Material Safety Data Sheet

1. Product and company identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>Bovine Serum Albumin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier</td>
<td>Thermo Fisher Scientific Pierce Biotechnology</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Thermo Fisher Scientific Pierce Biotechnology</td>
</tr>
<tr>
<td>Product No.</td>
<td>0077117 1901804</td>
</tr>
<tr>
<td>MSDS #</td>
<td>7629</td>
</tr>
<tr>
<td>Validation date</td>
<td>9/28/2009</td>
</tr>
<tr>
<td>Print date</td>
<td>9/28/2009</td>
</tr>
<tr>
<td>Responsible name</td>
<td>MSDS Specialist</td>
</tr>
<tr>
<td>In case of emergency</td>
<td>CHEMREC: Use of 800.424.3300 Substance/Preparation or OUTSIDE US: 202.483.7616</td>
</tr>
</tbody>
</table>

2. Hazards identification

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid, [crystalline powder]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA/HCS status</td>
<td>This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910) 1200.</td>
</tr>
<tr>
<td>Emergency overview</td>
<td>WARNING! Causes respiratory tract, eye, and skin irritation. Inhalation to eyes, respiratory system and skin. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose, and throat. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.</td>
</tr>
<tr>
<td>Routes of entry</td>
<td>Eye contact, inhalation, ingestion.</td>
</tr>
<tr>
<td>Potential acute health effects</td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>Irritating to respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin</td>
<td>Irritating to skin.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Irritating to eyes.</td>
</tr>
<tr>
<td>Potential chronic health effects</td>
<td></td>
</tr>
<tr>
<td>Chronic effects</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Teratogenicity</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

2. Hazards identification

<table>
<thead>
<tr>
<th>Developmental effects</th>
<th>No known significant effects or critical hazards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility effects</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Over-exposure signs/symptoms</td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>Adverse symptoms may include the following: respiratory tract irritation, coughing.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Skin</td>
<td>Adverse symptoms may include the following: irritation, redness.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Adverse symptoms may include the following: pain or irritation, watering, redness.</td>
</tr>
<tr>
<td>Medical conditions aggravated by over-exposure</td>
<td>None known.</td>
</tr>
</tbody>
</table>

The preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments. Classification: Not classified. See toxicological information (section 11).

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>United States</th>
<th>Name</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4432-31-9</td>
</tr>
<tr>
<td></td>
<td>MES</td>
<td>45 - 65</td>
</tr>
</tbody>
</table>

Substance/preparation: Preparation

There are no ingredients or 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.

4. First aid measures

Inhalation: Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. 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 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.

MSDS #8339 COVER SHEET

<table>
<thead>
<tr>
<th>Component #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>77672</td>
<td>Inject EDC BSA Spin Kit</td>
</tr>
<tr>
<td>0077171</td>
<td>Inject BSA in MES Buffer</td>
</tr>
<tr>
<td>0077162</td>
<td>Inject EDC Conjugation Buffer</td>
</tr>
<tr>
<td>0077149</td>
<td>EDC</td>
</tr>
<tr>
<td>1862207</td>
<td>Inject Purification Buffer Salts</td>
</tr>
<tr>
<td>1859836</td>
<td>Zeba Desalt Spin Column</td>
</tr>
</tbody>
</table>
4. First aid measures

Ingestion: Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. 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 adverse health effects persist or are severe. 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 wristband.

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

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.

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. See section 11 for more detailed information on health effects and symptoms.

5. Fire-fighting measures

Flammability of the product: No specific fire or explosion hazard.

Extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Suitable: None known.

Not suitable: None known.

Special exposure hazards: 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.

Hazardous combustion products: Decomposition products may include the following materials:
- Carbon oxides
- Nitrogen oxides
- Sulfur oxides

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.

6. Accidental release measures

Personal precautions: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding area. 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 (see section 8).

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).

Large spill: Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, 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.

Small spill: Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling: Put on appropriate personal protective equipment (see section 8). 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. Do not breathe dust. Do not ingest. Avoid contact with eyes, skin and clothing. 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 re-use container.

Storage: 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. 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.

8. Exposure controls/personal protection

Europe: No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures:
- If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures:
- 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.

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection:
- Respiratory: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.
- Hands: 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.
Bovine Serum Albumin

8. Exposure controls/personal protection

Eyes
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 operating conditions cause high dust concentrations to be produced, use dust goggles.

Skin
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.

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.

9. Physical and chemical properties

Physical state
Solid. [Crystalline powder.]

Color
White.

Solubility
Easily soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability
The product is stable. Under normal conditions of storage and use, hazardous polymerization 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.

Possibility of hazardous reactions
Will not occur.

11. Toxicological information

United States

Acute toxicity
Conclusion/Summary: Not available.

Chronic toxicity
Conclusion/Summary: Not available.

Carcinogenicity
Conclusion/Summary: Not available.

Classification
Product/ingredient name
ACGIH IARC EPA NIOSH NTP OSHA
4-morpholineethanesulfonic acid monohydrate
- - - None. None.

Mutagenicity
Conclusion/Summary: Not available.

Teratogenicity
Conclusion/Summary: Not available.

Reproductive toxicity
Conclusion/Summary: Not available.

01/28/2009.

12. Ecological information

Environmental effects
No known significant effects or critical hazards.

Aquatic ecotoxicity
Conclusion/Summary: Not available.

Other adverse effects
No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal
The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Hazardous waste
Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information

DOT Classification
Not regulated.

IATA-QGR Class
Not available. Not available. Not available.

PG*: Packing group
PG*: None.