

# MATERIAL SAFETY DATA SHEET

<b>NFPA</b>	<b>HMIS</b>	<b>Personal Protective Equipment</b>						
	<table border="1"> <tr> <td>Health Hazard</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Fire Hazard</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Reactivity</td> <td style="text-align: center;">0</td> </tr> </table>	Health Hazard	1	Fire Hazard	1	Reactivity	0	
Health Hazard	1							
Fire Hazard	1							
Reactivity	0							
See Section 8.								

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION	
<b>Product code:</b>	L3109
<b>Product Name:</b>	LEUPEPTIN HEMISULFATE, SYNTHETIC
<b>Chemical Name:</b>	L-Leucinamide, N-acetyl-L-leucyl-N-[(1S)-4-[(aminoiminomethyl)amino]-1-formylbutyl]-sulfate(2:1)
<b>Synonyms:</b>	Acetyl-L-leucyl-L-leucyl-L-argininal Sulfate N-Acetyl-L-leucyl-L-leucyl-argininal hemisulfate
<b>Recommended use:</b>	No information available.
<b>CAS #:</b>	103476-89-7
<b>Formula:</b>	C <sub>20</sub> -H <sub>38</sub> -N <sub>6</sub> -O <sub>4</sub> . 1/2 H <sub>2</sub> SO <sub>4</sub>
<b>RTECS #</b>	Not available
<b>CI#:</b>	Not available
<b>Supplier:</b>	Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000
<b>Emergency Telephone Number:</b>	CHEMTREC: 1-800-424-9300
<b>Contact Person:</b>	Martin LaBenz (West Coast)
<b>Contact Person:</b>	Chris Terpak (East Coast)

## 2. HAZARDS IDENTIFICATION

<b>EMERGENCY OVERVIEW</b>			
May cause skin and eye irritation. May cause irritation of respiratory tract.			
<b>Odor:</b> No information available	<b>Physical state:</b> Solid.	<b>Appearance:</b> Powder. (lyophilised).	<b>Color:</b> White. Off-white.

**OSHA Regulatory Status**      This material is not considered hazardous by the OSHA Hazard Communication Standard (29 1910.1200)

## 2. HAZARDS IDENTIFICATION

### POTENTIAL HEALTH EFFECTS

**Principal Routes of Exposure:**

Ingestion. Inhalation.

**Acute Potential Health Effects:****Skin Contact:**

May cause skin irritation.

**Eye Contact:**

May cause eye irritation.

**Inhalation:**

May cause irritation of respiratory tract.

**Ingestion:**

May cause digestive (gastrointestinal) tract irritation.

**Chronic Potential Health Effects:**

**Target Organs:** No information available

**Carcinogen Status:** No information available

**Mutagenic Effects:** No information available

**Teratogenic Effects:** No information available

**Aggravated Medical Conditions:** No information available

See Section 11 for additional Toxicological Information

### POTENTIAL ENVIRONMENTAL EFFECTS

No information available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Leupeptin Hemisulfate	103476-89-7	100

## 4. FIRST AID MEASURES

**General Advice:**

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

**Skin Contact:**

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

**Eye Contact:**

Flush eye with water for 15 minutes. Get medical attention if irritation occurs. If symptoms persist, call a physician.

**Inhalation:**

Move to fresh air. If breathing is difficult, give oxygen. In case of shortness of breath, give oxygen. Get medical attention.

**Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

**Notes to Physician:** Treat symptomatically

## 5. FIRE-FIGHTING MEASURES

### Flammable Properties

<b>Flashpoint (°C/°F):</b>	Not applicable.
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<b>Lower Explosion Limit (%):</b>	No information available
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<b>Upper Explosion Limit (%):</b>	No information available
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<b>Autoignition Temperature (°C/°F):</b>	No information available
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**Suitable Extinguishing Media:** Carbon dioxide (CO<sub>2</sub>). Dry chemical. Water spray mist or foam.

**Unsuitable Extinguishing Media:** No information available.

**Hazardous Combustion Products:** Carbon monoxide; Carbon dioxide; Nitrogen oxides, sulfur oxides

**Specific hazards:** May be combustible at high temperatures.

**Special Protective Equipment for Firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

**Specific Methods:** No information available.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal Precautions:

Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Remove all sources of ignition.

### Environmental Precautions:

No information available..

### Methods for Cleaning Up:

Sweep up and shovel into suitable containers for disposal. Avoid dust formation. Clean contaminated surface thoroughly.

## 7. HANDLING AND STORAGE

### Handling

#### Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

**Safe Handling Advice:**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Do not ingest. Do not breathe vapours/dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

**Storage****Technical Measures/Storage Conditions:**

Keep container tightly closed in a dry and well-ventilated place. Freeze. Store at 0 deg. °C. Store away from incompatible materials.

**Incompatible Products:**

Oxidizing agents. Acids. Bases.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Engineering measures to reduce exposure:**

Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protective Equipment**

**Eye protection:** Safety glasses. Safety glasses with side-shields.

**Skin and body protection:** Long sleeved clothing. Chemical resistant apron. Gloves.

**Respiratory protection:** Wear respirator with dust filter.

**Hygiene measures:** Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

**National occupational exposure limits****United States**

U.S Occupational Exposure Limits: Not determined

**Canada**

Canada Occupational Exposure Limits: Not determined

**Australia and Mexico**

Occupational Exposure Limits for Australia and Mexico: Not determined

**9. PHYSICAL AND CHEMICAL PROPERTIES**

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b> Solid	<b>Appearance:</b> Powder. (lyophilised).	<b>Color:</b> White. Off-white.
<b>Odor:</b> No information available	<b>Taste</b> No information available	<b>Molecular weight:</b> 475.63
<b>Flash point (°C) :</b> Not determined	<b>Lower Explosion Limit (%):</b> No information available	<b>Upper Explosion Limit (%):</b> No information available
<b>Autoignition Temperature (°C/°F):</b> No information available	<b>pH:</b> No information available	<b>Boiling point/range(°C/°F):</b> No information available
<b>Melting point/range(°C/°F):</b> No information available	<b>Decomposition temperature(°C/°F):</b> No information available	<b>Specific gravity:</b> No information available
<b>Density (g/cm3):</b> No information available	<b>Bulk density:</b> No information available	<b>Vapor pressure @ 20°C (kPa):</b> No information available
<b>Vapor density:</b> No information available	<b>Evaporation rate:</b> No information available	<b>VOC content (g/L):</b> No information available
<b>Odor threshold (ppm):</b> No information available	<b>Partition coefficient (n-octanol/water):</b> No information available	<b>Miscibility:</b> No information available

### **Solubility:**

Soluble in Water  
Soluble in Methanol  
Soluble in Ethanol

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable at normal conditions
<b>Conditions to avoid:</b>	Heat. Avoid dust formation. Dust may form explosive mixture in air. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
<b>Materials to avoid:</b>	Strong oxidising agents. Strong acids. Strong bases.
<b>Hazardous decomposition products:</b>	Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx). Sulphur oxides.
<b>Possibility of Hazardous Reactions:</b>	No information available
<b>Polymerization:</b>	Hazardous polymerisation does not occur
<b>Corrosivity:</b>	No information available
<b>Special Remarks on Corrosivity:</b>	No information available

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

### Component Information

Leupeptin Hemisulfate - 103476-89-7

- LD50/oral/rat = No information available
- LD50/oral/mouse = No information available
- LD50/dermal/rabbit = Not determined
- LD50/dermal/rat = No information available
- LC50/inhalation/rat = No information available
- LC50/inhalation/mouse = No information available

**Product Information**

- LC50/inhalation/rat = No information available
- LC50/Inhalation/mouse = No information available
- LD50/dermal/rabbit = No information available
- LD50/dermal/rat = Not information available
- LD50/oral/rat = No information available
- LD50/oral/mouse = No information available

**Local Effects**

- Skin irritation:** May cause skin irritation.
- Eye irritation:** Contact with eyes may cause irritation.
- Inhalation:** May cause irritation of respiratory tract.
- Ingestion:** May cause digestive (gastrointestinal) tract irritation.
- Sensitization:** No information available

**Chronic Toxicity**

- Chronic Toxicity** No information available
- Carcinogenic effects:** No information available
- Mutagenic Effects:** No information available
- Reproductive Effects:** No information available
- Teratogenic Effects:** No information available
- Target Organs:** No information available

**12. ECOLOGICAL INFORMATION**

**ECOTOXICITY**

- Toxicity to terrestrial and aquatic plants and animals:** No information available
- Ecotoxicity effects:** No data available
- Aquatic toxicity:** No information available
- Mobility:** No information available
- Persistence and degradability:** No information available

Bioaccumulative potential: No information available

### 13. DISPOSAL CONSIDERATIONS

**Waste from residues / unused products:**

Waste must be disposed of in accordance with Federal, State and Local regulation.

**Contaminated packaging:**

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Leupeptin Hemisulfate	None	None	None	None

### 14. TRANSPORT INFORMATION

**DOT**

**UN-No:** Not regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Packing Group:** None  
**Subsidiary Risk:** Not applicable  
**Marine Pollutant:** No data available  
**ERG No:** No information available  
**DOT RQ (lbs):** No information available

**TDG (Canada)**

**Proper Shipping Name:** No information available  
**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Description:** No information available

**ADR**

**Proper Shipping Name:** No information available  
**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Classification Code:** No information available  
**Description:** No information available  
**CEFIC Tremcard No:** No information available

**IMO / IMDG**

**Proper Shipping Name:** No information available  
**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Subsidiary Risk:** No information available  
**Packing Group:** No information available  
**Description:** No information available  
**IMDG Page:** No information available  
**Marine Pollutant:** No information available  
**MFAG:** No information available  
**Maximum Quantity:** No information available

**RID**

**Proper Shipping Name:** No information available  
**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Classification Code:** No information available  
**Description:** No information available

**ICAO**

**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Proper Shipping Name:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Description:** No information available

**IATA**

**Proper Shipping Name:** No information available  
**UN-No:** Not regulated  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Description:** No information available

**15. REGULATORY INFORMATION**

**International Inventories**

Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
<i>Leupeptin Hemisulfate</i>	Not Listed	Not present	Not present	Not present	Present	Not present	Not present

**U.S. Regulations**

**California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.**

**Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
<i>Leupeptin Hemisulfate</i>	Not Listed	Not Listed	Not Listed	Not Listed

**CERCLA/SARA**

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
<i>Leupeptin Hemisulfate</i>	None	None	None	None	None

**U.S. TSCA**



Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Leupeptin Hemisulfate	Not Applicable	Not Applicable

## Canada

**WHMIS hazard class:**  
Non-controlled

## Inventory

Components	Canada (DSL)	Canada (NDSL)
Leupeptin Hemisulfate	Not Listed	Not Listed

## EU Classification

**R -phrase(s)**  
not determined

**S -phrase(s)**  
none

The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**  
Not dangerous

## 16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

**Preparation Date**                      23-Jun-2010

**Reason for revision:**                Not applicable

**Prepared by:**                            Sonia Owen

**Literature reference:**                No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.