1 Identification

· Product identifier

· Trade name: Walnut Furanone synthetic

· Product number: 2246

· Application of the substance / the mixture Food flavorings

· Details of the supplier of the safety data sheet

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· Manufacturer/Supplier:
  Advanced Biotech
  10 Taft Road
  Totowa, NJ 07512 USA

· Information department:
  Product Safety Department
  productsafety@adv-bio.com

· Emergency telephone number:
  1(800)535-5053 (Info Trac)
  1(352)323-3500 (International)
  During normal business hours: 1(973)339-6242

2 Hazard(s) identification

· Classification of the substance or mixture
  Flam. Liq. 4 H227 Combustible liquid.

· Label elements Harmful in contact with skin or if inhaled.

· GHS label elements
  Pictograms on label shall be in the shape of a square set at a point and shall include a black hazard symbol on a white background with a red frame sufficiently wide to be clearly visible.
  The product is classified and labeled according to the Globally Harmonized System (GHS).

· Hazard pictograms Not Applicable

· Signal word Warning

· Hazard statements
  H227 Combustible liquid.

· Precautionary statements
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P370+P378 In case of fire: Use for extinction: CO2, powder or water spray.
  P403+P235 Store in a well-ventilated place. Keep cool.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

(Continued on page 2)
Trade name: Walnut Furanone synthetic

3 Composition/information on ingredients

· Description: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:
  - CAS: 57-55-6 Propylene glycol 85.0%
  - CAS: 3658-77-3 4-Hydroxy-2,5-dimethyl-3(2H)-furanone 15.0%

4 First-aid measures

· Description of first aid measures
  - After inhalation: Supply fresh air; consult doctor in case of complaints.
  - After skin contact: Generally the product does not irritate the skin.
  - After eye contact: Rinse opened eye for several minutes under running water.
  - After swallowing: If symptoms persist consult doctor.

· Information for doctor:
  - Most important symptoms and effects, both acute and delayed
    No further relevant information available.
  - Indication of any immediate medical attention and special treatment needed
    No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  - Suitable extinguishing agents:
    CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  - Special hazards arising from the substance or mixture No further relevant information available.
  - Advice for firefighters
  - Protective equipment: No special measures required.

· Additional information
  Cool endangered receptacles with water spray.

(Continued on page 3)
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
- Environmental precautions:
  Dilute with plenty of water.
  Do not allow to enter sewers/surface or ground water.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th>CAS: 57-55-6 Propylene glycol</th>
<th>30 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-2:</td>
<td>CAS: 57-55-6 Propylene glycol</td>
<td>1,300 mg/m³</td>
</tr>
<tr>
<td>PAC-3:</td>
<td>CAS: 57-55-6 Propylene glycol</td>
<td>7,900 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

- Handling:
  - Precautions for safe handling No special precautions are necessary if used correctly.
  - Information about protection against explosions and fires:
    Keep ignition sources away - Do not smoke.
- Conditions for safe storage, including any incompatibilities
- Storage:
  - Requirements to be met by storerooms and receptacles:
    No special requirements.
    Please refer to product specification for product storage requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
- Control parameters
  - Components with limit values that require monitoring at the workplace:
    The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
Trade name: Walnut Furanone synthetic

At this time, the remaining constituent has no known exposure limits.

<table>
<thead>
<tr>
<th>CAS: 57-55-6 Propylene glycol</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEEL Long-term value: 10 mg/m³</td>
</tr>
</tbody>
</table>

**Additional information:** The lists that were valid during the creation were used as a basis.

- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:** Wash hands before breaks and at the end of work.
- **Breathing equipment:** Not required.
- **Protection of hands:**

  ![Protective gloves]

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material should be based on consideration of the penetration times, rates of diffusion and the degradation.

  **Material of gloves**
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

  **Penetration time of glove material**
  The exact break through time has to be determined by the manufacturer of the protective gloves and has to be observed.

  **Eye protection:** Goggles recommended during refilling.

---

**9 Physical and chemical properties**

- **Information on basic physical and chemical properties**
- **General Information**
  - **Appearance:**
    - **Form:** Liquid
    - **Color:** According to product specification
  - **Odor:** According to product specification
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** Undetermined.
  - **Boiling point/Boiling range:** 187 °C (368.6 °F)

- **Flash point:** 93 °C (199.4 °F)

- **Flammability (solid, gaseous):** Not applicable.

- **Ignition temperature:** 371 °C (699.8 °F)

- **Decomposition temperature:** Not determined.
### Trade name: Walnut Furanone synthetic

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto igniting:</td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td>Danger of explosion:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>2.6 Vol %</td>
</tr>
<tr>
<td>Upper</td>
<td>12.6 Vol %</td>
</tr>
<tr>
<td>Vapor pressure at 20 °C (68 °F):</td>
<td>0.1 hPa (0.1 mm Hg)</td>
</tr>
<tr>
<td>Density at 20 °C (68 °F):</td>
<td>1.12 g/cm³ (9.3464 lbs/gal)</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water:</td>
<td>Fully miscible.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Viscosity:</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Solvent content:</td>
<td></td>
</tr>
<tr>
<td>Organic solvents:</td>
<td>85.0 %</td>
</tr>
<tr>
<td>VOC content</td>
<td>85.00 %</td>
</tr>
<tr>
<td>Other information</td>
<td>No further relevant information available.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Viscosity:</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

### 10 Stability and reactivity

- **Reactivity**: No further relevant information available.
- **Chemical stability**:
- **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
- **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **Incompatible materials**: No further relevant information available.
- **Hazardous decomposition products**: No dangerous decomposition products known.

### 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity**:  
  - **LD/LC50 values that are relevant for classification**:  
    - **ATE (Acute Toxicity Estimate)**  
      - Oral LD50 10,720 mg/kg (mouse)  
    - **CAS: 3658-77-3 4-Hydroxy-2,5-dimethyl-3(2H)-furanone**  
      - Oral LD50 2,000 mg/kg (mouse)  
- **Primary irritant effect**:  
  - **on the skin**: No irritant effect.
Safety Data Sheet
acc. to OSHA HCS

Printing date 02/11/2019
Reviewed on 02/08/2019

Trade name: Walnut Furanone synthetic

- on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
  - Carcinogenic categories
    - IARC (International Agency for Research on Cancer)
      None of the ingredients is listed.
    - NTP (National Toxicology Program)
      None of the ingredients is listed.
    - OSHA-Ca (Occupational Safety & Health Administration)
      None of the ingredients is listed.

12 Ecological information
- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
  - Other adverse effects: No further relevant information available.

13 Disposal considerations
- Waste treatment methods
  - Recommendation:
    Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.
  - Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information
- UN-Number
- DOT, ADR, ADN, IMDG, IATA: Not Regulated
- UN proper shipping name
- DOT, ADR, ADN, IMDG, IATA: Not Regulated
Safety Data Sheet
acc. to OSHA HCS

Trade name: Walnut Furanone synthetic

| · Transport hazard class(es) | Not Regulated |
| · DOT, ADR, ADN, IMDG, IATA | Not Regulated |
| · Class | Not applicable. |
| · Packing group | Not applicable. |
| · DOT, ADR, ADN, IMDG, IATA | Not applicable. |
| · Environmental hazards: Marine pollutant: | No |
| · Special precautions for user | Not applicable. |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · Transport/Additional information: | Not dangerous according to the above specifications. |
| · UN "Model Regulation": | Not Regulated |

15 Regulatory information

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

· Sara

· Section 355 (extremely hazardous substances):
None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):
None of the ingredients is listed.

· TSCA (Toxic Substances Control Act):
All ingredients are listed.

· Proposition 65

· Chemicals known to cause cancer:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:
None of the ingredients is listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency)
None of the ingredients is listed.

· TLV (Threshold Limit Value established by ACGIH)
None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients is listed.

(Continued on page 8)
Safety Data Sheet
acc. to OSHA HCS

Trade name: Walnut Furanone synthetic

- **GHS label elements**
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  The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms** Not Applicable
- **Signal word** Warning
- **Hazard statements**
  H227 Combustible liquid.
- **Precautionary statements**
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P370+P378 In case of fire: Use for extinction: CO2, powder or water spray.
  P403+P235 Store in a well-ventilated place. Keep cool.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Chemical safety assessment** A Chemical Safety Assessment has not been carried out.

### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**
  H302 Harmful if swallowed.
  H317 May cause an allergic skin reaction.
  H319 Causes serious eye irritation.

- **Department issuing SDS** Product Safety Department
- **Contact**
  Product Safety Department
  productsafety@adv-bio.com
- **Date of preparation / last revision** 02/11/2019 /
- **Abbreviations and acronyms**
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit
  Flam. Liq. 4: Flammable liquids – Category 4
  Acute Tox. 4: Acute toxicity – Category 4
  Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
  Skin Sens. 1: Skin sensitisation – Category 1