SAFETY DATA SHEET
Haloperidol

according to Regulation (EC) No. 1907/2006 as amended by (EC) No. 1272/2008

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

1.1 Product Code: 12014
Product Name: Haloperidol
Synonyms: 4-[4-(4-chlorophenyl)-4-hydroxy-1-piperidinyl]-1-(4-fluorophenyl)-1-butanone; Brotopon; Dozic; Einalon S; Keselan; McN-JR 1625; NSC 170973; NSC 615296; Peluces; R 1625; Serenace;

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: Oral, Category 3
Skin Corrosion/Irritation, Category 2
Serious Eye Damage/Eye Irritation, Category 2A
Skin Sensitization, Category 1
Toxic To Reproduction, Category 2
Target Organ Systemic Toxicity (single exposure), Category 3
Aquatic Toxicity (Chronic), Category 2

2.1.2 Classification according to Directive 1999/45/EC:
T: Toxic
N: Dangerous for the environment
Reproductive Hazard: 3
Risk Phrases: R25, R36/37/38, R43, R50/53, R62
For full text of R-phrases: see SECTION 15.

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

GHS Signal Word: Danger
GHS Hazard Phrases:
H301: Toxic if swallowed.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H317: May cause an allergic skin reaction.
H361: Suspected of damaging fertility or the unborn child.
H335: May cause respiratory irritation.
H411: Toxic to aquatic life with long lasting effects.
GHS Precaution Phrases:
P264: Wash {hands} thoroughly after handling.
P280: Wear {protective gloves/protective clothing/eye protection/face protection}.
P362+364: Take off contaminated clothing and wash it before reuse.
P261: Avoid breathing {dust/fume/gas/mist/vapours/spray}.
P272: Contaminated work clothing should not be allowed out of the workplace.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P281: Use personal protective equipment as required.
P273: Avoid release to the environment.

GHS Response Phrases:
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P330: Rinse mouth.
P302+352: IF ON SKIN: Wash with plenty of soap and water.
P332+313: If skin irritation occurs, get medical advice/attention.
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+313: If eye irritation persists, get medical advice/attention.
P333+313: If skin irritation or rash occurs, seek medical advice/attention.
P308+313: IF exposed or concerned: Get medical attention/advice.
P309+311: Call a POISON CENTER or doctor/physician if exposed or you feel unwell.
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P391: Collect spillage.

GHS Storage and Disposal Phrases:
Please refer to Section 7 for Storage and Section 13 for Disposal information.

2.2.2 Labeling according to Directive 1999/45/EC:

Reproductive Hazard: 3

2.3 Adverse Human Health Causes skin irritation.

Effects and Symptoms:
Material may be irritating to the mucous membranes and upper respiratory tract. May be harmful by inhalation, ingestion, or skin absorption. May cause an allergic skin reaction. May cause respiratory irritation. Suspected of damaging fertility or the unborn child. Toxic if swallowed. Toxic to aquatic life with long lasting effects.

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>Risk Phrases/GHS Classification</th>
</tr>
</thead>
</table>
Section 4. First Aid Measures

4.1 Description of First Aid Measures:

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.

Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.

Unsuitable Extinguishing Media: Use water spray to cool fire-exposed containers.

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 Up: 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.

7.2 Precautions To Be Taken in Storing: Avoid prolonged or repeated exposure.

Keep container tightly closed.

Store in accordance with information listed on the product insert.
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>
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<tbody>
<tr>
<td>52-86-8</td>
<td>Haloperidol</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
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</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
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<tbody>
<tr>
<td>52-86-8</td>
<td>Haloperidol</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: 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 and a safety shower.
- Wash thoroughly after handling.

9.1 Information on Basic Physical and Chemical Properties

- **Physical States:** [ ] Gas [ ] Liquid [X] Solid
- **Appearance and Odor:** A crystalline solid
- **Melting Point:** No data.
- **Boiling Point:** No data.
- **Flash Pt:** No data.
- **Evaporation Rate:** No data.
- **Explosive Limits:** LEL: No data. UEL: No data.
- **Vapor Pressure (vs. Air or mm Hg):** No data.
- **Vapor Density (vs. Air = 1):** No data.
- **Specific Gravity (Water = 1):** No data.
- **Solubility in Water:** No data.
- **Solubility Notes:** ~0.5 mg/ml in 1:1 DMF:PBS (pH 7.2); ~5 mg/ml in EtOH; ~14 mg/ml in DMSO; ~20 mg/ml in DMF;
- **Autoignition Pt:** No data.
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9.2 Other Information
Percent Volatile: No data.
Molecular Formula & Weight: C21H23ClFNO2 375.9

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.
Polymerization: Will occur [ ] Will not occur [ X ]
10.4 Conditions To Avoid: No data available.
10.5 Incompatibility - Materials To Avoid: strong oxidizing agents
10.6 Hazardous Decomposition Or Byproducts: carbon dioxide
carbon monoxide
hydrogen chloride gas
hydrogen fluoride
nitrogen oxides

Section 11. Toxicological Information

11.1 Information on Toxicological Effects: The toxicological effects of this product have not been thoroughly studied.
Haloperidol - Toxic Data: Oral TDLO (child): 72 µg/kg; Oral TDLO (human): 71 µg/kg; Oral LD50 (rat): 128 mg/kg; Oral LD50 (mouse): 71 mg/kg; Subcutaneous LD50 (rat): 60 mg/kg; Subcutaneous LD50 (mouse): 41 mg/kg; Intravenous LD50 (rat): 15 mg/kg; Intravenous LD50 (mouse): 13 mg/kg; Intravenous LD50 (rabbit): 8 mg/kg; Oral TDLO (man): 71.4 µg/kg; Oral TDLO (rat): 0.15 mg/kg; Oral TDLO (mouse): 140 µg/kg;
Chronic Toxicological Effects: Haloperidol - Investigated as a mutagen, reproductive effector, and tumorigen.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

Section 12. Ecological Information

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

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 solids, organic, n.o.s. (Haloperidol)
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 solids, organic, n.o.s. (Haloperidol)
UN Number: 2811
Hazard Class: 6.1 - POISON
Packing Group: III

14.3 AIR TRANSPORT (ICAO/IATA):

ICAO/IATA Shipping Name: Toxic solids, organic, n.o.s. (Haloperidol)
UN Number: 2811
Hazard Class: 6.1
Packing Group: III
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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<tbody>
<tr>
<td>52-86-8</td>
<td>Haloperidol</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tbody>
</table>

Other US EPA or State Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Other US EPA or State Lists</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-86-8</td>
<td>Haloperidol</td>
<td>CAA HAP, ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: Yes</td>
</tr>
</tbody>
</table>

European Community Hazard Symbol codes:

Reproductive Hazard: 3

European Community Risk and Safety Phrases:

R25  Toxic if swallowed.
R36/37/38  Irritating to eyes, respiratory system and skin.
R43  May cause sensitization by skin contact.
R50/53  Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R62  Risk of impaired fertility.
S22  Do not breathe dust.
S24/25  Avoid contact with skin and eyes.
S36/37/39  Wear suitable protective clothing, gloves and eye/face protection.
S45  In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)

Regulatory Information Statement: This SDS was prepared in accordance with Regulation (EC) No.1272/2008 and European Directive 67/548/EEC as amended.
**Section 16. Other Information**

<table>
<thead>
<tr>
<th>Revision Date:</th>
<th>11/27/2013</th>
</tr>
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<tbody>
<tr>
<td><strong>Additional Information About This Product:</strong></td>
<td>No data available.</td>
</tr>
<tr>
<td><strong>Company Policy or Disclaimer:</strong></td>
<td>DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.</td>
</tr>
</tbody>
</table>

N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required