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

<table>
<thead>
<tr>
<th>Product identifier</th>
<th>Ethyl pyruvate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>SC-257508</td>
</tr>
<tr>
<td>Product Code</td>
<td></td>
</tr>
</tbody>
</table>

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

2. HAZARDS IDENTIFICATION

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

Classification
Flammable liquids

Label elements
Signal word: Warning
Hazard statements: FLAMMABLE LIQUID AND VAPOR

Precautionary Statements - Prevention
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
IF exposed or concerned: Get medical advice/attention
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
In case of fire: Use CO2, dry chemical, or foam for extinction
Store in a well-ventilated place. Keep cool
Dispoese of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Not applicable

Other Information

Santa Cruz Biotechnology, Inc.  www.scbt.com
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Molecular Weight</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>617-35-6</td>
<td>116.12</td>
<td>C₅H₈O₃</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Weight %</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl pyruvate</td>
<td>&gt;98</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First Aid Measures
General advice
Immediate medical attention is required. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). If symptoms persist, call a physician.

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.

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

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.

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
Remove all sources of ignition. Use personal protective equipment as required.

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
No information available.

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
Remove all sources of ignition. Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. 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. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

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
Pick up and transfer to properly labeled containers. Dam up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Soak up with inert absorbent material.

7. HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Ensure adequate ventilation, especially in confined areas. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Take precautionary measures against static discharges. Use spark-proof tools and explosion-proof equipment. All equipment used when handling the product must be grounded. Use with local exhaust ventilation. Use personal protective equipment as required. Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities
Storage Conditions
Keep tightly closed in a dry and cool place. Keep in properly labeled containers. Keep containers tightly closed in a cool, well-ventilated place. May form explosive peroxides. Store at 4 °C.
Incompatible materials
None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure Guidelines
This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

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. Face protection shield.
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.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>-58 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>144 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>46 °C CC (closed cup)</td>
</tr>
<tr>
<td>Density</td>
<td>1.05 g/mL</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>10.8%</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>1.6%</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>3.09</td>
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<tr>
<td>Vapor density</td>
<td>4.0</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>
<td>Decomposition temperature</td>
<td>No information available</td>
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<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
May form explosive peroxides.
Possibility of Hazardous Reactions
None under normal processing.
Hazardous polymerization
No information available.
Conditions to avoid
Heat, flames and sparks.
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
Skin Contact
Ingestion

Information on toxicological effects
Symptoms

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

Numerical measures of toxicity - Product Information
Unknown acute toxicity

12. ECOLOGICAL INFORMATION

Ecotoxicity
May cause long lasting harmful effects to aquatic life
100% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Persistence and degradability
Bioaccumulation
Mobility

13. DISPOSAL CONSIDERATIONS

Disposal of wastes
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.

14. TRANSPORT INFORMATION

DOT
UN/ID no
3
Packing Group
III
Proper shipping name
Esters, n.o.s.
Description
UN3272, Esters, n.o.s., 3, III
Emergency Response Guide Number
127

IMDG
UN/ID no
3
Packing Group
III
Proper shipping name
Esters, n.o.s.
Description
UN3272, Esters, n.o.s. (Ethyl pyruvate), 3, III, (46°C c.c.)
Special Provisions
223, 274
EmS-No
F-E, S-D

IATA
UN/ID no  UN3272
Hazard Class  3
Packing Group  III
Proper shipping name  Esters, n.o.s.
Description  UN3272, Esters, n.o.s. (Ethyl pyruvate), 3, III

15. REGULATORY INFORMATION

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

<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>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl pyruvate</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</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  Yes
Chronic Health Hazard  No
Fire hazard  Yes
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 does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
This product does not contain any substances regulated by state right-to-know regulations

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