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

1.1. Product identification

Product Description: L(-)-Carvone
Cat No.: 154590000; 154590050; 154591000; 154595000
Synonyms: (R)-(-)-p-Mentha-6,8-dien-2-one
CAS-No: 6485-40-1
EC-No.: 229-352-5
Molecular Formula: C10 H14 O

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: Laboratory chemicals.
Uses advised against: No Information available

1.3. Details of the supplier of the safety data sheet

Company: Acros Organics BVBA
Janssen Pharmaceuticaalaan 3a
2440 Geel, Belgium
E-mail address: begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information US call: 001-800-ACROS-01 / Europe call: +32 14 57 52 11
Emergency Number US: 001-201-796-7100 / Europe: +32 14 57 52 99
CHEMTREC Tel. No.US: 001-800-424-9300 / Europe: 001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards
Based on available data, the classification criteria are not met

Health hazards
Skin Sensitization Category 1

Environmental hazards
Based on available data, the classification criteria are not met

2.2. Label elements
SAFETY DATA SHEET

L(-)-Carvone

Revision Date 27-Oct-2015

Signal Word  Warning

Hazard Statements
  H317 - May cause an allergic skin reaction
  Combustible liquid

Precautionary Statements
  P280 - Wear protective gloves/ protective clothing
  P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
  P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention

2.3. Other hazards
  No information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>EC-No.</th>
<th>Weight %</th>
<th>CLP Classification - Regulation (EC) No 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)-Carvone</td>
<td>6485-40-1</td>
<td>EEC No. 229-352-5</td>
<td>&gt; 99</td>
<td>Skin Sens. 1 (H317)</td>
</tr>
</tbody>
</table>

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact  Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact  Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Ingestion    Do not induce vomiting. Obtain medical attention.

Inhalation   Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.

Protection of First-aiders  Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

  Breathing difficulties.  . May cause allergic skin reaction. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

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

Notes to Physician  Treat symptomatically.
SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Combustible material. Flammable. Containers may explode when heated.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO₂).

5.3. Advice for firefighters

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

Remove all sources of ignition. Take precautionary measures against static discharges.

6.2. Environmental precautions

See Section 12 for additional ecological information.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Ensure adequate ventilation. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

Use in laboratories

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.

Biological limit values
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS70 General methods for sampling airborne gases and vapours

<table>
<thead>
<tr>
<th>Derived No Effect Level (DNEL)</th>
<th>No information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route of exposure</td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
</tr>
<tr>
<td>Acute effects (local)</td>
<td></td>
</tr>
<tr>
<td>Acute effects (systemic)</td>
<td></td>
</tr>
<tr>
<td>Chronic effects (local)</td>
<td></td>
</tr>
<tr>
<td>Chronic effects (systemic)</td>
<td></td>
</tr>
</tbody>
</table>

Predicted No Effect Concentration (PNEC)
No information available.

8.2. Exposure controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Personal protective equipment

<table>
<thead>
<tr>
<th>Eye Protection</th>
<th>Hand Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goggles (European standard - EN 166)</td>
<td>Protective gloves</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>EU standard</th>
<th>Glove comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrile rubber</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td>(minimum requirement)</td>
</tr>
<tr>
<td>Neoprene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural rubber</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.
(Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

Respiratory Protection
When workers are facing concentrations above the exposure limit they must use
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly.

**Large scale/emergency use**

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.  
**Recommended Filter type:** Organic gases and vapours filter Type A Brown conforming to EN14387

**Small scale/Laboratory use**

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.  
**Recommended half mask:** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141

When RPE is used a face piece Fit Test should be conducted.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls**

No information available.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Light yellow</td>
</tr>
<tr>
<td><strong>Physical State</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Melting Point/Range</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Softening Point</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Boiling Point/Range</strong></td>
<td>227 °C - 230 °C / 440.6 - 446 °F @ 760 mmHg Method - No information available</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>88 °C / 190.4 °F</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Flammability (solid,gas)</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Explosion Limits</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td>0.4 mmHg @ 20 °C</td>
</tr>
<tr>
<td><strong>Vapor Density</strong></td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Specific Gravity / Density</strong></td>
<td>0.958 (&lt;Air = 1.0&gt;)</td>
</tr>
<tr>
<td><strong>Bulk Density</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Water Solubility</strong></td>
<td>Insoluble</td>
</tr>
<tr>
<td><strong>Solubility in other solvents</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Partition Coefficient (n-octanol/water)</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Autoignition Temperature</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Decomposition Temperature</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Explosive Properties</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Oxidizing Properties</strong></td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Molecular Formula</strong></td>
<td>C10 H14 O</td>
</tr>
<tr>
<td><strong>Molecular Weight</strong></td>
<td>150.22</td>
</tr>
</tbody>
</table>

### SECTION 10: STABILITY AND REACTIVITY

#### 10.1. Reactivity

None known, based on information available

#### 10.2. Chemical stability

Stable under normal conditions
10.3. Possibility of hazardous reactions

Hazardous Polymerization  Hazardous polymerization does not occur.
Hazardous Reactions  No information available.

10.4. Conditions to avoid

Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials


10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information  No acute toxicity information is available for this product
(a) acute toxicity;
Oral  Based on available data, the classification criteria are not met
Dermal  No data available
Inhalation  No data available

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)-Carvone</td>
<td>LD50 = 5400 mg/kg ( Rat )</td>
<td>ECHA Registration</td>
<td></td>
</tr>
</tbody>
</table>

(b) skin corrosion/irritation;  No data available
(c) serious eye damage/irritation;  No data available
(d) respiratory or skin sensitization;
   Respiratory  No data available
   Skin  Category 1
   May cause sensitization by skin contact
(e) germ cell mutagenicity;  No data available
(f) carcinogenicity;  No data available
There are no known carcinogenic chemicals in this product
(g) reproductive toxicity;  No data available
(h) STOT-single exposure;  No data available
(i) STOT-repeated exposure;  No data available
   Target Organs  No information available.
(j) aspiration hazard;  No data available
Other Adverse Effects  The toxicological properties have not been fully investigated.

Symptoms / effects, both acute and delayed  Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting:
Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

SECTION 12: ECOLOGICAL INFORMATION
12.1. Toxicity
Ecotoxicity effects
Contains no substances known to be hazardous to the environment or that are not degradable in waste water treatment plants.

12.2. Persistence and degradability
Persistence
Insoluble in water, May persist, based on information available.

12.3. Bioaccumulative potential
May have some potential to bioaccumulate

12.4. Mobility in soil
Spillage unlikely to penetrate soil The product is insoluble and floats on water The product evaporates slowly Is not likely mobile in the environment due its low water solubility. Spillage unlikely to penetrate soil

12.5. Results of PBT and vPvB assessment
No data available for assessment.

12.6. Other adverse effects
Endocrine Disruptor Information
This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant
This product does not contain any known or suspected substance

Ozone Depletion Potential
This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Waste from Residues / Unused Products
Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging
Dispose of this container to hazardous or special waste collection point.

European Waste Catalogue (EWC)
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Other Information
Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO
Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

ADR
Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

IATA
Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

14.5. Environmental hazards
No hazards identified
14.6. Special precautions for user
No special precautions required

14.7. Transport in bulk according to
Not applicable, packaged goods
Annex II of MARPOL73/78 and the IBC Code

SECTION 15: REGULATORY INFORMATION

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

<table>
<thead>
<tr>
<th>International Inventories</th>
<th>Component</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>PICCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>AICS</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)-Carvone</td>
<td>229-352-5</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

National Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Germany - Water Classification (VwVwS)</th>
<th>Germany - TA-Luft Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)-Carvone</td>
<td>WGK 1</td>
<td></td>
</tr>
</tbody>
</table>

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.
Take note of Dir 94/33/EC on the protection of young people at work
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

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full Text of H-/EUH-Statements Referred to Under Section 3
H317 - May cause an allergic skin reaction

Legend

- CAS - Chemical Abstracts Service
- EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances
- IECSC - Chinese Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- WEL - Workplace Exposure Limit
- ACGIH - American Conference of Governmental Industrial Hygienists
- RPE - Respiratory Protective Equipment
- LC50 - Lethal Concentration 50%
- NOEC - No Observed Effect Concentration
- PBT - Persistent, Bioaccumulative, Toxic
- ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
- IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
- OECD - Organisation for Economic Co-operation and Development
- BCF - Bioconcentration factor
- Key literature references and sources for data
- Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and
SAFETY DATA SHEET

L(-)-Carvone

hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit
and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.

Creation Date 22-Sep-2009
Revision Date 27-Oct-2015
Revision Summary SDS sections updated, 2, 3, 4, 10, 11.

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

Disclaimer
The information provided on this 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 guide for safe handling, use, processing, storage,
transportation, disposal and release and is not to be considered as 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
material or in any process, unless specified in the text.

End of Safety Data Sheet