1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Calcium cyanamide
Product Number : EX-040277
Brand : Exir
Product Use : For laboratory research purposes.
Firma : Exir GmbH
Flotowgasse 18-22/2/1
1190 WIEN
AUSTRIA
Telefon : +43 (0) 19463937
Fax : +43 (0) 19462797
Email-Adresse : info@exir.co.at
Emergency Phone # : +43 (0) 14064343

2. HAZARDS IDENTIFICATION

Emergency Overview

WHMIS Classification
B6 Reactive Flammable Material Water Reactive
D2B Toxic Material Causing Other Toxic Effects Severe eye irritant

GHS Classification
Substances and mixtures, which in contact with water, emit flammable gases (Category 3)
Acute toxicity, Oral (Category 4)
Serious eye damage (Category 1)
Skin sensitisation (Category 1)
Specific target organ toxicity - single exposure (Category 3), Respiratory system

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H261 In contact with water releases flammable gases.
H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.

Precautionary statement(s)
P231 + P232 Handle under inert gas. Protect from moisture.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ eye protection/ face protection.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P422 Store contents under inert gas.
HMIS Classification

- Health hazard: 2
- Flammability: 3
- Physical hazards: 1

Potential Health Effects

- Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
- Skin: Harmful if absorbed through skin. Causes skin irritation.
- Eyes: Causes eye irritation.
- Ingestion: Harmful if swallowed.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Cyanamidecalcium salt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cyanamidemcalcium derivative</td>
</tr>
<tr>
<td>MDL</td>
<td>MFCD00064894</td>
</tr>
<tr>
<td></td>
<td>Beilstein: 4124391</td>
</tr>
<tr>
<td>Formula</td>
<td>CCaN2</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>80.10 g/mol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>156-62-7</td>
<td>205-861-8</td>
<td>615-017-00-4</td>
<td>&lt;=100%</td>
</tr>
</tbody>
</table>

### 4. FIRST AID MEASURES

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 5. FIREFIGHTING MEASURES

**Conditions of flammability**
May burn in presence of air, or emit a flammable gas in the presence of water or water vapour. Keep away from heat/sparks/open flame/hot surface/air/water. No smoking.

**Suitable extinguishing media**
Dry powder

**Special protective equipment for firefighters**
Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**
Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx), Calcium oxide

**Explosion data - sensitivity to mechanical impact**
No data available

**Explosion data - sensitivity to static discharge**
No data available

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Never allow product to get in contact with water during storage. Moisture sensitive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium cyanamide</td>
<td>156-62-7</td>
<td>TWA</td>
<td>0.5 mg/m3</td>
<td>Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)</td>
</tr>
</tbody>
</table>

Remarks: Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required

<table>
<thead>
<tr>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>0.5 mg/m3</td>
<td>Canada. British Columbia OEL</td>
</tr>
<tr>
<td>TWAEV</td>
<td>0.5 mg/m3</td>
<td>Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants</td>
</tr>
<tr>
<td>TWA</td>
<td>0.5 mg/m3</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Specific engineering controls
Use mechanical exhaust or laboratory fume hood to avoid exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Appearance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>solid</td>
</tr>
<tr>
<td>Colour</td>
<td>no data available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>no data available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point/range: &gt; 300 °C (&gt; 572 °F) - lit.</td>
</tr>
<tr>
<td>Boiling point</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>no data available</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>850 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>&gt; 850 °C (&gt; 1,562 °F)</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>no data available</td>
</tr>
<tr>
<td>Density</td>
<td>no data available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>29.4 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>no data available</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>no data available</td>
</tr>
<tr>
<td>Odour</td>
<td>no data available</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>no data available</td>
</tr>
<tr>
<td>Evapouration rate</td>
<td>no data available</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

| Chemical stability | Stable under recommended storage conditions. |

Possibility of hazardous reactions

Reacts violently with water.

Conditions to avoid
Avoid moisture.
Exposure to moisture.

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx), Calcium oxide
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

<table>
<thead>
<tr>
<th>Oral LD50</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 Oral - rat - male and female</td>
<td>765 mg/kg</td>
</tr>
</tbody>
</table>
Inhalation LC50
LC50 Inhalation - rat - male and female - 4 h - > 155 mg/m³

Dermal LD50
LD50 Dermal - rabbit - male and female - > 2,000 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/irritation
Skin - rabbit - No skin irritation - 4 h - OECD Test Guideline 404

Serious eye damage/eye irritation
Eyes - rabbit - Risk of serious damage to eyes. - 24 h - OECD Test Guideline 405

Respiratory or skin sensitisation
Maximisation Test - guinea pig - May cause sensitisation by skin contact. - OECD Test Guideline 406

Germ cell mutagenicity
Genotoxicity in vitro - Hamster - ovary - with and without metabolic activation - negative
Genotoxicity in vivo - rat - male and female - Oral - negative

Carcinogenicity
Carcinogenicity - mouse - Oral
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
no data available

Teratogenicity
no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
Inhalation - May cause respiratory irritation. - Lungs

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

<table>
<thead>
<tr>
<th>Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. Causes respiratory tract irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Skin</td>
<td>Harmful if absorbed through skin. Causes skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
</tbody>
</table>

Signs and Symptoms of Exposure
Headache, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
no data available

Additional Information
RTECS: GS6000000

12. ECOLOGICAL INFORMATION

Toxicity

Exir - EX-040277
Toxicity to fish
semi-static test LC50 - Danio rerio (zebra fish) - 140 mg/l - 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates
Immobilization EC50 - Daphnia magna (Water flea) - 6 mg/l - 48 h
Method: OECD Test Guideline 202

Toxicity to algae
Growth inhibition EC50 - Selenastrum capricornutum (green algae) - 27.54 mg/l - 72 h
Method: OECD Test Guideline 201

Toxicity to bacteria
Respiration inhibition EC50 - Sludge Treatment - > 300 mg/l - 3 h

Persistence and degradability
Biodegradability aerobic
Result: 0 % - Not biodegradable.
Method: OECD Test Guideline 301B

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1403 Class: 4.3 Packing group: III
Proper shipping name: Calcium cyanamide
Reportable Quantity (RQ): 1000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1403 Class: 4.3 Packing group: III EMS-No: F-G, S-N
Proper shipping name: CALCIUM CYANAMIDE
Marine pollutant: No

IATA
UN number: 1403 Class: 4.3 Packing group: III
Proper shipping name: Calcium cyanamide

15. REGULATORY INFORMATION

WHMIS Classification
B6 Reactive Flammable Material Water Reactive
D2B Toxic Material Causing Other Toxic Effects Severe eye irritant

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
16. OTHER INFORMATION

Further information

Copyright 2014 Exir Co. LLC. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Exir Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.Exir.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.