Material Safety Data Sheet

Glyceryl 1,3-distearate

sc-215081

Hazard Alert Code Key: EXTREME HIGH MODERATE LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Glyceryl 1,3-distearate

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
C39-H76-O5, "1, 3-distearoylglycerol", "1, 3-dioctadecanoylglycerol", "1, 3-distearin (C18:0)"

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>
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<td></td>
</tr>
<tr>
<td>Body Contact</td>
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<td></td>
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<tr>
<td>Reactivity</td>
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<td></td>
</tr>
<tr>
<td>Chronic</td>
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</table>

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW
RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
- The material has NOT been classified as “harmful by ingestion”.
- This is because of the lack of corroborating animal or human evidence.
- Use in food, and as food additive indicates high degree of tolerance.
- Bulk laxatives can cause temporary bloating and blockage of the esophagus and/or intestine.
- As they shorten the time of digestion, the absorption of other drugs will be affected.

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
- The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models).
- Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the bloodstream, 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
- The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models).
- Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate matter are inhaled.
- Inhalation hazard is increased at higher temperatures.
- Inhalation of oil droplets/aerosols may cause discomfort and may produce chemical pneumonitis.
- Fine mists generated from plant/vegetable (or more rarely from animal) oils may be hazardous.
- Extreme heating for prolonged periods, at high temperatures, may generate breakdown products which include acrolein and acrolein-like substances.

CHRONIC HEALTH EFFECTS
- There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.
- 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.
- Synthetic 1,2-diacylglycerides of short chain (C6, C8, C10) fatty acids are activators of protein kinase C (PKC). PKC is a serine-threonine kinase which also requires calcium ion for its activation. Activated PKC phosphorylates proteins of the cellular signal cascade, which eventually induce expression of growth regulatory genes. This, in turn, may promote the growth of tumours. Structural analogues of the 1,2-diacylglycerides, such as the phorbol esters, have been shown to strongly promote such an event.
- Glycerol dilaurate, glycerol diarachidate, glycerol dibehenate, glycerol diarachidate, glycerol distearate, glycerol dipalmitate, glycerol distearate, glycerol palmate lactate, glycerol steartate citrate, glycerol steartate lactate, and glycerol steartate succinate are diacylglycerols (also known as diglycerides or glycerol diesters) that function as skin conditioning agents-emollients in cosmetics. Only glycerol dilaurate (up to 5%), glycerol disostearate (up to 43%), glycerol dioleate (up to 2%), glycerol distearate (up to 7%), and glycerol steartate lactate (up to 5%) are reported to be in current use. Production proceeds from fully refined vegetable oils, which are further processed using hydrogenation and fractionation techniques, and the end products are produced by reading selected mixtures of the partly hydrogenated, partly fractionated oils and fats with vegetable-derived glycerine to yield partial glycerides. In the final stage of the production process, the products are purified by deodorization, which effectively removes pesticide residues and lower boiling residues such as residues of halogenated solvents and aromatic solvents. Diglycerides have been approved by the Food and Drug Administration (FDA) for use as indirect food additives. Namely, these ingredients are 1,3-diglycerides, but are easily isomerised to the 1,2-diglyceride form. The 1,2-diacylglyceride isomer is not a significant toxicant in acute, short-term, subchronic, or chronic animal tests. Glycerol dilaurate was a mild primary irritant in albino rabbits, but not a skin sensitiser in guinea pig maximization tests. Diacylglycerol oil was not genotoxic in the Ames test, in mammalian Chinese hamster lung cells, or in a rodent bone marrow micronucleus assay. An eye shadow containing 1.5% glycerol dilaurate did not induce skin irritation in a single insult patch test, but mild skin irritation reactions to a foundation containing the same concentration were observed. A trade mixture containing an unspecified concentration of glycerol dibeheinate did not induce irritation or significant cutaneous intolerance in a 48-h occlusive patch test. In maximization tests, neither an eye shadow nor a foundation containing 1.5% glycerol dilaurate was a skin sensitiser. Sensitisation was not induced in subjects patch tested with 50% w/w glycerol dioleate in a repeated insult, occlusive patch test. Glycerol palmitate lactate (50% w/v) did not induce skin irritation or sensitisation in subjects patch tested in a repeat-insult patch test. Phototoxicity or photoallergenicity was not induced in healthy volunteers treated with a lipstick containing 1.0% Glycerol rosinate. Two diacylglycerols, 1-oleoyl-2-acetoyl-sn-glycerol and 1,2-dipalmitoyl-sn-glycerol, did not alter cell proliferation (as determined by DNA synthesis) in normal human dermal fibroblasts in vitro at doses up to 10 μg/ml. In the absence of initiation, Glycerol dilaurate induced a moderate hyperplastic response in randomly bred mice of a tumor-resistant strain, and with 9,10-dimethyl-1,2-benzanthracene (DMBA) initiation, an increase in the total cell count was observed. In a glycerol monooester study, a single application of DMBA to the skin followed by 5% glycerol steartate weekly produced no tumors, but slight epidermal hyperplasia at the site of application. Glycerol dioleate induced transformation in 3-methylcholanthrene-initiated BALB/3T3 A31-1-1 cloned cells in vitro. A tumour-promoting dosing regimen that consisted of multiple applications of 10 μmol of a 1,2-diacylglycerol (sn-1,2-didecanoylglycerol) to female mice twice daily for 1 week caused more than a 60% decrease in protein kinase C (PKC) activity and marked epidermal hyperplasia. Application of 10 μmol sn-1,2-didecanoylglycerol twice weekly for 1 week caused a decrease in cytosolic PKC activity, an increase in particulate PKC activity, and no epidermal hyperplasia. In studies of the tumour-promoting activity of 1,2-diacylglycerols, dose and the exposure regimen by which the dose is delivered play a role in tumor promotion. The 1,2-diacylglycerol–induced activation of PKC may also...
relate to the saturation of the fatty acid in the 1 or 2 position; 1,2-Diacylglycerols with two saturated fatty acids are less effective. Also, the activity of 1,2-diacylglycerols may be reduced when the fatty acid moiety in the structure is a long-chain fatty acid. A histological evaluation was performed on human skin from female volunteers (18 to 56 years old) who had applied a prototype lotion or placebo formulation, both containing 0.5% Glycerol Dilaurate, consecutively for 16 weeks or 21 weeks. Skin irritation was not observed in any of the subjects tested. Biopsies (2 mm) taken from both legs of five subjects indicated no recognizable abnormalities of the skin; the epidermis was normal in thickness, and there was no evidence of scaling, inflammation, or neoplasms in any of the tissues that were evaluated. The available safety test data indicate that diglycerides in the 1,3-diester form do not present any significant acute toxicity risk, nor are these ingredients irritating, sensitizing, or photosensitising. Whereas no data are available regarding reproductive or developmental toxicity, there is no reason to suspect any such toxicity because the dermal absorption of these chemicals is negligible. 1,3-Diglycerides contain 1,2-diglycerides, raising the concern that 1,2-diglycerides could potentially induce hyperplasia. Data regarding the induction of PKC and the tumour promotion potential of 1,2-diacylglycerols increases the level of concern. Most of the diglycerides considered above, however, have fatty acid chains longer than 14 carbons and none have mixed saturated/unsaturated fatty acid moieties. In a 21-week use study of a prototype lotion containing 0.5% glyceryl dilaurate (a 14-carbon chain fatty acid) indicated no evidence of scaling, inflammation, or neoplasms in biopsy specimens. Also, DNA synthesis assays on glyceryl dilaurate and glyceryl distearate indicated that neither chemical altered cell proliferation (as determined by DNA synthesis) in normal human dermal fibroblasts in vitro at doses up to 10 µg/ml. However the concentration of these ingredients can vary (up to 43% for glyceryl disostearate in lipstick), the frequency of application can be several times daily, and the proportion of diglycerides that are inactive 1,3 isomers versus potentially biologically active 1,2 isomers is unknown; as a precaution it is believed that each use should be examined to ensure the absence of epidermal hyperplasia during product development and testing. In the absence of inhalation toxicity data on the glyceryl diesters it is thought that these ingredients can be used safely in aerosolised products because they are not respirable. Although there are gaps in knowledge about product use, the overall information available on the types of products in which these ingredients are used and at what concentration indicate a pattern of use. Within this overall pattern of use, the CIR Expert Panel considers all ingredients in this group to be safe. International Journal of Toxicology, Vol. 26, No. 3 Suppl, 1-30 (2007).

Glycerol esters occur throughout nature and make up part of the normal diet.

### 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>glyceryl 1,3-distearate</td>
<td>504-40-5</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

### Section 4 - FIRST AID MEASURES

**SWALLOWED**
- Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

**EYE**
- If this product comes in contact with eyes: · Wash out immediately with water. · If irritation continues, seek medical attention.

**SKIN**
- If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

**INHALED**
- If fumes or combustion products are inhaled remove from contaminated area. · Other measures are usually unnecessary.

**NOTES TO PHYSICIAN**
- Treat symptomatically.

### Section 5 - FIRE FIGHTING MEASURES

**Vapour Pressure (mmHG):** Negligible
**Upper Explosive Limit (%):** Not available
**Specific Gravity (water=1):** 0.98
**Lower Explosive Limit (%):** Not available

**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 other debris of ignition, i.e. flame or sparks. 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), acrolein, other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

CARE: Water in contact with hot liquid may cause foaming and a steam explosion with wide scattering of hot oil and possible severe burns. Foaming may cause overflow of containers and may result in possible fire.
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: 
- Respirator: Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
- Clean up all spills immediately.
- Avoid breathing dust and contact with skin and eyes.

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
- Rags wet / soaked with unsaturated hydrocarbons / drying oils may auto-oxidise; generate heat and, in-time, smoulder and ignite. This is especially the case where oil-soaked materials are folded, bunched, compressed, or piled together - this allows the heat to accumulate or even accelerate the reaction.
- Oily cleaning rags should be collected regularly and immersed in water, or spread to dry in safe-place away from direct sunlight or stored, immersed, in solvents in suitably closed containers.
- 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
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

STORAGE REQUIREMENTS
- Store at -20° C.
- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS
The following materials had no OELs on our records
- glyceryl 1,3-distearate: CAS:504-40-5

PERSONAL PROTECTION

RESPIRATOR
- Particulate

EYE
- Safety glasses with side shields
- Chemical goggles

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.
· Protective gloves eg. Leather gloves or gloves with Leather facing.
Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.
· polychloroprene
· nitrile rubber
· butyl rubber
· fluorocarouche
· polyvinyl chloride
Gloves should be examined for wear and/or degradation constantly.
OTHER
· Overalls.
· P.V.C. apron.
· Barrier cream.
· Skin cleansing cream.
· Eye wash unit.

ENGINEERING CONTROLS
· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

**PHYSICAL PROPERTIES**
Solid.
Does not mix with water.
Floats on water.

<table>
<thead>
<tr>
<th>State</th>
<th>Divided solid</th>
<th>Molecular Weight</th>
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<tbody>
<tr>
<td>Melting Range (°F)</td>
<td>162- 165</td>
<td>Viscosity</td>
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<tr>
<td>Boiling Range (°F)</td>
<td>Not available</td>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
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<td>Flash Point (°F)</td>
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<td>pH (1% solution)</td>
<td>Not applicable</td>
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<td>pH (as supplied)</td>
<td>Not applicable</td>
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<td>Autoignition Temp (°F)</td>
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<td>Vapour Pressure (mmHG)</td>
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<td>Upper Explosive Limit (%)</td>
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<td>Specific Gravity (water=1)</td>
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<tr>
<td>Lower Explosive Limit (%)</td>
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<td>Relative Vapor Density (air=1)</td>
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<tr>
<td>Volatile Component (%vol)</td>
<td>Negligible</td>
<td>Evaporation Rate</td>
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</table>

**APPEARANCE**
White, cream coloured, waxy solid beads or flakes; insoluble in water. Faint fatty odor and oily taste. Soluble in hot alcohol, benzene, ether, acetone, mineral or fixed oils. May be readily emulsified in water.

**Section 10 - CHEMICAL STABILITY**

**CONDITIONS CONTRIBUTING TO INSTABILITY**
· Presence of incompatible materials.
· Product is considered stable.

**STORAGE INCOMPATIBILITY**
· Materials soaked with plant/vegetable derived (and rarely, animal) oils may undergo spontaneous combustion.
Food grade materials must be protected from all possible contaminants.
Avoid reaction with oxidizing agents.
For incompatible materials - refer to Section 7 - Handling and Storage.

**Section 11 - TOXICOLOGICAL INFORMATION**
glycerol 1,3-distearate
Section 12 - ECOLOGICAL INFORMATION

No data

<table>
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<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
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<td>LOW</td>
<td>No Data Available</td>
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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

glyceryl 1,3-distearate (CAS: 504-40-5) is found on the following regulatory lists:
"US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE
■ Limited evidence of a carcinogenic effect*.
* (limited evidence).

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For additional technical information please call our toxicology department on +800 CHEMCALL.

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.

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