1. IDENTIFICATION OF SUBSTANCE/PREPARATION AND THE COMPANY UNDERTAKING

<table>
<thead>
<tr>
<th>Chemical Name:</th>
<th>Oleandrin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code:</td>
<td>MQ26544</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>Neriolin, Corrin, (3b,5b,16b)-16-(Acetyloxy)-3-(2,6-dideoxy-3-O-methyl-a-L-arabino-hexopyranosyl)oxy)-14-hydroxy card-20(22)-enolide.</td>
</tr>
</tbody>
</table>

Recommended uses: For R&D purposes
Supplier: Carbosynth Ltd, 8&9 Old Station Business Park, Compton, Berkshire, RG20 6NE, UK.
Emergency contact numbers: Telephone: +44 (0)1635 578 444
Fax: +44 (0)1635 579 444
Mobile: +44 (0)7887 998 634

2. HAZARDS IDENTIFICATION

Very toxic by inhalation and if swallowed. Danger of cumulative effects.

**Classification:**

Acute toxicity, Oral (Category 2)
Acute toxicity, Inhalation (Category 2)
Specific target organ toxicity - repeated exposure (Category 2)

**Labelling and precautionary statements:**

**Pictogram:**

**Signal word:** Danger.

**Hazard statement(s):**
- H300 Fatal if swallowed.
- H330 Fatal if inhaled.
- H373 May cause damage to organs through prolonged or repeated exposure.

**Precautionary statement(s):**
- P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray .
- P264 Wash skin thoroughly after handling.
- P284 Wear respiratory protection.
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P310 Immediately call a POISON CENTER or doctor/physician.

**Hazard symbol(s):** T+ Very toxic.
MATERIAL SAFETY DATA SHEET
OLEANDRIN

R-phrase(s): R26/28 Very toxic by inhalation and if swallowed.
R33 Danger of cumulative effects.

S-phrase(s): S20/21 When using do not eat, drink or smoke.
S28 After contact with skin, wash immediately with plenty of soap and water.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Molecular Formula:</th>
<th>Molecular weight:</th>
<th>CAS Number:</th>
<th>EINECS Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_{32}H_{48}O_{9}</td>
<td>576.72</td>
<td>465-16-7</td>
<td>207-361-5</td>
</tr>
</tbody>
</table>

Synonyms:
Neriolin,
Corrigen,
(3b,5b,16b)-16-(Acetyloxy)-3-[(2,6-dideoxy-3-O-methyl-a-L-arabino-hexopyranosyl)oxy]-14-hydroxycard-20(22)-enolide.

4. FIRST AID MEASURES

Eye contact: Immediately flush eye with copious amounts of water. Get medical aid immediately.
Skin contact: In case of contact remove contaminated clothing and immediately wash affected areas with copious quantities of water and soap. Get medical aid immediately. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen. Get medical aid.
Ingestion: Never give anything by mouth to an unconscious person. Wash out mouth with water provided person is conscious. Call a physician.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE-FIGHTING MEASURES

Personal precautions: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing media: In case of fire use water spray, dry chemical powder, carbon dioxide, or alcohol-resistant foam.
Special hazards arising from the substance or mixture: Carbon oxides.

6. ACCIDENTAL RELEASE MEASURES

Date of issue: 12 October 2015
Revision Number: 0
Page 2 of
General Information: Use proper personal protective equipment as indicated in Section 8.

Personal precautions: Wear self-contained breathing apparatus, eye protection and gloves. Keep personal hygiene. Avoid contact with skin and eyes. Avoid dust formation. Avoid breathing dust, vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions: Do not let product enter the drains. Prevent further leakage or spillage if safe to do so.

Spills/Leaks: Sweep up and place the material in appropriate container for disposal without creating dust and dispose of as hazardous waste. Ventilate area, clean up spills and wash spill site after material pickup is complete, observing precautions in the Protective Equipment section.

7. HANDLING AND STORAGE

Handling: Wear appropriate protective clothing - see Section 8. Wash thoroughly after handling. Use only under a chemical fume hood. Use with adequate ventilation. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Storage: Store in a cool, dry, well-ventilated area. Keep container tightly closed. Refrigerate. Keep cold. Store at 2-8°C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protection equipment:

Eye protection: Wear appropriate protective safety glasses with side-shields conforming to EN166, chemical safety goggles or face-shield (min. 8-inch) as described by OSHA’s eye and face protection regulations. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection: Wear appropriate protective gloves to prevent skin exposure, as defined in EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body protection: Complete suit protecting against chemicals, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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
Hygiene measures: Use good working practices. Wash hands and face thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White to off-white solid.</td>
</tr>
<tr>
<td>Odour</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>pH</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Melting point</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Flammability</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Data not available/does not apply.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Data not available/does not apply.</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Stable under recommended storage conditions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Data not available.</td>
</tr>
<tr>
<td>Incompatibilities with other materials</td>
<td>Data not available.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides.</td>
</tr>
<tr>
<td>Hazardous polymerization</td>
<td>Data not available.</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTCs #:</td>
<td>FH4585000.</td>
</tr>
<tr>
<td>Acute toxicity</td>
<td>LD50 Intravenous: cat: 0.248 mg/kg.</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Data not available.</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Data not available.</td>
</tr>
</tbody>
</table>
Respiratory or skin sensitization: Data not available.

Germ cell mutagenicity: Data not available.

Carcinogenicity: 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: Data not available.

Specific target organ toxicity - single exposure: Data not available.

Specific target organ toxicity - repeated exposure: May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard: Data not available.

Signs and symptoms of exposure: A cardiac glycoside with effects similar to digitalis. Effects due to ingestion may include: heartburn, gastrointestinal disturbance.

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

Target organs: Data not available.

Potential health effects:
Eye: May cause eye irritation.
Skin: May be harmful by skin absorption.
      May cause skin irritation.
Ingestion: Fatal if swallowed.
Inhalation: Fatal if inhaled.
Chronic: May cause respiratory tract irritation.
No information found.

12. ECOLOGICAL INFORMATION

Data not available.

13. DISPOSAL CONSIDERATIONS

Observe all federal, state and local environmental regulations. Mix or dissolve the material in a combustible solvent and burn in chemical incinerator equipped with an afterburner and scrubber. Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORT INFORMATION
This product is classified as hazardous for transport.

**ADR/RID**
Proper Shipping Name: TOXIC SOLID, ORGANIC, N.O.S. (Oleandrin)
UN Number: 2811
Class: 6.1
Packing Group: II
Environmental hazards: No.

**IMDG**
Proper Shipping Name: TOXIC SOLID, ORGANIC, N.O.S. (Oleandrin)
UN Number: 2811
Class: 6.1
Packing Group: II
Marine pollutant: No.

**IATA**
Proper Shipping Name: TOXIC SOLID, ORGANIC, N.O.S. (Oleandrin)
UN Number: 2811
Class: 6.1
Packing Group: II
Environmental hazards: No.

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15. **REGULATORY INFORMATION**

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

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16. **ADDITIONAL INFORMATION**

Further information on PPE:
European Standard & performance category markings:

- **EN143** - Particulates filter.
- **EN166** - Standard applicable to all types of personal eye protectors.
- **EN374** - Protects hands against chemicals and/or microorganisms.

The information provided in this 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.