1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name: Cyanamide
Product Code: SC-239592

Recommended use of the chemical and restrictions on use
For research use only. Not intended for diagnostic or therapeutic use.

2. HAZARDS IDENTIFICATION

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification
- Acute toxicity - Oral: Category 3
- Acute toxicity - Dermal: Category 4
- Acute toxicity - Inhalation (Vapors): Category 2
- Skin corrosion/irritation: Category 2
- Serious eye damage/eye irritation: Category 2
- Skin sensitization: Category 1

Label elements
Signal word: Danger
Hazard statements:
- Toxic if swallowed
- Harmful in contact with skin
- Fatal if inhaled
- Causes skin irritation
- Causes serious eye irritation
- May cause an allergic skin reaction

Symbols/Pictograms

Precautionary Statements - Prevention
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Wear protective gloves/protective clothing/eye protection/face protection
- Do not breathe dust/fume/gas/mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Wear respiratory protection
- Contaminated work clothing should not be allowed out of the workplace
Precautionary Statements - Response
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 advice/attention
IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/physician if you feel unwell. Take off contaminated clothing and wash before reuse.
If skin irritation or rash occurs: Get medical advice/attention
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.

Precautionary Statements - Storage
Store locked up. Store in a well-ventilated place. Keep container tightly closed.

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC)
Hazards not otherwise classified (HNOC)
Not applicable.

Other Information
Toxic to aquatic life with long lasting effects.

Unknown acute toxicity
0% of the mixture consists of ingredient(s) of unknown toxicity.

NFPA
| Health hazards | 3 |
| Flammability | 1 |
| Stability | 0 |
| Physical and chemical properties | - |

HMIS
| Health hazards | 3 |
| Flammability | 1 |
| Physical hazards | 0 |
| Personal protection | - |

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight %</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>420-04-2</td>
<td>&gt;98</td>
<td>= 125 mg/kg (Rat)</td>
<td>= 84 mg/kg (Rat) = 590 mg/kg (Rabbit)</td>
<td>&gt; 1 mg/L (Rat) 4 h</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First Aid Measures
General advice
Immediate medical attention is required.

Eye contact
Keep eye wide open while rinsing. Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Do not rub affected area.

Skin Contact
Immediate medical attention is required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash off immediately with soap and plenty of water.

Inhalation
Remove to fresh air. Call a physician or poison control center immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion
Do NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Remove from exposure, lie down. Clean mouth with water and drink afterwards plenty of water. Call a physician or poison control center immediately.

Self-protection of the first aider
Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed
Symptoms
No information available.

Indication of any immediate medical attention and special treatment needed
Note to physicians
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media
None.

Specific hazards arising from the chemical
Specific hazards arising from the chemical
The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe fumes.

Hazardous combustion products

Explosion data
Sensitivity to Mechanical Impact
No information available.

Sensitivity to Static Discharge
No information available.

Protective equipment and precautions for firefighters
Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Personal precautions
Use personal protective equipment as required. Evacuate personnel to safe areas. Avoid contact with skin, eyes or clothing. Keep people away from and upwind of spill/leak.

Environmental precautions
Environmental precautions
Do not allow into any sewer, on the ground or into any body of water. Should not be released into the environment. Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up
Methods for containment
Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up
Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Use personal protective equipment as required. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Avoid creating dust. Soak up with inert absorbent material. Dam up. After cleaning, flush away traces with water.
7. HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Ensure adequate ventilation, especially in confined areas. In case of insufficient ventilation, wear suitable respiratory equipment. Use only with adequate ventilation and in closed systems.

Conditions for safe storage, including any incompatibilities
Storage Conditions
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep containers tightly closed in a cool, well-ventilated place. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Protect from moisture. Desiccate at 4 °C.

Incompatible materials
Incompatible with strong acids and bases. Incompatible with oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure Guidelines
Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>TWA: 2 mg/m³</td>
<td>(vacated) TWA: 2 mg/m³</td>
<td>TWA: 2 mg/m³</td>
</tr>
</tbody>
</table>

NIOSH IDLH Immediately Dangerous to Life or Health

Appropriate engineering controls
Engineering Controls
Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment
Eye/face protection
Tight sealing safety goggles. Face protection shield.

Skin and Body Protection
Wear protective gloves and protective clothing.

Respiratory protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations
When using do not eat, drink or smoke. Wash contaminated clothing before reuse. Keep away from food, drink and animal feeding stuffs. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Take off all contaminated clothing and wash it before reuse. Wear suitable gloves and eye/face protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State
Solid

Appearance
No information available

Odor
Odorless
### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>45 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash point</td>
<td>141 °C CC (closed cup)</td>
</tr>
<tr>
<td>Density</td>
<td>1.28 g/cm³</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>1.45</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.28</td>
</tr>
<tr>
<td>Water solubility</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>-0.82</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>360 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No information available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### Reactivity
- Not applicable

#### Chemical stability
- Stable under recommended storage conditions.

#### Possibility of Hazardous Reactions
- Contact with acids may liberate toxic gas.

#### Hazardous polymerization
- No information available.

#### Conditions to avoid
- Exposure to air or moisture over prolonged periods.

#### Incompatible materials
- Incompatible with strong acids and bases. Incompatible with oxidizing agents.

#### Hazardous Decomposition Products
- Thermal decomposition can lead to release of irritating and toxic gases and vapors. Hydrogen cyanide. Carbon oxides. Nitrogen oxides (NOx).

### 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure
- **Inhalation**: No data available.
- **Eye contact**: No data available.
- **Skin Contact**: No data available.
- **Ingestion**: No data available.

#### Information on toxicological effects
- **Symptoms**: No information available.
- **Delayed and immediate effects as well as chronic effects from short and long-term exposure**
  - **Chronic Toxicity**: Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Avoid repeated exposure. Possible risk of irreversible effects.
  - **Target Organ Effects**: Central nervous system, Eyes, Respiratory system, Skin.

#### Numerical measures of toxicity - Product Information
- **Unknown acute toxicity**: 0% of the mixture consists of ingredient(s) of unknown toxicity
- **The following values are calculated based on chapter 3.1 of the GHS document**
  - ATEmix (oral): 125 mg/kg
  - ATEmix (dermal): 1100 mg/kg
  - ATEmix (inhalation-vapor): 1 mg/l
12. ECOLOGICAL INFORMATION

Ecotoxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>13.5: 96 h</td>
<td>87: 96 h Cyprinus carpio mg/L LC50 1.75 - 2.11: 96 h Oncorhynchus mykiss mM LC50 semi-static 88: 96 h Lepomis macrochirus mg/L LC50 static 44: 96 h Lepomis macrochirus mg/L LC50</td>
<td>-</td>
<td>3.2: 48 h Daphnia magna mg/L EC50</td>
</tr>
<tr>
<td>420-04-2</td>
<td>Pseudokirchneriella subcapitata mg/L EC50 2.5: 72 h Desmodesmus subspicatus mg/L EC50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Mobility
No information available.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>-0.82</td>
</tr>
<tr>
<td>420-04-2</td>
<td></td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Disposal of wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
Do not reuse container.

Other Information
Waste codes should be assigned by the user based on the application for which the product was used.

US EPA Waste Number
D002

14. TRANSPORT INFORMATION

DOT
UN/ID no UN2923
Hazard Class 8
Subsidiary class 6.1
Packing Group III
Proper shipping name Corrosive solids, toxic, n.o.s.
Description UN2923, Corrosive solids, toxic, n.o.s. (Cyanamide), 8 (6.1), III
Emergency Response Guide Number 154

IMDG
UN/ID no UN2923
Hazard Class 8
Subsidiary hazard class 6.1
Packing Group III
Proper shipping name Corrosive solid, toxic, n.o.s.
Description UN2923, Corrosive solid, toxic, n.o.s. (Cyanamide), 8 (6.1), III
Special Provisions 223, 274
EmS-No F-A, S-B

IATA
Santa Cruz Biotechnology, Inc. www.scbt.com
UN/ID no: UN2923
Hazard Class: 8
Subsidiary hazard class: 6.1
Packing Group: III
Proper shipping name: Corrosive solid, toxic, n.o.s.
Description: UN2923, Corrosive solid, toxic, n.o.s. (Cyanamide), 8 (6.1), III

15. REGULATORY INFORMATION

International Inventories
All of the components in the product are on the following Inventory lists:
- TSCA (United States): Canada (DSL/NDSL) Europe (EINECS/ELINCS/NLP) Australia (AICS) South Korea (KECL): China (IECSC) ENCS (Japan):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>KECL</th>
<th>PICCS</th>
<th>AICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

X - Listed
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS - Japan Existing and New Chemical Substances
- IECSC - China Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
- Acute health hazard: Yes
- Chronic Health Hazard: Yes
- Fire hazard: No
- Sudden release of pressure hazard: No
- Reactive hazard: No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanamide</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>420-04-2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

Revision note: No information available
Disclaimer
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet