1 Identification

- Product identifier
  - Trade name: 2-Methyl-2-Pentenoic Acid synthetic
  - Product number: 2017
  - CAS Number: 16957-70-3
  - EC number: 241-026-4

- Application of the substance / the mixture: Food flavorings

- Details of the supplier of the safety data sheet
  DISCLAIMER: The information in this Safety Data Sheet (SDS) is believed to be correct as of the date issued. Advanced Biotech makes NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the Advanced Biotech product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of an Advanced Biotech product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the Advanced Biotech product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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

- Information department:
  Product Safety Department
  productssafty@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
  GHS05 Corrosion

  Skin Corr. 1C  H314 Causes severe skin burns and eye damage.

- 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 substance is classified and labeled according to the Globally Harmonized System (GHS).

- Hazard pictograms
  GHS05

- Signal word: Danger
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

- **Hazard-determining components of labeling:**
  - 2-Methyl-2-pentenoic acid
- **Hazard statements**
  - H314 Causes severe skin burns and eye damage.
- **Precautionary statements**
  - P260 Do not breathe/dust/fume/gas/mist/vapors/spray.
  - P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - 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).
  - P405 Store locked up.
  - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Classification system:**
  - NFPA ratings (scale 0 - 4)
    - Health = 3
    - Fire = 1
    - Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    - Health = 3
    - Fire = 1
    - Reactivity = 0

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

### 3 Composition/information on ingredients

- **Chemical characterization:** Substances
- **CAS No. Description**
  - 16957-70-3 2-Methyl-2-pentenoic acid
- **Identification number(s)**
  - EC number: 241-026-4

### 4 First-aid measures

- **Description of first aid measures**
  - **General information:** Immediately remove any clothing soiled by the product.
  - **After inhalation:** 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:** If symptoms persist consult doctor.
  - **Information for doctor:**
    - **Most important symptoms and effects, both acute and delayed**
      - No further relevant information available.
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

· 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 alcoholresistant 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
  During heating or in case of fire poisonous gases are produced.
· 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
  Mount respiratory protective device.
  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:
  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.
· Protective Action Criteria for Chemicals

  · PAC-1:
    Substance is not listed.

  · PAC-2:
    Substance is not listed.

  · PAC-3:
    Substance is not listed.

7 Handling and storage

· Handling:
· Precautions for safe handling
  Thorough dedusting.
  Ensure good ventilation/exhaustion at the workplace.
· Information about protection against explosions and fires:
  Keep respiratory protective device available.
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

· 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: Not required.
  · Additional information: The lists that were valid during the creation were used as a basis.

· Exposure controls
  · Personal protective equipment:
    · General protective and hygiene measures:
      Keep away from foodstuffs, beverages and feed.
      Immediately remove all soiled and contaminated clothing.
      Wash hands before breaks and at the end of work.
      Avoid contact with the skin.
      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.

· 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.
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid or liquid</td>
</tr>
<tr>
<td>Form</td>
<td>Solid or liquid</td>
</tr>
<tr>
<td>Color</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>26-28 °C (78.8-82.4 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>123-125 °C (253.4-257 °F) (@ 30 mm)</td>
</tr>
<tr>
<td>Flash point</td>
<td>107 °C (224.6 °F)</td>
</tr>
<tr>
<td>Flammability (solid, gaseous)</td>
<td>Product is not flammable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Auto igniting</td>
<td>Not determined</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>Not determined</td>
</tr>
<tr>
<td>Upper</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Density</td>
<td>Not determined</td>
</tr>
<tr>
<td>Relative density</td>
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</tr>
<tr>
<td>Vapor density</td>
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<tr>
<td>Evaporation rate</td>
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<tr>
<td>Solubility in / Miscibility with Water</td>
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</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
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<tr>
<td>Viscosity</td>
<td></td>
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<tr>
<td>Dynamic</td>
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</tr>
<tr>
<td>Kinematic</td>
<td>Not applicable</td>
</tr>
<tr>
<td>VOC content</td>
<td>0.00 %</td>
</tr>
<tr>
<td>Solids content</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

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:
    - Primary irritant effect:
      - on the skin: Irritant to skin and mucous membranes.
      - on the eye: No irritating effect.
      - Sensitization: No sensitizing effects known.
  - Additional toxicological information:
    - Carcinogenic categories
      - IARC (International Agency for Research on Cancer) Substance is not listed.
      - NTP (National Toxicology Program) Substance is not listed.
      - OSHA-Ca (Occupational Safety & Health Administration) Substance is not 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 2 (Assessment by list): hazardous for water
    - Do not allow product to reach ground water, water course or sewage system.
    - Must not reach bodies of water or drainage ditch undiluted or unneutralized.
    - Danger to drinking water if even small quantities leak into the ground.
- 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  UN3261

· UN proper shipping name
  DOT
  ADR  3261 CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.
  IMDG, IATA  CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.

· Transport hazard class(es)
  DOT, IMDG, IATA

  Class  8 Corrosive substances
  Label  8

  ADR

  Class  8 Corrosive substances

· Packing group
  DOT, ADR, IMDG, IATA  III

· Environmental hazards:
  Marine pollutant:  No

· Special precautions for user
  Warning: Corrosive substances

· Stowage Category
  A

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

(Continued on page 8)
Trade name: 2-Methyl-2-Pentenoic Acid synthetic

- Transport/Additional information:
  - DOT
  - Quantity limitations
    On passenger aircraft/rail: 25 kg
    On cargo aircraft only: 100 kg

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

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

- UN "Model Regulation":
  UN 3261 CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S., 8, III

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Section 355 (extremely hazardous substances):
    Substance is not listed.
  - Section 313 (Specific toxic chemical listings):
    Substance is not listed.
  - TSCA (Toxic Substances Control Act):
    Substance is listed.

- TSCA new (21st Century Act): (Substances not listed)
  - CAS: 16957-70-3 2-Methyl-2-pentenoic acid

- Proposition 65

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    Substance is not listed.
  - TLV (Threshold Limit Value established by ACGIH)
    Substance is not listed.
Safety Data Sheet
acc. to OSHA HCS

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

Trade name: 2-Methyl-2-Pentenoic Acid synthetic

· NIOSH-Ca (National Institute for Occupational Safety and Health)
Substance is not listed.

· 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 substance is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms
  ![GHS05](image)

· Signal word Danger

· Hazard-determining components of labeling:
  2-Methyl-2-pentenoic acid

· Hazard statements
  H314 Causes severe skin burns and eye damage.

· Precautionary statements
  P260 Do not breathe/dust/fume/gas/mist/vapors/spray.
  P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  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).
  P405 Store locked up.
  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.

· 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
  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)
  PBT: Persistent, Bioaccumulative and Toxic

(Continued on page 10)
### Trade name: 2-Methyl-2-Pentenoic Acid synthetic

<table>
<thead>
<tr>
<th>术语</th>
<th>定义</th>
</tr>
</thead>
<tbody>
<tr>
<td>vPvB</td>
<td>非常持久和非常生物累积性</td>
</tr>
<tr>
<td>NIOSH</td>
<td>国家职业安全卫生研究所</td>
</tr>
<tr>
<td>OSHA</td>
<td>职业安全与健康管理局</td>
</tr>
<tr>
<td>TLV</td>
<td>阈限值（接尘浓度）</td>
</tr>
<tr>
<td>PEL</td>
<td>允许暴露限值</td>
</tr>
<tr>
<td>REL</td>
<td>推荐暴露限值</td>
</tr>
<tr>
<td>Skin Corr. 1C</td>
<td>皮肤腐蚀/刺激 - 第1C类</td>
</tr>
</tbody>
</table>

(Continuation of page 9)