Nisoldipine

sc-212396

Material Safety Data Sheet

Hazard Alert Code Key: EXTREME HIGH MODERATE LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Nisoldipine

STATEMENT OF HAZARDOUS NATURE

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C20-H24-N2-O6, "isobutyl methyl 2, 6-dimethyl-4-(2-nitrophenyl)-1, 4-dihydropyridine-3, ", 5-dicarboxylate, "1, 4-dihydro-2, 6-dimethyl-4-(2-nitrophenyl)-3, 5-pyridinedicarboxylic", "acid methyl 2-methylpropyl ester", "O5-methyl O3-(2-methylpropyl) 2, 6-dimethyl-4-(2-nitrophenyl)-1, 4-", "dihydropyridine-3, 6-dicarboxylic", "2, 6-dimethyl-3-carboxyethoxy-4-(2-nitrophenyl)-5-carboisobutoxy-1, 4-", "dihydropyridine, "3, 5-pyridinedicarboxylic acid, 1, 4-dihydro-2, 6-dimethyl-4-(2-", "nitrophenyl)-, methyl 2-methyl-propyl ester, ", "Bay-K 5552", Baymaycard, Norvasc, Sular, Syscor, Zadipina, antihypertensive, antianginal

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
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<tbody>
<tr>
<td>Flammability:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Toxicity:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Body Contact:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Reactivity:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chronic:</td>
<td>2</td>
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</table>

CANADIAN WHMIS SYMBOLS
EMERGENCY OVERVIEW

RISK
Possible risk of harm to the unborn child. Harmful by inhalation, in contact with skin and if swallowed.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- Large doses of calcium channel blocking agents may produce nausea, weakness, dizziness, drowsiness, confusion, slurred speech, a decrease in blood pressure along with reduced cardiac output; death may ensue.

EYE
- Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.

SKIN
- Skin contact with the material may be harmful; systemic effects may result following absorption.
- The material is not thought to be a skin irritant (as classified using animal models). Abrasive damage however, may result from prolonged exposures.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
- Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.
- The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS
- Results in experiments suggest that this material may cause disorders in the development of the embryo or fetus, even when no signs of poisoning show in the mother.
- Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
- Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Calcium channel blocking agents can cause heart irregular heart beat, high blood pressure, vomiting, diarrhea, headache, dermatitis, acne, itching and blood disorders such as anemia and loss of platelets. Widespread blood swellings and blood clots may occur.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>nisolidipine</td>
<td>63675-72-9</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED
- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. - Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE
- If this product comes in contact with the eyes: - Wash out immediately with fresh running water. - Ensure complete irritation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
- If skin contact occurs: - Immediately remove all contaminated clothing, including footwear - Flush skin and hair with running water (and soap if available).

INHALED
If fumes or combustion products are inhaled remove from contaminated area. Lay patient down. Keep warm and rested.

**NOTES TO PHYSICIAN**

- The highly lipophilic characteristics, high protein binding and extensive volume of distribution of calcium channel blockers makes hemodialysis, diuresis, and hemoperfusion impractical. Calcium gluconate has been used successfully to reverse hypotension.

There is no experience with nisoldipine overdosage. Generally, overdosage with other dihydropyridines leading to pronounced hypotension calls for active cardiovascular support including monitoring of cardiovascular and respiratory function, elevation of extremities, judicious use of calcium infusion, pressor agents and fluids. Clearance of nisoldipine would be expected to be slowed in patients with impaired liver function. Since nisoldipine is highly protein bound, dialysis is not likely to be of any benefit; however, plasmapheresis may be beneficial. Nisoldipine is highly metabolized; 5 major urinary metabolites have been identified. Although 60 - 80% of an oral dose undergoes urinary excretion, only traces of unchanged nisoldipine are found in urine.

### Section 5 - FIRE FIGHTING MEASURES

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<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Vapour Pressure (mmHg)</td>
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</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
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</tr>
<tr>
<td>Specific Gravity (water=1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**EXTINGUISHING MEDIA**

- Foam.
- Dry chemical powder.

**FIRE FIGHTING**

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.

**FIRE INCOMPATIBILITY**

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

**PERSONAL PROTECTION**

- Glasses: Chemical goggles.
- Gloves: Particulate
- Respirator: Particulate

### Section 6 - ACCIDENTAL RELEASE MEASURES

**MINOR SPILLS**

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

**MAJOR SPILLS**

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

### Section 7 - HANDLING AND STORAGE

**PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

**RECOMMENDED STORAGE METHODS**
- Glass container.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE REQUIREMENTS**
- Store in original containers.
- Keep containers securely sealed.

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**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE CONTROLS**
The following materials had no OELs on our records
- nisolidipine: CAS:63675-72-9

**PERSONAL PROTECTION**

**RESPIRATOR**
Particulate
Consult your EHS staff for recommendations

**EYE**
- When handling very small quantities of the material eye protection may not be required.
- For laboratory, larger scale or bulk handling or where regular exposure in an occupational setting occurs:
  - Chemical goggles
  - Face shield. Full face shield may be required for supplementary but never for primary protection of eyes
  - Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

**HANDS/FEET**
- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
  - frequency and duration of contact,
  - chemical resistance of glove material,
  - glove thickness and
  - dexterity
- Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
  - When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
  - When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.
- Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
  - Rubber gloves (nitrite or low-protein, powder-free latex). Employees allergic to latex gloves should use nitrile gloves in preference.
  - Double gloving should be considered.
  - PVC gloves.
  - Protective shoe covers.
  - Head covering.
- Experience indicates that the following polymers are suitable as glove materials for protection against undisolved, dry solids, where abrasive particles are not present.
  - polychloroprene
  - nitrile rubber
  - butyl rubber
  - fluorocautchouc
  - polyvinyl chloride
- Gloves should be examined for wear and/ or degradation constantly.

**OTHER**
- For quantities up to 500 grams a laboratory coat may be suitable.
- For quantities up to 1 kilogram a disposable laboratory coat or coverall of low permeability is recommended. Coveralls should be buttoned
at collar and cuffs.

· For quantities over 1 kilogram and manufacturing operations, wear disposable coverall of low permeability and disposable shoe covers.
· For manufacturing operations, air-supplied full body suits may be required for the provision of advanced respiratory protection.
· Eye wash unit.
· Ensure there is ready access to an emergency shower.
· For Emergencies: Vinyl suit.

ENGINEERING CONTROLS

Enclosed local exhaust ventilation is required at points of dust, fume or vapor generation.

HEPA terminated local exhaust ventilation should be considered at point of generation of dust, fumes or vapors.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

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<tr>
<th>State</th>
<th>Divided Solid</th>
<th>Molecular Weight</th>
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<tbody>
<tr>
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<td>303.8- 305.6</td>
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<td>Boiling Range (*F)</td>
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<td>pH (1% solution)</td>
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<tr>
<td>Decomposition Temp (*F)</td>
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<td>pH (as supplied)</td>
<td>Not Applicable</td>
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<tr>
<td>Autoignition Temp (*F)</td>
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<td>Vapour Pressure (mmHG)</td>
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<tr>
<td>Upper Explosive Limit (%)</td>
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<td>Specific Gravity (water=1)</td>
<td>Not Available</td>
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<td>Lower Explosive Limit (%)</td>
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<td>Relative Vapor Density (air=1)</td>
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APPEARANCE

Yellow crystalline solid; does not mix well with water. Soluble in ethanol.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Presence of incompatible materials.
· Product is considered stable.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

NISOLIDIPINE

TOXICITY AND IRRITATION

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

<table>
<thead>
<tr>
<th>TOXICITY</th>
<th>IRRITATION</th>
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<tr>
<td>Oral (Rat) LD50: 1257 mg/kg</td>
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<tr>
<td>Subcutaneous (Rat) LD50: 674 mg/kg</td>
<td></td>
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<tr>
<td>Intravenous (Rat) LD50: 1.12 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Oral (Mouse) LD50: 411 mg/kg</td>
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</tr>
<tr>
<td>Subcutaneous (Mouse) LD50: 384 mg/kg</td>
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<tr>
<td>Intravenous (Mouse) LD50: 0.36 mg/kg</td>
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<tr>
<td>Oral (Dog) LD50: 400 mg/kg</td>
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<tr>
<td>Intravenous (Dog) LD50: 2 mg/kg</td>
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<tr>
<td>Intravenous (Rabbit) LD50: 2.5 mg/kg</td>
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</table>

Carcinogenesis, Mutagenesis, Impairment of Fertility: Dietary administration of nisoldipine to male and female rats for up to 24 months (mean doses up to 82 and 111 mg/kg/day, 16 and 19 times the maximum recommended human dose (MRHD) on a mg/m² basis, respectively) and female mice for up to 21 months (mean doses of up to 217 mg/kg/day, 20 times the MRHD on a mg/m² basis) revealed no evidence of tumorigenic effect of nisoldipine. In male mice receiving a mean dose of 163 mg nisoldipine/kg/day (16 times the MRHD of 60 mg/kg on a mg/m² basis), an increased frequency of stomach papilloma, but still within the historical range, was observed. No evidence of stomach neoplasia was observed at lower doses (up to 58 mg/kg/day). Nisoldipine was negative when tested in a battery of genotoxicity assays including the Ames test and the
CHO/HGRPT assay for mutagenicity and the in vivo mouse micronucleus test and in vitro CHO cell test for clastogenicity. When administered to male and female rats at doses of up to 30 mg/kg/day (about 5 times the MRHD on a mg/m² basis) nisoldipine had no effect on fertility.

Nisoldipine was neither teratogenic nor foetotoxic at doses that were not maternally toxic. Nisoldipine was fetotoxic but not teratogenic in rats and rabbits at doses resulting in maternal toxicity (reduced maternal body weight gain). In pregnant rats, increased fetal resorption (postimplantation loss) was observed at 100 mg/kg/day and decreased fetal weight was observed at both 30 and 100 mg/kg/day. These doses are, respectively, about 5 and 16 times the MRHD when compared on a mg/m² basis. In pregnant rabbits, decreased fetal and placental weights were observed at a dose of 30 mg/kg/day, about 10 times the MRHD when compared on a mg/m² basis. In a study in which pregnant monkeys (both treated and control) had high rates of abortion and mortality, the only surviving foetus from a group exposed to a maternal dose of 100 mg nisoldipine/kg/day (about 30 times the MRHD when compared on a mg/m² basis) presented with forelimb and vertebral abnormalities not previously seen in control monkeys of the same strain.

Section 12 - ECOLOGICAL INFORMATION

No data

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<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
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<tbody>
<tr>
<td>nisoldipine</td>
<td>HIGH</td>
<td>LOW</td>
<td>LOW</td>
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</tr>
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Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

No data for nisoldipine (CAS: , 63675-72-9)

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE
- Cumulative effects may result following exposure*.
  * (limited evidence).

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no
Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.