SAFETY DATA SHEET
Streptomycin Sulfate

Section 1. Identification

GHS product identifier : Streptomycin Sulfate
Code : 21865
Other means of identification : D-Streptamine, O-2-deoxy-2-(methylamino)-\(\alpha\)-L-glucopyranosyl-(1\(\rightarrow\)2)-O-5-deoxy-3-C-formyl-\(\alpha\)-L-lyxofuranosyl-(1\(\rightarrow\)4)-N1,N3-bis(aminoiminomethyl)-, sulfate (2:3); Streptomycin sesquisulphate
Supplier/Manufacturer : 3420 Central Expressway, Santa Clara  CA 95051 3420 Central Expressway, Santa Clara  CA 95051
In case of emergency : Chemtrec: 1 800 424 9300 Outside USA & Canada: +1 703 527 3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
RESPIRATORY SENSITIZATION - Category 1
TOXIC TO REPRODUCTION (Fertility) - Category 1B
TOXIC TO REPRODUCTION (Unborn child) - Category 1B
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys) - Category 2

GHS label elements
Hazard pictograms :

Signal word : Danger
Hazard statements : Harmful if swallowed.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May damage fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure. (kidneys)

Precautionary statements
Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. In case of inadequate ventilation wear respiratory protection. Do not breathe dust. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth.
Storage : Store locked up.
Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified : None known.
Streptomycin Sulfate

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredient name</td>
<td>%</td>
</tr>
<tr>
<td>streptomycin sulphate</td>
<td>100</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.

Skin contact: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: No known significant effects or critical hazards.
Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact: No known significant effects or critical hazards.
Ingestion: Harmful if swallowed.

Over-exposure signs/symptoms

Eye contact: No specific data.
**Section 4. First aid measures**

**Inhalation**
- Adverse symptoms may include the following:
  - wheezing and breathing difficulties
  - asthma
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations

**Skin contact**
- Adverse symptoms may include the following:
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations

**Ingestion**
- Adverse symptoms may include the following:
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations

**Protection of first-aiders**
- No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**Notes to physician**
- In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**
- No specific treatment.

**Section 5. Fire-fighting measures**

**Extinguishing media**
- Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media: None known.

**Specific hazards arising from the chemical**
- No specific fire or explosion hazard.

**Hazardous thermal decomposition products**
- Decomposition products may include the following materials:
  - carbon dioxide
  - carbon monoxide
  - nitrogen oxides
  - sulfur oxides

**Special protective actions for fire-fighters**
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

See toxicological information (Section 11)

**Section 6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**
- No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Section 6. Accidental release measures

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For non-emergency personnel”.

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill: Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers contain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
Section 8. Exposure controls/personal protection

Individual protection measures

Hand protection
Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Eye/face protection
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Body protection
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection
Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection
Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Physical state
Solid.

Color
White to off-white [Light]

Odor
Odorless.

Flash point
Not available.

Auto-ignition temperature
Not available.

Flammable limits
Not available.

Molecular weight
1457.58 g/mole

Molecular formula
C42-H78-N14-O24.H6-O12-S3

pH
Not available.

Boiling/condensation point
Not applicable.

Melting/freezing point
Not applicable.

Relative density
Not applicable.

Vapor pressure
Not applicable.

Vapor density
Not available.

Volatility
Not available.

Evaporation rate
Not applicable.

Viscosity
Not available.

Solubility
Soluble in the following materials: cold water.
Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: No specific data.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>streptomycin sulphate</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>430 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>streptomycin sulphate</td>
<td>Category 2</td>
<td>Not determined</td>
<td>kidneys</td>
</tr>
</tbody>
</table>

Aspiration hazard

Not available.

Information on the likely routes of exposure: Not available.

Potential acute health effects

Eye contact: No known significant effects or critical hazards.
Section 11. Toxicological information

Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact: No known significant effects or critical hazards.

Ingestion: Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No specific data.

Inhalation: Adverse symptoms may include the following:
- wheezing and breathing difficulties
- asthma
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Skin contact: Adverse symptoms may include the following:
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Ingestion: Adverse symptoms may include the following:
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Long term exposure
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Potential chronic health effects
Not available.

General: May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: May damage the unborn child.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: May damage fertility.

Numerical measures of toxicity
Acute toxicity estimates
Not available.
Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>streptomycin sulphate</td>
<td>Acute EC50 0.133 mg/l Fresh water</td>
<td>Algae - Pseudokirchneriella subcapitata - Exponential growth phase</td>
<td>3 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 363000 µg/l Chronic NOEC 32 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours 21 days</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Bioaccumulative potential
Not available.

Mobility in soil

| Soil/water partition coefficient (K<sub>oc</sub>) | Not available. |

Other adverse effects
No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information
Section 14. Transport information

Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory information

U.S. Federal regulations: TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
Clean Air Act Section 602 Class I Substances: Not listed
Clean Air Act Section 602 Class II Substances: Not listed
DEA List I Chemicals (Precursor Chemicals): Not listed
DEA List II Chemicals (Essential Chemicals): Not listed
SARA 302/304
Composition/information on ingredients
No products were found.
SARA 304 RQ: Not applicable.
SARA 311/312
Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Fire hazard</th>
<th>Sudden release of pressure</th>
<th>Reactive</th>
<th>Immediate (acute) health hazard</th>
<th>Delayed (chronic) health hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>streptomycin sulphate</td>
<td>100</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
</tbody>
</table>

State regulations
Massachusetts: This material is not listed.
New York: This material is not listed.
New Jersey: This material is not listed.
Pennsylvania: This material is not listed.

California Prop. 65
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Cancer</th>
<th>Reproductive</th>
<th>No significant risk level</th>
<th>Maximum acceptable dosage level</th>
</tr>
</thead>
<tbody>
<tr>
<td>streptomycin sulphate</td>
<td>No.</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>

International regulations
Chemical Weapon Convention List Schedules I, II & III Chemicals
Section 15. Regulatory information

Not listed.

Montreal Protocol (Annexes A, B, C, E)
Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).

Canadian lists

Canadian NPRI : This material is not listed.
CEPA Toxic substances : This material is not listed.

Canada inventory : This material is listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>* 2</td>
</tr>
<tr>
<td>Flammability</td>
<td>0</td>
</tr>
<tr>
<td>Physical hazards</td>
<td>0</td>
</tr>
</tbody>
</table>

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Flammability
Health 2
Instability/Reactivity 0
Special 0

History

Date of issue/Date of revision : 04/29/2015.
Date of previous issue : 04/20/2015.
Version : 2

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations

* Indicates information that has changed from previously issued version.

Notice to reader
Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.