Section 1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Code: 13357
Product Name: Milrinone
Synonyms: 1,6-dihydro-2-methyl-6-oxo-[3,4'-bipyridine]-5-carbonitrile; Primacor®; WIN 47,203;

1.2 Relevant identified uses of the substance or mixture and uses advised against:
Relevant identified uses: For research use only, not for human or veterinary use.

1.3 Details of the Supplier of the Safety Data Sheet:

Company Name: Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Web site address: www.caymanchem.com
Information: Cayman Chemical Company +1 (734) 971-3335

1.4 Emergency telephone number:

Emergency Contact: CHEMTREC Within USA and Canada: +1 (800) 424-9300
CHEMTREC Outside USA and Canada: +1 (703) 527-3887

Section 2. Hazards Identification

2.1 Classification of the Substance or Mixture:
2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]:
Acute Toxicity: Inhalation, Category 2
Acute Toxicity: Oral, Category 3
Acute Toxicity: Skin, Category 3

2.2 Label Elements:
2.2.1 Labeling according to Regulation (EC) No 1272/2008 [CLP]:

GHS Signal Word: Danger
GHS Hazard Phrases:
H330: Fatal if inhaled.
H301: Toxic if swallowed.
H311: Toxic in contact with skin.

GHS Precaution Phrases:
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P284: In case of inadequate ventilation, wear respiratory protection.
P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P361+364: Take off immediately all contaminated clothing and wash it before reuse.

GHS Response Phrases:
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310: Immediately call a POISON CENTER/doctor/... 
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P330: Rinse mouth.
2.3 Adverse Human Health Effects and Symptoms:
Material may be irritating to the mucous membranes and upper respiratory tract.
May cause eye, skin, or respiratory system irritation.
Stimulates cardiac muscle contraction.
Toxic by contact with skin and if swallowed.
Vasodilator.
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

### Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS # / RTECS #</th>
<th>Hazardous Components (Chemical Name)/REACH Registration No.</th>
<th>Concentration</th>
<th>EC No./EC Index No.</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>78415-72-2</td>
<td>Milrinone</td>
<td>100.0 %</td>
<td>278-903-6</td>
<td>Acute Tox.(l) 2: H330</td>
</tr>
<tr>
<td>DW1762000</td>
<td></td>
<td></td>
<td>NA</td>
<td>Acute Tox.(D) 3: H311</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Acute Tox.(O) 3: H301</td>
</tr>
</tbody>
</table>

### Section 4. First Aid Measures

4.1 Description of First Aid Measures:
- **No data available.**

  - **In Case of Inhalation:** Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
  - **In Case of Skin Contact:** Immediately wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.
  - **In Case of Eye Contact:** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Have eyes examined and tested by medical personnel.
  - **In Case of Ingestion:** Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

4.2 Important Symptoms and Effects, Both Acute and Delayed:
Exposure may cause: ataxia, blood disorders, gastrointestinal disturbance, and/or shortness of breath.

### Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media:
- Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.
- Use water spray to cool fire-exposed containers.

**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

5.2 Flammable Properties and Hazards:
- **Flash Pt:** No data.
- **Explosive Limits:** LEL: No data. UEL: No data.
- **Autoignition Pt:** No data.

5.3 Fire Fighting Instructions:
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Section 6. Accidental Release Measures

6.1 Protective Precautions, Protective Equipment and Emergency Procedures: 
Avoid raising and breathing dust, and provide adequate ventilation.
As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).

6.2 Environmental Precautions:
Take steps to avoid release into the environment, if safe to do so.

6.3 Methods and Material For Containment and Cleaning:
Contain spill and collect, as appropriate.
Transfer to a chemical waste container for disposal in accordance with local regulations.

Section 7. Handling and Storage

7.1 Precautions To Be Taken in Handling:
Avoid breathing dust/fume/gas/mist/vapours/spray.
Avoid prolonged or repeated exposure.

7.2 Precautions To Be Taken in Storing:
Keep container tightly closed.
Store in accordance with information listed on the product insert.

Section 8. Exposure Controls/Personal Protection

8.1 Exposure Parameters:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>Britain EH40</th>
<th>France VL</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>78415-72-2</td>
<td>Milrinone</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>78415-72-2</td>
<td>Milrinone</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

8.2 Exposure Controls:

8.2.1 Engineering Controls (Ventilation etc.): Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

8.2.2 Personal protection equipment:

Eye Protection: Safety glasses
Protective Gloves: Compatible chemical-resistant gloves
Other Protective Clothing: Lab coat
Respiratory Equipment: NIOSH approved respirator, as conditions warrant.

Work/Hygienic/Maintenance Practices: Do not take internally.
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Wash thoroughly after handling.
No data available.
### Section 9. Physical and Chemical Properties

#### 9.1 Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical States</td>
<td>[ ] Gas    [ ] Liquid    [ X ] Solid</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>A crystalline solid</td>
</tr>
<tr>
<td>Melting Point</td>
<td>No data.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>No data.</td>
</tr>
<tr>
<td>Flash Pt</td>
<td>No data.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No data.</td>
</tr>
<tr>
<td>Explosive Limits</td>
<td>LEL: No data.  UEL: No data.</td>
</tr>
<tr>
<td>Vapor Pressure (vs. Air or mm Hg):</td>
<td>No data.</td>
</tr>
<tr>
<td>Vapor Density (vs. Air = 1)</td>
<td>No data.</td>
</tr>
<tr>
<td>Specific Gravity (Water = 1)</td>
<td>No data.</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>No data.</td>
</tr>
<tr>
<td>Solubility Notes</td>
<td>~0.3 mg/ml in DMF &amp; DMSO;</td>
</tr>
<tr>
<td>Autoignition Pt</td>
<td>No data.</td>
</tr>
</tbody>
</table>

#### 9.2 Other Information

- Percent Volatile: No data.
- Molecular Formula & Weight: C12H9N3O  211.2

### Section 10. Stability and Reactivity

#### 10.1 Reactivity:

No data available.

#### 10.2 Stability:

Unstable [ ]  Stable [ X ]

#### 10.3 Stability Note(s):

Stable if stored in accordance with information listed on the product insert.

#### 10.4 Conditions To Avoid:

- Stable oxidizing agents
- Carbon dioxide
- Carbon monoxide
- Nitrogen oxides

#### 10.6 Hazardous - Materials

To Avoid:

- Strong oxidizing agents
- Carbon dioxide
- Carbon monoxide
- Nitrogen oxides

### Section 11. Toxicological Information

#### 11.1 Information on Toxicological Effects:

- Milrinone - Toxicity Data: Oral LD50 (rat): 91 mg/kg; Oral LD50 (mouse): 137 mg/kg; Oral LD50 (rabbit): 40 mg/kg;
- Chronic Toxicological Effects: Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here.

#### 11.2 RTECS Number:

Milrinone RTECS Number: DW1762000

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>NTP</th>
<th>IARC</th>
<th>ACGIH</th>
<th>OSHA</th>
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</thead>
<tbody>
<tr>
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<td>Milrinone</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
Section 12. Ecological Information

12.1 Toxicity: Avoid release into the environment. Runoff from fire control or dilution water may cause pollution.

12.2 Persistence and Degradability: No data available.

12.3 Bioaccumulative Potential: No data available.

12.4 Mobility in Soil: No data available.

12.5 Results of PBT and vPvB assessment: No data available.

Section 13. Disposal Considerations

13.1 Waste Disposal Method: Dispose in accordance with local, state, and federal regulations.

Section 14. Transport Information

14.1 LAND TRANSPORT (US DOT):
DOT Proper Shipping Name: Toxic solid, organic, n.o.s. (Milrinone)
DOT Hazard Class: 6.1 - POISON
UN/NA Number: 2811 Packing Group: III

14.1 LAND TRANSPORT (European ADR/RID):
ADR/RID Shipping Name: Toxic solid, organic, n.o.s. (Milrinone)
UN Number: 2811 Packing Group: III
Hazard Class: 6.1 - POISON

14.3 AIR TRANSPORT (ICAO/IATA):
ICAO/IATA Shipping Name: Toxic solid, organic, n.o.s. (Milrinone)
UN Number: 2811 Packing Group: III
Hazard Class: 6.1 - POISON IATA Classification: 6.1

Additional Transport Information: Transport in accordance with local, state, and federal regulations. When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

Section 15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
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</thead>
<tbody>
<tr>
<td>78415-72-2</td>
<td>Milrinone</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Other US EPA or State Lists</th>
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</thead>
<tbody>
<tr>
<td>78415-72-2</td>
<td>Milrinone</td>
<td>CAA HAP, ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: No</td>
</tr>
</tbody>
</table>

Multi-region format
Section 16. Other Information

Revision Date: 01/15/2015
No data available.

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