SECTION 1: Identification

1.1. Identification
Trade name: AromaExtract
Chemical name: Hop, Humulus lupulus, ext
CAS-No.: 8060-28-4

1.2. Recommended use and restrictions on use
Use of the substance/mixture: Manufacturing of food

1.3. Supplier
Manufacturer/Supplier/Importer:
S. S. Steiner, Inc.
655 Madison Avenue
New York, NY 10065 - USA
T +1 212 838 8900

Manufacturer/Supplier/Importer:
Simon H. Steiner, Hopfen, GmbH
Auhofstr. 18
Mainburg, 84048 - Germany
T +49-(0)8751-8605-0 - F +49-(0)8751-8605-80

1.4. Emergency telephone number
Emergency number:
S. S. Steiner, Inc.
Phone: +1 212 838 8900 (Monday – Friday 08.00 – 17.00, Eastern Time Zone)

Simon H. Steiner, Hopfen, GmbH
Tel.: +49-8751-8605-0 (Monday – Friday 08:00 – 17:00, Central European Time)

Steiner Hops Ltd.
Phone: +44 1992 572 331 (Monday – Friday 08.00 – 17.00, Greenwich Mean Time)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture
GHS-US classification
- Flammable liquids: H227 - Combustible liquid
- Acute toxicity (oral): H302 - Harmful if swallowed
- Aspiration hazard: H304 - May be fatal if swallowed and enters airways

Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements
GHS-US labeling
- Hazard pictograms (GHS-US)

- Signal word (GHS-US): Danger
- Hazard statements (GHS-US):
  - H227 - Combustible liquid
  - H302 - Harmful if swallowed
  - H304 - May be fatal if swallowed and enters airways

- Precautionary statements (GHS-US):
  - P210 - Keep away from heat, hot surfaces, sparks, open flames. - No smoking
  - P280 - Wear protective gloves, eye protection
  - P301+P310 - If swallowed: Immediately call a POISON CENTER, a doctor
  - P331 - Do NOT induce vomiting

2.3. Other hazards which do not result in classification
No additional information available
2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type: Multi-constituent
Chemical name: Hop, Humulus lupulus, ext
CAS-No.: 8060-28-4

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>hop oil (Component)</td>
<td>(CAS-No.) 8007-04-3</td>
<td>15-45</td>
<td>Flam. Liq. 3, H226 Asp. Tox. 1, H304</td>
</tr>
<tr>
<td>3,5-dihydroxy-2,6,6-tris(3-methylbuten-2-yl)-4-(3-methyl-1-oxobuty)cyclohexa-2,4-dien-1-one (Component)</td>
<td>(CAS-No.) 488-28-0</td>
<td>&lt;20</td>
<td>Acute Tox. 3 (Oral), H301</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures
Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures
First-aid measures general: In all cases of doubt, or when symptoms persist, seek medical attention.
First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact: Wash skin with plenty of water.
First-aid measures after eye contact: Rinse eyes with water as a precaution.
First-aid measures after ingestion: Call a poison center/doctor/physician if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)
Symptoms/effects after ingestion: Risk of lung edema.

4.3. Immediate medical attention and special treatment, if necessary
Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media
Unsuitable extinguishing media: Strong water jet.

5.2. Specific hazards arising from the chemical
Fire hazard: Flammable liquid and vapor.
Reactivity: Flammable liquid and vapor.

5.3. Special protective equipment and precautions for fire-fighters
Firefighting instructions: Cool closed containers exposed to fire with water spray.
Protection during firefighting: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.
Other information: Do not allow run-off from fire fighting to enter drains or water courses. Disposal must be done according to official regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel
Emergency procedures: Ventilate spillage area. Avoid breathing mist, vapors, spray. No open flames, no sparks, and no smoking.

6.1.2. For emergency responders
Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

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6.2. Environmental precautions
Avoid sub-soil penetration. Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Cover spill with non combustible material, e.g.: sand/earth. Take up mechanically (sweeping, shoveling) and collect in suitable container for disposal. Notify authorities if product enters sewers or public waters.

Other information: Disposal must be done according to official regulations.

6.4. Reference to other sections
Information for safe handling. See section 7. Concerning personal protective equipment to use, see section 8. For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling: Ensure good ventilation of the work station. Avoid breathing mist, vapors, spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment.

Hygiene measures: Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures: Ground/bond container and receiving equipment.
Storage conditions: Store in a well-ventilated place. Keep cool.Keep container tightly closed. Store locked up.
Maximum storage period: ≈ 6 years
Storage temperature: < 50 °F
Information about storage in one common storage facility: Keep away from food, drink and animal feeding stuffs.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available.

8.2. Appropriate engineering controls
Appropriate engineering controls: Ensure good ventilation of the work station.
Environmental exposure controls: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment
Hand protection:
Chemically resistant protective gloves. Choosing the proper glove is a decision that depends not only on the type of material, but also on other quality features, which differ for each manufacturer. Please follow the instructions related to the permeability and the penetration time provided by the manufacturer. Gloves must be replaced after each use and whenever signs of wear or perforation appear.

Eye protection:
Use splash goggles when eye contact due to splashing is possible.

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
Accidental release measures. Filter type: P1.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state: Liquid
Color: brown
Odor: characteristic
Odor threshold: No data available
pH: 7.5 - 8
Melting point: Not applicable
Freezing point: No data available
Boiling point: No data available
Flash point: ≈ 167 °F
Relative evaporation rate (butyl acetate=1): No data available
Flammability (solid, gas): Not applicable
Vapor pressure: No data available
Relative vapor density at 20 °C: No data available
Relative density: No data available
Specific gravity / density: ≈ 1 g/ml (68°F)
Solubility: No data available
Log Pow: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: 35 - 50 mPa.s (122°F)
Explosion limits: No data available
Explosive properties: Product is not explosive.
Oxidizing properties: No data available
9.2. Other information
Other properties: No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity
Flammable liquid and vapor.

10.2. Chemical stability
Stable under normal conditions. To avoid thermal decomposition, do not overheat.

10.3. Possibility of hazardous reactions
No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid
Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials
No additional information available

10.6. Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Oral: Harmful if swallowed.

<table>
<thead>
<tr>
<th>AromaExtract</th>
<th>484 mg/kg body weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
<td>484 mg/kg body weight</td>
</tr>
<tr>
<td>3,5-dihydroxy-2,6,6-tris(3-methylbuten-2-yl)-4-(3-methyl-1-oxobuty)cyclohexa-2,4-dien-1-one (468-28-0)</td>
<td>100 mg/kg body weight</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified (Based on available data, the classification criteria are not met)

pH: 7.5 - 8
Serious eye damage/irritation: Not classified  
(Based on available data, the classification criteria are not met)

Respiratory or skin sensitization: Not classified  
(Based on available data, the classification criteria are not met)

Germ cell mutagenicity: Not classified  
(Based on available data, the classification criteria are not met)

Carcinogenicity: Not classified  
(Based on available data, the classification criteria are not met)

Reproductive toxicity: Not classified  
(Based on available data, the classification criteria are not met)

Specific target organ toxicity – single exposure: Not classified  
(Based on available data, the classification criteria are not met)

Specific target organ toxicity – repeated exposure: Not classified  
(Based on available data, the classification criteria are not met)

Aspiration hazard: May be fatal if swallowed and enters airways.

Symptoms/effects after ingestion: Risk of lung edema.

SECTION 12: Ecological information

12.1. Toxicity  
Ecology - general: Based on available data, the classification criteria are not met.

12.2. Persistence and degradability  
No additional information available

12.3. Bioaccumulative potential  
No additional information available

12.4. Mobility in soil  
No additional information available

12.5. Other adverse effects  
Other adverse effects: No additional information available.

Effect on the global warming: No known effects from this product.

GWPmix comment: No known effects from this product.

SECTION 13: Disposal considerations

13.1. Disposal methods  
Waste treatment methods: Disposal must be done according to official regulations. Do not dispose of with domestic waste.
Do not discharge into drains or the environment.

Additional information: Flammable vapors may accumulate in the container.

SECTION 14: Transport information

Department of Transportation (DOT)  
In accordance with DOT: Not applicable

TDG: Not applicable
AromaExtract
Safety Data Sheet

Transport by sea
Not applicable

Air transport
Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations
All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

AromaExtract
Manufacturing of food

15.2. International regulations

3,5-dihydroxy-2,6,6-tris(3-methylbuten-2-yl)-4-(3-methyl-1-oxobutyl)cyclohexa-2,4-dien-1-one (46828-0)

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.3. US State regulations
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm.

SECTION 16: Other information

Revision date : 09/01/2017
Data sources : Information provided by the manufacturer.
Department issuing data specification sheet : KFT Chemieservice GmbH
                      Im Leuschnerpark, 3 64347 Griesheim
                      Postfach 1451 64345 Griesheim
                      Germany
                      Phone: +49 6155 8981-400       Fax: +49 6155 8981-500
                      Safety Data Sheet Service: +49 6155 8981-522
Contact person : Stefanie Zgorzelski

Full text of H-phrases:

<table>
<thead>
<tr>
<th>H226</th>
<th>Flammable liquid and vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td>H227</td>
<td>Combustible liquid</td>
</tr>
<tr>
<td>H301</td>
<td>Toxic if swallowed</td>
</tr>
<tr>
<td>H302</td>
<td>Harmful if swallowed</td>
</tr>
<tr>
<td>H304</td>
<td>May be fatal if swallowed and enters airways</td>
</tr>
</tbody>
</table>

Abbreviations and acronyms:

<table>
<thead>
<tr>
<th>ATE</th>
<th>Acute Toxicity Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods</td>
</tr>
<tr>
<td>LD50</td>
<td>Median lethal dose</td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
</tbody>
</table>

Indication of changes:

09/01/2017

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.