SAFETY DATA SHEET
according to GB/T 16483 and GB/T 17519

Imipenem / Cilastatin / Relebactam Formula-
tion

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Imipenem / Cilastatin / Relebactam Formulation

Manufacturer or supplier's details
Company : MSD
Address : 199 Wenhai North Road
HEDA, Hangzhou - Zhejiang Province - CHINA 310018
Telephone : 908-740-4000
Emergency telephone number : 86-571-87268110
E-mail address : EHSDATASTEWARD@msd.com

Recommended use of the chemical and restrictions on use
Recommended use : Pharmaceutical

2. HAZARDS IDENTIFICATION

Emergency Overview

| Appearance | powder |
| Colour | No data available |
| Odour | No data available |

Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.

GHS Classification

<table>
<thead>
<tr>
<th>Hazard Class + Subclass</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Respiratory sensitisation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ toxicity - repeated exposure</td>
<td>Category 2</td>
</tr>
<tr>
<td>Short-term (acute) aquatic hazard</td>
<td>Category 1</td>
</tr>
<tr>
<td>Long-term (chronic) aquatic hazard</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

GHS label elements
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Date of first issue: 2015/02/27

Hazard pictograms:

Signal word: Danger

Hazard statements:
H319 Causes serious eye irritation.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284 Wear respiratory protection.

Response:
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P391 Collect spillage.

Storage:
P405 Store locked up.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Physical and chemical hazards
Not classified based on available information.

Health hazards
Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure.
3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imipenem</td>
<td>74431-23-5</td>
<td>&gt;= 30 -&lt; 50</td>
</tr>
<tr>
<td>Relebactam</td>
<td>1174020-13-3</td>
<td>&gt;= 10 -&lt; 20</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

If swallowed : If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reac-
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Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

Notes to physician : Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire-
fighting : Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Exposure to combustion products may be a hazard to health.

Specific extinguishing meth-
ods : Use extinguishing measures that are appropriate to local circum-stances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec-
tive equipment and emer-
gency procedures : Use personal protective equipment.
Follow safe handling advice and personal protective equip-
ment recommendations.

Environmental precautions : Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for con-
tainment and cleaning up : Sweep up or vacuum up spillage and collect in suitable con-
tainer for disposal.
Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).
Dust deposits should not be allowed to accumulate on surfac-
es, as these may form an explosive mixture if they are re-
leased into the atmosphere in sufficient concentration.
Local or national regulations may apply to releases and dis-
7. HANDLING AND STORAGE

Handling

Technical measures: Static electricity may accumulate and ignite suspended dust causing an explosion. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Local/Total ventilation: Use only with adequate ventilation.

Advice on safe handling: Do not breathe dust. Do not swallow. Do not get in eyes. Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Keep container tightly closed. Already sensitised individuals should consult their physician regarding working with respiratory irritants or sensitisers. Minimize dust generation and accumulation. Keep container closed when not in use. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment.

Avoidance of contact: Oxidizing agents

Storage

Conditions for safe storage: Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.

Materials to avoid: Do not store with the following product types: Strong oxidizing agents

Packaging material: Unsuitable material: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydrogen [R-[R*,S*-(Z)]]-7-[(2-amino-2-</td>
<td>81129-83-1</td>
<td>TWA</td>
<td>5 mg/m3 (OEB 1)</td>
<td>Internal</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>TWA</th>
<th>Exposure Level</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imipenem</td>
<td>74431-23-5</td>
<td>1000 ug/m³ (OEB 1)</td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>Relebactam</td>
<td>1174020-13-3</td>
<td>0.3 mg/m³ (OEB 2)</td>
<td>Internal</td>
<td></td>
</tr>
</tbody>
</table>

Further information: RSEN

Engineering measures:
Use feasible engineering controls to minimize exposure to compound.
All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.

Personal protective equipment:

Respiratory protection:
Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type:
Particulates type

Eye/face protection:
Wear safety glasses with side shields or goggles.
If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Skin and body protection:
Work uniform or laboratory coat.

Hand protection:
Material: Chemical-resistant gloves

Hygiene measures:
Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: powder
Colour: No data available
Odour: No data available
Odour Threshold: No data available
pH: No data available
Melting point/freezing point: No data available
### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>Not classified as a reactivity hazard.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Possibility of hazardous reac-</td>
<td>May form explosive dust-air mixture during processing, handling or other means.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Flash point:** No data available

**Evaporation rate:** No data available

**Flammability (solid, gas):** May form explosive dust-air mixture during processing, handling or other means.

**Flammability (liquids):** No data available

**Upper explosion limit / Upper flammability limit:** No data available

**Lower explosion limit / Lower flammability limit:** No data available

**Vapour pressure:** No data available

**Relative vapour density:** No data available

**Relative density:** No data available

**Density:** No data available

**Solubility(ies):**
- **Water solubility:** No data available

**Partition coefficient: n-octanol/water:** No data available

**Auto-ignition temperature:** No data available

**Decomposition temperature:** No data available

**Viscosity:**
- **Viscosity, dynamic:** No data available
- **Viscosity, kinematic:** No data available

**Explosive properties:** Not explosive

**Oxidizing properties:** The substance or mixture is not classified as oxidizing.

**Molecular weight:** No data available

**Particle size:** No data available
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tion

Conditions to avoid: Heat, flames and sparks.
Avoid dust formation.

Incompatible materials: Oxidizing agents

Hazardous decomposition products: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Exposure routes: Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity
Not classified based on available information.

Components:

Sodium hydrogen \([R\*,-S\*- (Z)]\)-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:
Acute oral toxicity: LD50 (Rat): > 10,000 mg/kg
LD50 (Mouse): > 10,000 mg/kg

Imipenem:
Acute oral toxicity: LD50 (Mouse): 10,000 mg/kg

Acute toxicity (other routes of administration): LD50 (Rat): > 2,000 mg/kg
Application Route: Intravenous
LD50 (Mouse): 1,500 mg/kg
Application Route: Intravenous

Skin corrosion/irritation
Not classified based on available information.

Components:

Sodium hydrogen \([R\*,-S\*- (Z)]\)-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:
Species: Rabbit
Result: No skin irritation

Relebactam:
Method: EpiDerm
Result: No skin irritation
Serious eye damage/eye irritation
Causes serious eye irritation.

**Components:**

Sodium hydrogen \([R^*[S^*-(Z)]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:

- **Species:** Rabbit
- **Result:** Moderate eye irritation

**Relebactam:**
- **Result:** No eye irritation
- **Method:** Bovine cornea (BCOP)

Respiratory or skin sensitisation

**Skin sensitisation**
Not classified based on available information.

**Respiratory sensitisation**
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Components:**

Sodium hydrogen \([R^*[S^*-(Z)]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:

- **Exposure routes:** Skin contact
- **Remarks:** No data available

- **Remarks:** Inhalation
- **Remarks:** No data available

**Imipenem:**
- **Remarks:** May cause sensitisation of susceptible persons by inhalation of aerosol or dust.

- **Exposure routes:** Skin contact
- **Remarks:** Not classified due to lack of data.

**Relebactam:**
- **Test Type:** Local lymph node assay (LLNA)

- **Exposure routes:** Dermal
- **Result:** Not a skin sensitizer.

**Germ cell mutagenicity**
Not classified based on available information.

**Components:**

Sodium hydrogen \([R^*[S^*-(Z)]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:
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Genotoxicity in vitro: Test Type: Microbial mutagenesis assay (Ames test) Result: negative

Imipenem:
Genotoxicity in vitro:
Test system: Chinese hamster lung cells
Result: negative

Test Type: reverse mutation assay
Result: negative

Test Type: unscheduled DNA synthesis assay
Result: negative

Test Type: Chromosomal aberration
Result: negative

Test Type: sister chromatid exchange assay
Result: negative

Genotoxicity in vivo:
Test Type: In vivo micronucleus test
Species: Mouse
Application Route: Intravenous
Result: negative

Relebactam:
Genotoxicity in vitro:
Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo:
Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Intraperitoneal injection
Result: negative

Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity:
Not classified based on available information.

Reproductive toxicity:
Suspected of damaging the unborn child.

Components:
Sodium hydrogen [R-[R\(^*\),S\(^*\)-(Z)]]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:
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</tr>
</tbody>
</table>

#### Effects on fertility

**Test Type:** Fertility/early embryonic development  
**Application Route:** Intravenous  
**Fertility:** LOAEL: 1,000  
**Symptoms:** No adverse effects  
**Result:** No effects on fertility and early embryonic development were detected.

---

#### Imipenem:

**Effects on fertility**

**Test Type:** Fertility/early embryonic development  
**Species:** Rat, male and female  
**Application Route:** Intravenous  
**Fertility:** LOAEL: 80 mg/kg body weight  
**Symptoms:** No adverse effects, Reduced foetal weight  
**Result:** No effects on fertility and early embryonic development were detected.

**Test Type:** Fertility/early embryonic development  
**Species:** Rat, male and female  
**Application Route:** Subcutaneous  
**Fertility:** LOAEL: 320 mg/kg body weight  
**Symptoms:** No adverse effects, Reduced foetal weight  
**Result:** No effects on fertility and early embryonic development were detected.

---

#### Effects on foetal development

**Test Type:** Development  
**Species:** Monkey  
**Application Route:** Intravenous  
**Developmental Toxicity:** LOAEL: 100 mg/kg body weight  
**Result:** Embryotoxic effects and adverse effects on the offspring were detected., No teratogenic effects

**Test Type:** Development  
**Species:** Rabbit  
**Application Route:** Intravenous  
**Developmental Toxicity:** NOAEL: 60 mg/kg body weight  
**Result:** No teratogenic effects

**Test Type:** Development  
**Species:** Rat  
**Application Route:** Intravenous  
**Developmental Toxicity:** NOAEL: 60 mg/kg body weight  
**Result:** No teratogenic effects

---

#### Reproductive toxicity - Assessment

**Test Type:** Development  
**Species:** Monkey  
**Application Route:** Intravenous  
**Developmental Toxicity:** LOAEL: 100 mg/kg body weight  
**Result:** Embryotoxic effects and adverse effects on the offspring were detected., No teratogenic effects

---

#### Relebactam:

**Effects on fertility**

**Test Type:** Pre-/postnatal development  
**Species:** Rat  
**Application Route:** Subcutaneous  
**Fertility:** NOAEL: 450 mg/kg body weight
Effects on foetal development:

- **Test Type:** Embryo-foetal development
- **Species:** Rat
- **Application Route:** Intraperitoneal injection
- **Embryo-foetal toxicity:** NOAEL: 450 mg/kg body weight
- **Result:** No effects on foetal development

- **Test Type:** Embryo-foetal development
- **Species:** Mouse
- **Application Route:** Intraperitoneal injection
- **Embryo-foetal toxicity:** NOAEL: 450 mg/kg body weight
- **Result:** No effects on foetal development

- **Test Type:** Development
- **Species:** Rat
- **Application Route:** Intravenous
- **Developmental Toxicity:** NOAEL: >= 450 mg/kg body weight
- **Result:** No effects on fertility and early embryonic development were detected.

- **Test Type:** Development
- **Species:** Rabbit
- **Application Route:** Intravenous
- **Developmental Toxicity:** NOAEL: 450 mg/kg body weight
- **Result:** No effects on foetal development

**STOT - single exposure**
Not classified based on available information.

**STOT - repeated exposure**
May cause damage to organs through prolonged or repeated exposure.

**Components:**

**Relebactam:**
- **Target Organs:** Kidney
- **Assessment:** May cause damage to organs through prolonged or repeated exposure.

**Repeated dose toxicity**

**Components:**

**Sodium hydrogen [R-[R*,S*-(Z)]]-7-[(2-amino-2-carboxyloatoethyl)thio]-2-[[2,2-dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:**
- **Species:** Rat
- **NOAEL:** >= 500 mg/kg
- **Application Route:** Intravenous
- **Exposure time:** 90 Days
- **Remarks:** No significant adverse effects were reported

- **Species:** Monkey
NOAEL: $\geq 500$ mg/kg
Application Route: Intravenous
Exposure time: 5 Weeks
Remarks: No significant adverse effects were reported

**Imipenem:**

Species: Monkey
NOAEL: 60 mg/kg
LOAEL: 150 mg/kg
Application Route: Intravenous
Exposure time: 6 Months
Target Organs: Kidney

Species: Monkey
NOAEL: 120 mg/kg
Application Route: Subcutaneous
Exposure time: 6 Months
Remarks: No significant adverse effects were reported

Species: Rat
NOAEL: 180 mg/kg
Application Route: Intravenous
Exposure time: 6 Months
Remarks: No significant adverse effects were reported

Species: Rabbit
LOAEL: 150 mg/kg
Application Route: Intravenous
Target Organs: Kidney

**Relebactam:**

Species: Rat, female
NOAEL: 150 mg/kg
Application Route: Intravenous
Exposure time: 30 d

Species: Rat, male
NOAEL: 450 mg/kg
Application Route: Intravenous
Exposure time: 30 d

Species: Monkey
NOAEL: 25 mg/kg
Application Route: Intravenous
Exposure time: 30 d
Target Organs: Kidney

Species: Monkey
NOAEL: 37.5 mg/kg
Application Route: Intravenous
Exposure time: 30 d
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Species: Monkey
NOAEL: 50 mg/kg
LOAEL: 150 mg/kg
Application Route: Intravenous
Exposure time: 3 Months
Target Organs: Kidney

Aspiration toxicity
Not classified based on available information.

Experience with human exposure

Components:

Imipenem:
Inhalation: Symptoms: Nausea, Vomiting, Diarrhoea, Fever, hypotension, Dizziness, Drowsiness, Convulsions, pruritis, Rash
Remarks: May cause sensitisation of susceptible persons by inhalation of aerosol or dust.

Relebactam:
Skin contact: Symptoms: Pain, Discomfort, Diarrhoea, Abdominal pain, insomnia, Nausea, sore throat, Vertigo

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Sodium hydrogen [R-[R*,S*-(Z)]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2-
dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): > 111 mg/l
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 99 mg/l
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: EC50 (Anabaena flos-aquae): > 99 mg/l
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (green algae)): > 99 mg/l
Method: OECD Test Guideline 201

NOEC (Anabaena flos-aquae): 99 mg/l
Method: OECD Test Guideline 201
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Toxicity to microorganisms: EC50: > 1,000 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Method: OECD Test Guideline 209

**Imipenem:**

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 78 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants: EC50 (Anabaena flos-aquae (cyanobacterium)): 0.0058 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Anabaena flos-aquae (cyanobacterium)): 0.0025 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (green algae)): > 74 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 74 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity): 100

M-Factor (Chronic aquatic toxicity): 10

**Relebactam:**

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

EC50 (Americamysis): > 100 mg/l
Exposure time: 96 h

Toxicity to algae/aquatic: EC50 (Pseudokirchneriella subcapitata (green algae)): 86 mg/l

NOEC (Pseudokirchneriella subcapitata (green algae)): 99 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Exposure time: 72 h
Method: OECD Test Guideline 201
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</tr>
</tbody>
</table>

**plants**

- **Exposure time**: 72 h
- **Method**: OECD Test Guideline 201

**NOEC** (Pseudokirchneriella subcapitata (green algae)): 12 mg/l
- **Exposure time**: 72 h
- **Method**: OECD Test Guideline 201

**EC50** (Anabaena flos-aquae (cyanobacterium)): > 11 mg/l
- **Exposure time**: 72 h
- **Method**: OECD Test Guideline 201

**NOEC** (Anabaena flos-aquae (cyanobacterium)): 11 mg/l
- **Exposure time**: 72 h
- **Method**: OECD Test Guideline 201

**Toxicity to fish (Chronic toxicity)**

- **NOEC** (Pimephales promelas (fathead minnow)): 9.2 mg/l
- **Exposure time**: 32 d
- **Method**: OECD Test Guideline 210

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

- **NOEC** (Daphnia magna (Water flea)): 2.7 mg/l
- **Exposure time**: 21 d
- **Method**: OECD Test Guideline 211

**Toxicity to microorganisms**

- **EC50**: > 1,000 mg/l
- **Exposure time**: 3 h
- **Test Type**: Respiration inhibition
- **Method**: OECD Test Guideline 209

- **NOEC**: 96.3 mg/l
- **Exposure time**: 3 h
- **Test Type**: Respiration inhibition
- **Method**: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**Sodium hydrogen [R-[R*,S*-(Z)]]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[(2,2-dimethylcyclopropyl)carbonyl]amino]hept-2-enoate:**

- **Biodegradability**: Result: rapidly degradable
  - Biodegradation: 96 %
  - Exposure time: 23 hrs

  Result: Not readily biodegradable.
  - Biodegradation: 27 %
  - Exposure time: 28 d
  - **Method**: OECD Test Guideline 301B

**Imipenem:**

- **Biodegradability**: Result: Not readily biodegradable.
  - Biodegradation: 29 %
Imipenem / Cilastatin / Relebactam Formula- 
tion

Exposure time: 28 d  
Method: OECD Test Guideline 301B

Relebactam:
Biodegradability: Result: Not readily biodegradable.  
Biodegradation: 11.3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 314

Bioaccumulative potential

Components:

Sodium hydrogen [R-[R*,S*-(Z)]]-7-[(2-amino-2-carboxylatoethyl)thio]-2-[[2,2- 
dimethylcyclopropyl]carbonyl]amino]hept-2-enoate:
Partition coefficient: n-octanol/water: log Pow: -3.53

Imipenem:
Partition coefficient: n-octanol/water: log Pow: < -1

Relebactam:
Partition coefficient: n-octanol/water: log Pow: < -2

Mobility in soil

Components:

Relebactam:
Distribution among environmental compartments: log Koc: 2.3

Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues: Dispose of in accordance with local regulations.  
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 3077  
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
### SAFETY DATA SHEET

** according to GB/T 16483 and GB/T 17519

### Imipenem / Cilastatin / Relebactam Formula-
tion

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<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
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<th>(Imipenem)</th>
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<td>Class</td>
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<tr>
<td>Packing group</td>
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<td>Labels</td>
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**IATA-DGR**

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<td>Class</td>
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**IMDG-Code**

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</tr>
<tr>
<td>Class</td>
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<tr>
<td>Packing group</td>
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<td>EmS Code</td>
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<td>Marine pollutant</td>
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**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations**

**GB 6944/12268**

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<th>UN number</th>
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<tbody>
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**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

### 15. REGULATORY INFORMATION

**National regulatory information**

**Law on the Prevention and Control of Occupational Diseases**
## 16. OTHER INFORMATION

### Further information


Date format: yyyy/mm/dd

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxican; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System
Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.