Indinavir Sulfate

sc-207755

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Indinavir Sulfate

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

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
C36H49N5O8S, "[1-(1S, 2R), 5(S)]-2, 3, 5-trideoxy-N-(2, 3-dihydro-2-hydroxy-1H-", "inden-1-yl)-5-[((1, 1-dimethylethyl)amino)carbonyl]-4-(3-", pyridinylmethyl)-1-piperazinyl-2-(phenylmethyl)-D-erythropentonamide, sulfate, "HIV-1 protease inhibitor AIDS treatment", MK-0639, "L-735, 524", "Crixivan (the ethanolate)", antiviral

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	2		
Body Contact:	2		
Reactivity:	0		
Chronic:	2		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Irritating to eyes.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Although ingestion is not thought to produce harmful effects, the material may still be damaging to the health of the individual following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident.
<\p>.
■ Considered an unlikely route of entry in commercial/industrial environments.
■ Common side effects of treatment with HIV-I protease inhibitors (PI) include diarrhoea, nausea, vomiting, gastrointestinal discomfort, headache, asthenia, fatigue and taste disturbances. Renal calculi (nephrolithiasis) are seen on occasion. Patients receiving highly active antiretroviral therapy (HAART), generally a combination of reverse transcriptase and protease inhibitors, frequently develop lipodystrophy with elevated levels of serum cortisol, lowered levels of serum DHEA (dehydroepiandrosterone) and increased levels of atherogenic lipids (important in the pathogenesis of arteriosclerosis). In one study researchers have also identified lipid abnormalities associated with coronary heart disease, along with alterations in glucose and insulin metabolism amongst patients undergoing HAART. A substantial percentage (71%) of PI-treated patients had hyperlipidaemia compared with only 24% of PI-naive patients. Amongst PI-treated patients, 44% had isolated hypertriglyceridaemia, 7% had type V hyperlipidaemia, 37% had type IV hyperlipidaemia, 36% type IIb hyperlipidaemia, and 18% had isolated hypercholesterolaemia. Fat redistribution and metabolic abnormalities are commonly seen in patients undergoing PI therapies. Up to 83% of individuals taking PIs develop excess belly fat and skinnier arms, legs and faces. A further study found that subcutaneous fat wasting developed in 54% of PI-treated patients compared with 13% of PI-naive patients. The rate of progression to fat wasting was significantly increased with advancing age and white race; earlier therapy with reverse transcription inhibitors also produced an accelerated effect. Another study, however, questions the subjective analysis of such findings and proposes that fat depletion (lipoatrophy/ lipodystrophy) and redistribution does not occur in HIV-therapy. There is support for the idea that changes in lipid and glucose metabolism, after initiation of PI therapy, are a result of central fat accumulation, per se, as central fat accumulation has been postulated to induce glucose intolerance and hyperlipidaemia in HIV-negative populations. PI-treatment has been associated with a higher rate of diabetes mellitus, impaired glucose tolerance, hyperinsulinaemia and early hypersecretion of proinsulin. A pilot study found that 46% of HIV-infected patients receiving PIs had impaired glucose intolerance, a predictor of future diabetes development. PI-treated patients had a higher and prolonged output of insulin during the [oral glucose tolerance test - OGTT] with delayed peak concentrations in the second phase of the test. In contrast, PI-naive patients responded with rapid insulin release in the first phase of OGTT after glucose ingestion.

EYE

■ This material can cause eye irritation and damage in some persons.
■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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.

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 are inhaled.

CHRONIC HEALTH EFFECTS

■ Principal routes of exposure are usually by skin contact/absorption and inhalation of generated dust.
In repeat-dose oral toxicity studies in mice, rats and monkeys the
following were seen in one or more species: vomiting, salivation, urinary
crystals and changes in the adrenals, liver and thyroid. There was some
evidence of developmental and postnatal toxicity in rats but not in
rabbits. No adverse effects on fertility were seen in rats.
The material was negative in a battery of mutagenicity and genotoxicity
assays.
■ Angiolipomas (benign neoplasms of fatty tissue containing a proliferation of, often dilated, blood vessels) may represent a complication of protease-inhibitor (PI) therapy. A lipodystrophy syndrome, characterised by peripheral lipoatrophy and central adiposity, as well as hyperlipidaemia and insulin resistance, develops in many HIV-infected patients undergoing PI therapy. Several cases of patients who developed symptomatic angiolipomas after starting PI-therapy have now been reported. Symptomatic appearance of the lesions followed initiation of PIs by many months. The time course is similar to that reported for the appearance of central fat redistribution after beginning protease inhibitors. One study revealed a higher than expected prevalence of premature carotid vessel lesions in a HIV-patient group treated with PIs for at least 12 months. The overwhelming difference between the percentages of acquired lesions reported for healthy individuals (6.7%) and two seropositive groups including PI-naive (14.9%) and PI-experienced (52.7%) patients indicates that HIV-I positive patients have a much higher risk of endothelial damage which becomes remarkable in the case of patients treated with PI-containing regimes for

prolonged periods of time. Individuals exhibiting the acquired lesion may be at increased risk of developing arteriosclerosis and vascular dysfunction. A significant number of HIV-infected individuals develop type 2 diabetes within 18 months of undertaking PI therapy. Myocardial infarction has also reportedly been associated with PI therapy (after 24-29 months of treatment). Several cases of disfiguring striae (stretch marks) in HIV-patients using PIs have been described; these occurred within 3-months of the start of therapy. The development of resistance and subsequent loss of drug activity constitutes the primary barrier to long-term efficacious use of HIV-I protease inhibitors. Mutations within the protease gene have been described following use of current inhibitors.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
indinivar sulfate		>98

Section 4 - FIRST AID MEASURES

SWALLOWED
■ If poisoning occurs, contact a doctor or Poisons Information Center.

EYE
■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation 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 dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN
■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not available
Relative Vapor Density (air=1):	Not applicable

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
· Solid which exhibits difficult combustion or is difficult to ignite.
· 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) and nitrogen oxides (NOx).
Dust explosivity information: Kst 242 bar/msec (dust explosion hazard)

FIRE INCOMPATIBILITY
■ Avoid contamination with strong oxidizing agents as ignition may result.

PERSONAL PROTECTION
Glasses:
Chemical goggles.
Gloves:
Respirator:
Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
· Remove all ignition sources.
· Clean up all spills immediately.

· Avoid contact with skin and eyes.
· Control personal contact by using protective equipment.
· Use dry clean up procedures and avoid generating dust.
· Place in a suitable, labelled container for waste disposal.
MAJOR SPILLS
■ Remove all ignition sources.
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.
Wash spill area with alkaline sodium hypochlorite solution followed by copious amounts of water.

Section 7 - HANDLING AND STORAGE

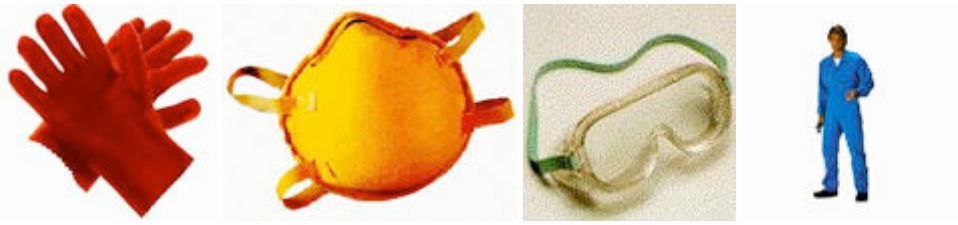
PROCEDURE FOR HANDLING
■ Remove all ignition sources.
· Limit all unnecessary personal contact.
· Wear protective clothing when risk of exposure occurs.
· Use in a well-ventilated area.
· When handling DO NOT eat, drink or smoke.
· Always wash hands with soap and water after handling.
· Avoid physical damage to containers.
· Use good occupational work practice.
· Observe manufacturer's storing and handling recommendations.

RECOMMENDED STORAGE METHODS
· Polyethylene or polypropylene container.
· Packing as recommended by manufacturer.

STORAGE REQUIREMENTS
· Keep dry · Store in original containers
· Keep containers securely sealed.
· No smoking, naked lights or ignition sources.
· Store in a cool, dry, well-ventilated area.
· Store away from incompatible materials and foodstuff containers.
· Protect containers against physical damage and check regularly for leaks.
· Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS
The following materials had no OELs on our records
• indinavir sulfate: CAS:157810-81-6

PERSONAL PROTECTION


RESPIRATOR
Particulate
Consult your EHS staff for recommendations
■ EYE
No special equipment needed when handling small quantities of substance.
For bulk handling wear:
Chemical goggles or
Face shield.

HANDS/FEET
Rubber gloves
PVC gloves
Protective shoe covers
Head covering.

OTHER
No special equipment when handling small quantities of substance otherwise:
Coveralls
For Emergencies:

Vinyl suit
Safety shower

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.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Does not mix with water.

State	Divided solid	Molecular Weight	711.87
Melting Range (°F)	316.4	Boiling Range (°F)	Not available
Solubility in water (g/L)	Partly miscible	Flash Point (°F)	Not available
pH (1% solution)	Not applicable	Decomposition Temp (°F)	Not available
pH (as supplied)	Not applicable	Autoignition Temp (°F)	Not available
Vapour Pressure (mmHG)	Negligible	Upper Explosive Limit (%)	Not available
Specific Gravity (water=1)	Not available	Lower Explosive Limit (%)	Not available
Relative Vapor Density (air=1)	Not applicable	Volatile Component (%vol)	Negligible
Evaporation Rate	Not applicable		

APPEARANCE

White crystalline powder; does not mix well with water (23 mg/l pH 7, 100 mg/l unbuffered water). Generally supplied as the ethanolate. When exposed to humid or wet air the sulfate salt becomes either amorphous or a hydrate; it then decomposes slowly. Decomposition products are not thought to pose additional health hazards.

log Kow 2.66 (pH 7.02)

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

STORAGE INCOMPATIBILITY

■ Avoid storage with oxidizers.

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

Section 11 - TOXICOLOGICAL INFORMATION

INDINAVIR SULFATE

TOXICITY AND IRRITATION

INDINAVIR SULFATE:
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50: >5000 mg/kg	Skin (rabbit): slight
Oral (mouse) LD50: 5000 mg/kg	Eye (bovine): SEVERE (in vitro)
Intraperitoneal (rat) LD50: >5000 mg/kg	(BCO-P)
ADI: 5 mg/day	

Section 12 - ECOLOGICAL INFORMATION

No data

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.
· Consult manufacturer for recycling options and recycle where possible .
· Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

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

Section 15 - REGULATORY INFORMATION

No data for indinavir sulfate (CAS: , 157810-81-6)

Section 16 - OTHER INFORMATION

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 representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. 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.

Issue Date: Oct-15-2010

Print Date:Dec-7-2010