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

<table>
<thead>
<tr>
<th>Product identifier</th>
<th>Heptaldehyde</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>Heptaldehyde</td>
</tr>
<tr>
<td>Product Code</td>
<td>SC-250089</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).

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin corrosion/irritation</td>
<td></td>
</tr>
<tr>
<td>Flammable liquids</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Label elements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal word</td>
<td>Warning</td>
</tr>
<tr>
<td>Hazard statements</td>
<td>Causes skin irritation Flammable liquid and vapor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautionary Statements - Prevention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash face, hands and any exposed skin thoroughly after handling</td>
<td></td>
</tr>
<tr>
<td>Wear protective gloves/protective clothing/eye protection/face protection</td>
<td></td>
</tr>
<tr>
<td>Keep away from heat/sparks/open flames/hot surfaces. — No smoking</td>
<td></td>
</tr>
<tr>
<td>Keep container tightly closed</td>
<td></td>
</tr>
<tr>
<td>Ground/bond container and receiving equipment</td>
<td></td>
</tr>
<tr>
<td>Use only non-sparking tools</td>
<td></td>
</tr>
<tr>
<td>Take precautionary measures against static discharge</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautionary Statements - Response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IF exposed or concerned: Get medical advice/attention</td>
<td></td>
</tr>
<tr>
<td>IF skin irritation occurs: Get medical advice/attention</td>
<td></td>
</tr>
<tr>
<td>IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower</td>
<td></td>
</tr>
<tr>
<td>Wash contaminated clothing before reuse</td>
<td></td>
</tr>
<tr>
<td>In case of fire: Use CO2, dry chemical, or foam for extinction</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautionary Statements - Storage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Store in a well-ventilated place. Keep cool</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautionary Statements - Disposal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispose of contents/container to an approved waste disposal plant</td>
<td></td>
</tr>
</tbody>
</table>
Hazards not otherwise classified (HNOC)
Hazards not otherwise classified (HNOC)  Not applicable

Other Information
Other hazards  Harmful to aquatic life with long lasting effects. Toxic to aquatic life.

NFPA  Health hazards  2  Flammability  3  Stability  0  Physical and chemical properties  -
HMIS  Health hazards  2  Flammability  3  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>Heptaldehyde</td>
<td>111-71-7</td>
<td>&gt;98</td>
<td>= 3200 mg/kg (Rat)</td>
<td>&gt; 5 g/kg (Rabbit)</td>
<td>&gt; 4.7 mg/L (Rat) 4 h &gt; 18400 mg/m³ (Rat) 4 h</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First Aid Measures
General advice  Consult a physician if necessary. Remove to fresh air.
Eye contact  Wash with plenty of water.
Skin Contact  Wash skin with soap and water.
Inhalation  Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration.
Ingestion  Never give anything by mouth to an unconscious person. Clean mouth with water.

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
Ensure adequate ventilation, especially in confined areas.

Environmental precautions
Environmental precautions
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.

7. HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities
Storage Conditions
May form explosive peroxides. Store at room temperature.
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
Wear safety glasses with side shields (or 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
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State
liquid
Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>-43 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>153 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>35 °C</td>
</tr>
<tr>
<td>Liquid Density</td>
<td>0.817 g/mL</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>5.2%</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>1.1%</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>5.0 mmHg</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>No information available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>2.5</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>205 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No information available</td>
</tr>
<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
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
No information available.

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)
3200 mg/kg

ATEmix (dermal)
5000 mg/kg
12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptaldehyde 111-71-7</td>
<td>-</td>
<td>12: 96 h Oncorhynchus mykiss mg/L LC50 static</td>
<td>-</td>
<td>43 - 69: 48 h Daphnia magna mg/L EC50</td>
</tr>
</tbody>
</table>

0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Mobility
No information available.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Partition coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptaldehyde 111-71-7</td>
<td>2.8</td>
</tr>
</tbody>
</table>

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.

14. TRANSPORT INFORMATION

DOT
UN/ID no UN3056
Hazard Class 3
Packing Group III
Proper shipping name n-Heptaldehyde
Description UN3056, n-Heptaldehyde, 3, III, Marine pollutant
Marine pollutant This product contains a chemical which is listed as a marine pollutant according to DOT
Emergency Response Guide Number 129

IMDG
UN/ID no UN3056
Hazard Class 3
Packing Group III
Proper shipping name n-Heptaldehyde
Description UN3056, n-Heptaldehyde, 3, III, (35°C c.c.)
EmS-No F-E, S-D

IATA
UN/ID no UN3056
Hazard Class 3
Packing Group III
Proper shipping name n-Heptaldehyde
Description UN3056, n-Heptaldehyde, 3, III
ERG Code 3L

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>Heptaldehyde</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 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