1 Identification

· Product identifier

· Trade name: 2-Methyl-3-Furanthiol 5% WS Natural
· Product number: 1324
· CAS Number: 28588-74-1/57-55-6/56-81-5
· EINECS Number: 249-094-7/200-338-0/200-289-5
· 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

  GHS06 Skull and crossbones

  Acute Tox. 3 H331 Toxic if inhaled.

  GHS05 Corrosion

  Eye Dam. 1 H318 Causes serious eye damage.

  GHS07

  Acute Tox. 4 H302 Harmful if swallowed.

· Label elements

· 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).

(Continued on page 2)
· Hazard pictograms

![GHS05](image1) ![GHS06](image2)

· Signal word Danger

· Hazard-determining components of labeling:
  2-Methyl-3-Furanthiol

· Hazard statements
  H302 Harmful if swallowed.
  H331 Toxic if inhaled.
  H318 Causes serious eye damage.

· Precautionary statements
  P261 Avoid breathing dust/fume/gas/mist/vapors/spray
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P310 Immediately call a poison center/doctor.
  P321 Specific treatment (see on this label).
  P330 Rinse mouth.
  P405 Store locked up.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
  · NFPA ratings (scale 0 - 4)
    ![NFPA_ratings](image3)
    Health = 3
    Fire = 1
    Reactivity = 0
  · HMIS-ratings (scale 0 - 4)
    ![HMIS-ratings](image4)
    HEALTH
    Health = *3
    FIRE
    Fire = 1
    REACTIVITY
    Reactivity = 0

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

3 Composition/information on ingredients

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

· Dangerous components:

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-55-6</td>
<td>Propylene glycol</td>
<td>69.0%</td>
</tr>
<tr>
<td>56-81-5</td>
<td>Glycerol</td>
<td>22.0%</td>
</tr>
<tr>
<td>28588-74-1</td>
<td>2-Methyl-3-Furanthiol</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

- Flam. Liq. 3, H226;
- Acute Tox. 2, H300;
- Acute Tox. 3, H311;
- Acute Tox. 1, H330;
- Eye Dam. 1, H318

(Continued on page 3)
4 First-aid measures

· Description of first aid measures
· General information:
  Immediately remove any clothing soiled by the product.
  Symptoms of poisoning may even occur after several hours; therefore medical observation for at least
  48 hours after the accident.
  Remove breathing apparatus only after contaminated clothing have been completely removed.
  In case of irregular breathing or respiratory arrest provide artificial respiration.
· After inhalation:
  Supply fresh air or oxygen; call for doctor.
  In case of unconsciousness place patient stably in side position for transportation.
· After skin contact:
  Immediately wash with water and soap and rinse thoroughly.
· After eye contact:
  Rinse opened eye for several minutes under running water. Then consult a doctor.
· After swallowing:
  Immediately call a 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, powder or alcohol-resistant foam.
  CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  Use fire fighting measures that suit the environment.
· Special hazards arising from the substance or mixture
  No further relevant information available.
· Advice for firefighters
· Protective equipment: Mouth respiratory protective device.
· Additional information
  Cool endangered receptacles with water spray.
  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: 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).
  Use neutralizing agent.
  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.
Trade name: 2-Methyl-3-Furanthiol 5% WS Natural

### Protective Action Criteria for Chemicals

- **PAC-1:**
  - CAS: 57-55-6 Propylene glycol 30 mg/m³
  - CAS: 56-81-5 Glycerol 45 mg/m³

- **PAC-2:**
  - CAS: 57-55-6 Propylene glycol 1,300 mg/m³
  - CAS: 56-81-5 Glycerol 180 mg/m³

- **PAC-3:**
  - CAS: 57-55-6 Propylene glycol 7,900 mg/m³
  - CAS: 56-81-5 Glycerol 1,100 mg/m³

### 7 Handling and storage

- **Handling:**
  - **Precautions for safe handling:**
    - Ensure good ventilation/exhaustion at the workplace.
    - Open and handle receptacle with care.
    - Prevent formation of aerosols.
  - **Information about protection against explosions and fires:**
    - Keep respirator protective device available.

- **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 constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
  
  At this time, the remaining constituent has no known exposure limits.

  **CAS: 57-55-6 Propylene glycol**
  - WEEL Long-term value: 10 mg/m³

  **CAS: 56-81-5 Glycerol**
  - PEL Long-term value: 15* 5** mg/m³
    - mist; *total dust **respirable fraction
  - TLV TLV withdrawn-insufficient data human occup. exp.

- **Additional information:**
  - The lists that were valid during the creation were used as a basis.
48.1.23 · Exposure controls
  · Personal protective equipment:
    · General protective and hygienic measures:
      Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Store protective clothing separately. Avoid contact with the eyes. Avoid contact with the eyes and skin.
    · Breathing equipment:
      In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
    · 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:
      Tightly sealed goggles

9 Physical and chemical properties
· Information on basic physical and chemical properties
  · General Information
    · Appearance:
      Form: Liquid
      Color: According to product specification
    · Odor:
      Odor threshold: Not determined.
    · pH-value:
      Not determined.
  · Change in condition
    Melting point/Melting range: Undetermined.
### 48.1.23 Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point/Boiling range</td>
<td>Undetermined</td>
</tr>
<tr>
<td>· Flash point</td>
<td>107 °C (224.6 °F)</td>
</tr>
<tr>
<td>· Flammability (solid, gaseous)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>· Ignition temperature</td>
<td>371 °C (699.8 °F)</td>
</tr>
<tr>
<td>· Decomposition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>· Auto igniting</td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td>· Danger of explosion</td>
<td>Product does not present an explosion hazard.</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>1.125 g/cm³ (9.38813 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>Not miscible or difficult to mix.</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>91.0 %</td>
</tr>
<tr>
<td>· VOC content</td>
<td>69.00 %</td>
</tr>
<tr>
<td></td>
<td>776.3 g/l / 6.48 lb/gal</td>
</tr>
<tr>
<td>· Solids content</td>
<td>4.0 %</td>
</tr>
<tr>
<td>· Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

### 10 Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No further relevant information available.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td></td>
</tr>
<tr>
<td>Thermal decomposition / conditions to be avoided</td>
<td>No decomposition if used according to specifications.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>No dangerous reactions known.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>No further relevant information available.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>No further relevant information available.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>No dangerous decomposition products known.</td>
</tr>
</tbody>
</table>
11 Toxicological information

· Information on toxicological effects
· Acute toxicity:

· LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>ATE (Acute Toxicity Estimate)</th>
<th>Oral LD50</th>
<th>2,000 mg/kg (mouse)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalative LC50/4 h</td>
<td>4.2 mg/l  (rat)</td>
<td></td>
</tr>
</tbody>
</table>

CAS: 28588-74-1 2-Methyl-3-Furanthiol

| Oral LD50 | 100 mg/kg (mouse) |
| Dermal LD50 | 300 mg/kg (ATE) |
| Inhalative LC50/4 h | 0.21 mg/l (rat) |

· Primary irritant effect:
· on the skin: No irritant effect.
· on the eye: Strong irritant with the danger of severe eye injury.
· Sensitization: No sensitizing effects known.
· Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations:
Toxic
Harmful
Irritant

· 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.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
· Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
### 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.

### 14 Transport information

- **UN-Number**
  - DOT, ADR, IMDG, IATA UN2810

- **UN proper shipping name**
  - DOT Toxic, liquids, organic, n.o.s. (2-Methyl-3-Furancnhol)
  - ADR 2810 TOXIC LIQUID, ORGANIC, N.O.S. (2-Methyl-3-Furancnhol)
  - IMDG, IATA TOXIC LIQUID, ORGANIC, N.O.S. (2-Methyl-3-Furancnhol)

- **Transport hazard class(es)**
  - DOT, IMDG, IATA
    - **Class** 6.1 Toxic substances
    - **Label** 6.1

- **ADR**
  - **Class** 6.1 (T1) Toxic substances
  - **Label** 6.1

- **Packing group**
  - DOT, ADR, IMDG, IATA III

- **Environmental hazards:**
  - Not applicable.

- **Special precautions for user**
  - **Warning:** Toxic substances
  - **Danger code (Kemler):** 60
  - **EMS Number:** F-A, S-A
  - **Stowage Category** A

(Continued on page 9)
## Trade name: 2-Methyl-3-Furanthiol 5% WS Natural

### 48.1.23 Stowage Code
- SW2 Clear of living quarters.

### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Not applicable.

### Transport/Additional information:

#### DOT
- Quantity limitations
  - On passenger aircraft/rail: 60 L
  - On cargo aircraft only: 220 L

#### ADR
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

#### IMDG
- Limited quantities (LQ)
  - 5L
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

### UN "Model Regulation"
- UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (2-METHYL-3-FURANTHIOL), 6.1, III

### 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.
  - TSCA new (21st Century Act): (Substances not listed)
    - CAS: 28588-74-1 2-Methyl-3-Furanthiol
  - Proposition 65
    - None of the ingredients is listed.
    - 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.
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
  H226 Flammable liquid and vapor.
  H300 Fatal if swallowed.
  H311 Toxic in contact with skin.
  H318 Causes serious eye damage.
  H330 Fatal if inhaled.

· Department issuing SDS: Product Safety Department
Trade name: 2-Methyl-3-Furanthiol 5% WS Natural

- 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. 3: Flammable liquids – Category 3
  Acute Tox. 2: Acute toxicity – Category 2
  Acute Tox. 4: Acute toxicity – Category 4
  Acute Tox. 3: Acute toxicity – Category 3
  Acute Tox. 1: Acute toxicity – Category 1
  Eye Dam. 1: Serious eye damage/eye irritation – Category 1