1 Identification

- Product identifier
  - Trade name: Epalrestat
  - Article number: 15214
  - CAS Number: 82159-09-9
  - EC number: 675-018-0
  - Application of the substance / the mixture
    This product is for research use - Not for human or veterinary diagnostic or therapeutic use.

- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier: Cayman Chemical Co.
    1180 E. Ellsworth Rd.
    Ann Arbor, MI 48108
    USA

  - Information department: Product safety department
  - Emergency telephone number:
    During normal opening times: +1 (734) 971-3335
    US/CANADA: 800-424-9300
    Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- Classification of the substance or mixture
  - GHS06 Skull and crossbones
  - Acute Toxicity - Oral 2 H300 Fatal if swallowed.

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

- Hazard pictograms
  - GHS06

- Signal word Danger

(Contd. on page 2)
56.1.0

· Hazard statements
  H300 Fatal if swallowed.

· Precautionary statements
  P264 Wash thoroughly after handling.
  P270 Do not eat, drink or smoke when using this product.
  P301+P310 If swallowed: 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)
    Health = 0
    Fire = 0
    Reactivity = 0
  · HMIS-ratings (scale 0 - 4)
    HEALTH 1 Health = 1
    FIRE 0 Fire = 0
    REACTIVITY 0 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
    82159-09-9 Epalrestat
  · Identification number(s)
    · EC number: 675-018-0

4 First-aid measures

· Description of first aid measures
  · General information:
    Immediately remove any clothing soiled by the product.
    In case of irregular breathing or respiratory arrest provide artificial respiration.
  · 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: Do not induce vomiting; immediately call for medical help.
  · Information for doctor:
    · Most important symptoms and effects, both acute and delayed
      No further relevant information available.
5 Fire-fighting measures

- Extinguishing media
  - Suitable extinguishing agents:
    Use fire fighting measures that suit the environment.
    A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture: No further relevant information available.
- Advice for firefighters
  - Protective equipment: No special measures required.

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 section 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: Thorough dedusting.
- Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
  Keep container tightly closed.
  Store in accordance with information listed on the product insert.
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- 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 section 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 basis.
## 9 Physical and chemical properties

### Information on basic physical and chemical properties

#### General Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Crystalline</td>
</tr>
<tr>
<td>Color</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Structural Formula</td>
<td>C15H13NO3S2</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>319.4 g/mol</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined.</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

#### Change in condition

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Undetermined.</td>
</tr>
</tbody>
</table>

#### Flash point

- Not applicable.

#### Flammability (solid, gaseous)

- Product is not flammable.

#### Decomposition temperature

- Not determined.

#### Ignition temperature

- Not determined.

#### 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.
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: strong oxidizing agents
- Hazardous decomposition products: carbon oxides, nitrogen oxides, sulfur oxides

11 Toxicological information

- RTECS Number XJ5131855
- Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>Route</th>
<th>LD50/LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>3,200 mg/kg (mouse)</td>
</tr>
<tr>
<td>Oral LD50</td>
<td>5,300 µg/kg (rat)</td>
</tr>
<tr>
<td>Intraperitoneal LD50</td>
<td>687 mg/kg (mouse)</td>
</tr>
<tr>
<td>Intraperitoneal LD50</td>
<td>922 g/kg (rat)</td>
</tr>
<tr>
<td>Subcutaneous LD50</td>
<td>&gt;3 g/kg (rat)</td>
</tr>
</tbody>
</table>

- Primary irritant effect:
  - on the skin: No irritant effect.
  - 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 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, IMDG, IATA | UN3288 |
| · UN proper shipping name | DOT, IATA | Toxic solid, inorganic, n.o.s. (Epalrestat) |
| · IMDG | TOXIC SOLID, INORGANIC, N.O.S. (Epalrestat) |
| · Transport hazard class(es) | DOT |
| · Class | 6.1 Toxic substances |
| · Label | 6.1 |
Trade name: Epalrestat

- **IMDG, IATA**

  - Class: 6.1 Toxic substances
  - Label: 6.1

- **Packing group**
  - DOT, IMDG, IATA: I

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

- **Special precautions for user**
  - Warning: Toxic substances
  - Hazard identification number (Kemler code): 66
  - EMS Number: F-A,S-A
  - Stowage Category: B

- **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: 5 kg
  - On cargo aircraft only: 50 kg

  - IMDG
  - Limited quantities (LQ): 0
  - Excepted quantities (EQ): Code: E5
    - Maximum net quantity per inner packaging: 1 g
    - Maximum net quantity per outer packaging: 300 g

  - IATA
  - Remarks: When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

- **UN "Model Regulation":**
  - UN 3288 TOXIC SOLID, INORGANIC, N.O.S. (EPALRESTAT), 6.1, I

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**15 Regulatory information**

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - No further relevant information available.

  - 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 not listed.
  - Hazardous Air Pollutants Substance is not listed.
  - Proposition 65
  - Chemicals known to cause cancer: Substance is not listed.


Trade name: Epalrestat

(Contd. from page 7)

- **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)** Substance is not listed.
  - **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
  - **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- **Department issuing SDS:** Environment protection department.
- **Contact:** -
- **Date of preparation / last revision** 05/19/2023
- **Abbreviations and acronyms:**
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - 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)
  - 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
  - Acute Toxicity - Oral 2: Acute toxicity – Category 2
- * Data compared to the previous version altered.