1 Identification

- Product identifier
  - Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic
  - Product number: 4010
  - CAS Number: 1124-11-4
  - EC number: 214-391-2
- Application of the substance / the mixture: Food flavorings

2 Hazard(s) identification

- Classification of the substance or mixture
  - 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 substance is classified and labeled according to the Globally Harmonized System (GHS).
  - Hazard pictograms
    - GHS07

- Signal word: Warning
Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic

- Hazard-determining components of labeling:
  2,3,5,6-tetramethylpyrazine
- Hazard statements
  H302 Harmful if swallowed.
- Precautionary statements
  P264 Wash thoroughly after handling.
  P270 Do not eat, drink or smoke when using this product.
  P301+P312 If swallowed: Call a poison center/doctor if you feel unwell.
  P330 Rinse mouth.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- Classification system:
  - NFPA ratings (scale 0 - 4)
    Health = 1
    Fire = 1
    Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    HEALTH Health = 1
    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
- Chemical characterization: Substances
- CAS No. Description
  1124-11-4 2,3,5,6-tetramethylpyrazine
- Identification number(s)
  - EC number: 214-391-2

4 First-aid measures
- Description of first aid measures
- General information:
  Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- 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: Immediately call a doctor.
- Information for doctor:
  - Most important symptoms and effects, both acute and delayed
    No further relevant information available.
Trade name: 2,3,5,6-Tetramethyl Pyrazine 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 No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.
- 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 Not required.
- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:
  Dispose contaminated material as waste according to item 13.
- 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 No special precautions are necessary if used correctly.
  Information about protection against explosions and fires: No special measures required.
- 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: None.

(Continued on page 4)
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 hygienic measures:
    Keep away from foodstuffs, beverages and feed.
    Wash hands before breaks and at the end of work.
  - Breathing equipment: Not required.
  - Protection of hands: 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.
  - Eye protection: Not required.

9 Physical and chemical properties

- Information on basic physical and chemical properties
  - General Information
  - Appearance:
    Form: Solid
    Color: According to product specification
    Odor: According to product specification
    Odor threshold: Not determined.
  - pH-value: Not applicable.
  - Change in condition
    Melting point/Melting range: 83-87 °C (181.4-188.6 °F)
    Boiling point/Boiling range: Undetermined.
  - Flash point: >110 °C (>230 °F)
  - Flammability (solid, gaseous): Product is not flammable.
  - Decomposition temperature: Not determined.
  - Auto igniting: Not determined.
Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic

(Continuation of page 4)

- **Danger of explosion:** Product does not present an explosion hazard.
  - **Explosion limits:**
    - **Lower:** Not determined.
    - **Upper:** Not determined.
  - **Vapor pressure:** Not applicable.
  - **Density:** Not determined.
  - **Relative density**
  - **Vapor density**
  - **Evaporation rate**
  - **Solubility in / Miscibility with Water:** Insoluble.
  - **Partition coefficient (n-octanol/water):** Not determined.
  - **Viscosity:**
    - **Dynamic:** Not applicable.
    - **Kinematic:** Not applicable.
  - **VOC content:** 0.00 %
  - **Solids content:** 100.0 %
  - **Other information** No further relevant information available.

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 1,910 mg/kg (rat)
      - CAS: 1124-11-4 2,3,5,6-tetramethylpyrazine
        - Oral LD50 1,910 mg/kg (rat)
    - **Primary irritant effect:**
      - on the skin: No irritant effect.
      - on the eye: No irritating effect.
    - **Sensitization:** No sensitizing effects known.
Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic

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.

14 Transport information

- UN-Number
  - DOT, ADR, ADN, IMDG, IATA: Not Regulated
- UN proper shipping name
  - DOT, ADR, ADN, IMDG, IATA: Not Regulated
Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic

<table>
<thead>
<tr>
<th>Subject</th>
<th>Information</th>
</tr>
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<tbody>
<tr>
<td>Transport hazard class(es)</td>
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</tr>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
<td>Class: Not Regulated</td>
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<tr>
<td>Packing group</td>
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<tr>
<td>DOT, ADR, IMDG, IATA</td>
<td>Environmental hazards:</td>
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<tr>
<td>Marine pollutant:</td>
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<tr>
<td>Special precautions for user</td>
<td>Not applicable.</td>
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<tr>
<td>Transport in bulk according to Annex II of</td>
<td>Not applicable.</td>
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<tr>
<td>MARPOL73/78 and the IBC Code</td>
<td>Transport/Additional information:</td>
</tr>
<tr>
<td></td>
<td>Not dangerous according to the</td>
</tr>
<tr>
<td></td>
<td>above specifications.</td>
</tr>
<tr>
<td>UN &quot;Model Regulation&quot;:</td>
<td>Not Regulated</td>
</tr>
</tbody>
</table>

15 Regulatory information

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

- 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: 1124-11-4 2,3,5,6-tetramethylpyrazine

- Proposition 65
  - Chemicals known to cause cancer:
    Substance is not listed.
  - Chemicals known to cause reproductive toxicity for females:
    Substance is not listed.
  - Chemicals known to cause reproductive toxicity for males:
    Substance is not listed.
  - Chemicals known to cause developmental toxicity:
    Substance is not listed.

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    Substance is not listed.

- TLV (Threshold Limit Value established by ACGIH)
  Substance is not listed.
· **Safety Data Sheet**

**Trade name:** 2,3,5,6-Tetramethyl Pyrazine synthetic

**OSHA HCS**

**Printing date 02/11/2019**

**Reviewed on 02/08/2019**

| · NIOSH-Ca (National Institute for Occupational Safety and Health) |
| Substances 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**
  
  GHS07

· **Signal word** Warning

· **Hazard-determining components of labeling:**
  
  2,3,5,6-tetramethylpyrazine

· **Hazard statements**
  
  H302 Harmful if swallowed.

· **Precautionary statements**
  
  P264 Wash thoroughly after handling.
  P270 Do not eat, drink or smoke when using this product.
  P301+P312 If swallowed: Call a poison center/doctor if you feel unwell.
  P330 Rinse mouth.
  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)
  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

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Trade name: 2,3,5,6-Tetramethyl Pyrazine synthetic

TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Acute Tox. 4: Acute toxicity – Category 4