
All of the components in the product are on the following Inventory lists
Europe (EINECS/ELINCS/NLP)

<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>2,5-Anhydro-D-mannitol</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</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

15.2. Chemical safety assessment
Chemical Safety Report: No information available

Section 16: OTHER INFORMATION

Full text of R-phrases referred to under sections 2 and 3: No information available
R36/37/38 - Irritating to eyes, respiratory system and skin

Full text of H-Statements referred to under sections 2 and 3: H335 - May cause respiratory irritation
H319 - Causes serious eye irritation
H315 - Causes skin irritation

Revision note
No information available.

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

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