SAFETY DATA SHEET

Kanamycin Sulfate

Section 1. Identification

GHS product identifier : Kanamycin Sulfate
Code : 17924
Other means of identification : D-Streptamine, O-3-amino-3-deoxy-.alpha.-D-glucopyranosyl-(1→6)-O-[6-amino-6-deoxy-.alpha.-D-glucopyranosyl-(1→4)]-2-deoxy-, sulfate (1:1) (salt);
       Kanamycin sulfate; D-Streptamine, O-3-amino-3-deoxy-.alpha.-D-glucopyranosyl-(1→6)-O-[6-amino-6-deoxy-.alpha.-D-glucopyranosyl-(1→4)]-2-deoxy-, sulfate (1:1) (salt);
       kanamycin A sulfate; Kanamycin, sulfate (1:1) (salt)
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 : SKIN CORROSION/IRRITATION - Category 2
                                     SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
                                     RESPIRATORY SENSITIZATION - Category 1
                                     SKIN SENSITIZATION - Category 1
                                     TOXIC TO REPRODUCTION (Fertility) - Category 1B
                                     TOXIC TO REPRODUCTION (Unborn child) - Category 1B
GHS label elements
Hazard pictograms
Signal word : Danger
Hazard statements : Causes serious eye irritation.
                    Causes skin irritation.
                    May cause allergy or asthma symptoms or breathing difficulties if inhaled.
                    May cause an allergic skin reaction.
                    May damage fertility or the unborn child.
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. Wear protective gloves. Wear eye or face protection: Recommended: splash goggles. In case of inadequate ventilation wear respiratory protection: Recommended: Half- Face Respirator. Avoid breathing dust. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.
Response : 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 ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
Storage : Store locked up.
Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Kanamycin Sulfate

Section 2. Hazards identification

Hazards not otherwise classified: Fine dust clouds may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Substance</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>kanamycin sulphate</td>
<td>100</td>
<td>25389-94-0</td>
<td></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.

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: Wash with plenty of soap and 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. In the event of any complaints or symptoms, avoid further exposure. 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 so that 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. 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: Causes serious eye irritation.

Inhalation: Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs. 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: Causes skin irritation. May cause an allergic skin reaction.

Ingestion: Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms
Section 4. First aid measures

Eye contact: Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

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

Skin contact: Adverse symptoms may include the following:
- irritation
- redness
- 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

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.
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.

Indication of immediate medical attention and special treatment needed, if necessary

See toxicological information (Section 11)

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
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.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: 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. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

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. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

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 skin sensitization problems or 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. Avoid breathing dust. 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 retain 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: Storage temperature: 4°C (39.2°F). 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.

Individual protection measures
Hygiene measures
Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

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: chemical splash goggles. If operating conditions cause high dust concentrations to be produced, use dust goggles.

Skin protection
Hand protection
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.

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. Recommended: Lab coat. Gloves.

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. Recommended: Boots.

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. Recommended: Half- Face Respirator

Personal protective equipment (Pictograms)

Section 9. Physical and chemical properties

Physical state
Solid. [Powder.]

Color
Off-white. [Light]

Flash point
Not applicable.

Auto-ignition temperature
Not applicable.

Flammable limits
Not available.
Section 9. Physical and chemical properties

- **Molecular weight**: 582.66 g/mole
- **Molecular formula**: C18-H36-N4-O11.H2-O4-S
- **pH**: Not applicable.
- **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 applicable.
- **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**: Not available.
- **Irritation/Corrosion**: Not available.
- **Conclusion/Summary Skin**: Contact may cause irritation, dermatitis and hypersensitive individuals may experience an allergic reaction.
- **Eyes**: Contact may cause irritation.
- **Respiratory**: May cause irritation and hypersensitive individuals may experience an allergic reaction.
- **Sensitization**: Not available.
- **Conclusion/Summary Skin**: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals
- **Respiratory**: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals
- **Mutagenicity**: Not available.
- **Carcinogenicity**:
Section 11. Toxicological information

Not available.

Reproductive toxicity
Not available.

Teratogenicity
Not available.

Specific target organ toxicity (single exposure)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Not available.

Potential acute health effects

Eye contact
Causes serious eye irritation.

Inhalation
Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs. 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
Causes skin irritation. May cause an allergic skin reaction.

Ingestion
Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact
Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

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

Skin contact
Adverse symptoms may include the following:
- irritation
- redness
- 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
Section 11. Toxicological information

Potential immediate effects : Not available.
Potential delayed effects : Not available.
Potential chronic health effects : Not available.

General : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. 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>kanamycin sulphate</td>
<td>Acute EC50 115000 µg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Bioaccumulative potential
Not available.

Mobility in soil

| Soil/water partition coefficient (Koc) | 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

<table>
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<tr>
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<th>DOT Classification</th>
<th>TDG Classification</th>
<th>Mexico Classification</th>
<th>ADR/RID</th>
<th>IMDG</th>
<th>IATA</th>
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<td><strong>UN proper shipping name</strong></td>
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<td><strong>Transport hazard class(es)</strong></td>
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<td><strong>Packing group</strong></td>
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<td><strong>Environmental hazards</strong></td>
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</tbody>
</table>

### 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

- **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

- **Classification**: Not applicable.

#### SARA 311/312

- **Composition/information on ingredients**
  
  Immediate (acute) health hazard
  Delayed (chronic) health hazard
Section 15. Regulatory information

<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>
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</thead>
<tbody>
<tr>
<td>kanamycin 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.

International regulations

- **Chemical Weapon Convention List Schedules I, II & III Chemicals**: Not listed.
- **Stockholm Convention on Persistent Organic Pollutants**: Not listed.
- **UNECE Aarhus Protocol on POPs and Heavy Metals**: Not listed.

Canada

- **WHMIS (Canada)**: Not controlled under WHMIS (Canada).
- **Canadian lists**
  - **Canadian NPRI**: This material is not listed.
  - **CEPA Toxic substances**: This material is not listed.
  - **Canada inventory**: Not determined.

Section 16. Other information

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

- Health: 2
- Flammability: 0
- Physical hazards: 0

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

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

- Flammability: 0
- Instability/Reactivity: 0

History

- **Date of issue/Date of revision**: 11/19/2014.
- **Date of previous issue**: No previous validation.
- **Version**: 1
Section 16. Other information

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

Notice to reader

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.