1. PRODUCT AND COMPANY IDENTIFICATION

Chemical Name: Nalfurafine Hydrochloride

Catalogue #: N255600

Company: Toronto Research Chemicals
2 Brisbane Road
Toronto, ON  M3J 2J8
CANADA

Telephone: +14166659696
FAX: +14166654439
Emergency#: +14166659696
Email: orders@trc-canada.com

2. HAZARDS IDENTIFICATION

WHMIS Classification
D1B                  Toxic Material Causing Immediate and Serious Toxic Effects
Toxic by ingestion

HMIS Classification
Health hazard: 2
Flammability: 0
Physical hazards: 0

Potential Health Effects
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
Ingestion: Harmful if swallowed.

GHS Classification
Acute toxicity, Oral (Category 4)

GHS Label elements, including precautionary statements
Signal word: Danger

Hazard statement(s)
H302                  Harmful if swallowed.
Precautionary statement(s)
P301/P310              IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

GHS Label Pictogram

3. COMPOSITION/INFORMATION ON INGREDIENTS

Molecular Formula: C_{28}H_{33}ClN_{2}O_{5}

Toronto Research Chemicals - N255600
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. FIRE FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust or aerosol formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Environmental precautions
Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). 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 or aerosols. Provide appropriate exhaust ventilation at places where dust/aerosol is formed. Normal measures for preventative fire protection.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Store at -20°C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Molecular Weight: 513.03
CAS Registry #: 152658-17-8
EC#: (2E)-N-[(5α,6β)-17-(Cyclopropylmethyl)-4,5-epoxy-3,14-dihydroxyxymorphinan-6-yl]-3-(3-furanyl)-N-methyl-2-propenamide Hydrochloride; (-)-17-(Cyclopropylmethyl)-3,14β-dihydroxy-4,5α-epoxy-6β-[N-methyl-trans-3-(3-furyl)acrylamido]morphinan Hydrochloride; Remitch; TRK 820;

Synonyms:
Toronto Research Chemicals - N255600
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. 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

Appearance
Off-white solid

Safety data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Boiling point</td>
<td>N/A</td>
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<tr>
<td>Ignition temperature</td>
<td>N/A</td>
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<tr>
<td>Upper explosion limit</td>
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</tr>
<tr>
<td>Density</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting point</td>
<td>&gt;250°C (dec.)</td>
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<tr>
<td>Flash point</td>
<td>N/A</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Water solubility</td>
<td>N/A</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents.

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions: carbon oxides, nitrogen oxides, hydrogen chloride.

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 (oral - male rat)  < 650 mg/kg
LD50 (oral - female rat)  781 mg/kg
LD50 (intramuscular - male rat)  246 mg/kg
LD50 (intramuscular - female rat)  320 mg/kg

Irritation and corrosion

Toronto Research Chemicals - N255600
no data available

**Sensitization**
o no data available

**Carcinogenicity**
IARC: To the best of our knowledge, this compound has not been identified as a possible or potential human carcinogen by IARC.

**Reproductive toxicity**
o no data available

**Potential health effects**

**Inhalation** May be harmful if inhaled. May cause respiratory tract irritation.

**Skin** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

**Ingestion** Harmful if swallowed.

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

**Additional Information**
RTECS: UC6317000

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### 12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Persistence and degradability</th>
<th>Bioaccumulative potential</th>
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</thead>
<tbody>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>no data available</td>
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</table>

<table>
<thead>
<tr>
<th>Mobility in soil</th>
<th>PBT and vPvB assessment</th>
<th>Other adverse effects</th>
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<tbody>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>no data available</td>
</tr>
</tbody>
</table>

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### 13. DISPOSAL CONSIDERATIONS

**Product**
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**
Dispose of as unused product.

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### 14. TRANSPORT INFORMATION

**DOT (US)/IMDG/IATA**
not dangerous goods

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### 15. REGULATORY INFORMATION

**DSL Status**
Product is not on the Canadian DSL or NDSL list.

**WHMIS Classification**
D1B Toxic Material Causing Immediate and Serious Toxic Effects Toxic by ingestion

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### 16. OTHER INFORMATION

**Further information**
Copyright 2010 Toronto Research Chemicals Inc. Copies may be made for internal use only. The above information is believed to be correct to the best of our knowledge, but is not to be deemed as all-inclusive and is to be only used as a guide. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Please take all due care when handling this product.