

## 1. Identification

<b>Product identifier</b>	<b>Simvastatin</b>	
<b>Other means of identification</b>		
<b>Catalog number</b>	1612700	
<b>Chemical name</b>	Butanoic acid, 2,2-dimethyl-, 1,2,3,7,8,8a-hexahydro-3,7-dimethyl-8-[2-(tetrahydro-4-hydroxy-6-oxo-2H-pyran-2-yl)ethyl]-1-naphthalenyl ester, [1S-[1alpha, 3alpha, 7beta, 8beta-(2S*, 4S*), 8a beta]]-	
<b>Synonym(s)</b>	Synvinolin	
<b>Recommended use</b>	Specified quality tests and assay use only.	
<b>Recommended restrictions</b>	Not for use as a drug. Not for administration to humans or animals.	
<b>Manufacturer/Importer/Supplier/Distributor information</b>		
<b>Company name</b>	U. S. Pharmacopeia	
<b>Address</b>	12601 Twinbrook Parkway Rockville MD 20852-1790 US	
<b>Telephone</b>	RS Technical Services	301-816-8129
<b>Website</b>	www.usp.org	
<b>E-mail</b>	RSTECH@usp.org	
<b>Emergency phone number</b>	CHEMTREC within US & Canada	1-800-424-9300
	CHEMTREC outside US & Canada	+1 703-527-3887

## 2. Hazard(s) identification

<b>Note</b>	This product is supplied in a small quantity which does not constitute a combustible dust hazard. The physical properties of this material indicate that in large quantities accumulated dust may be hazardous.	
<b>Physical hazards</b>	Not classified.	
<b>Health hazards</b>	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2B
	Reproductive toxicity	Category 1B
<b>OSHA hazard(s)</b>	Not classified.	
<b>Label elements</b>		
<b>Signal word</b>	Danger	
<b>Hazard statement</b>	Causes skin irritation. Causes eye irritation. May damage fertility or the unborn child.	
<b>Precautionary statement</b>		
<b>Prevention</b>	Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.	
<b>Response</b>	If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If exposed or concerned: Get medical advice/attention.	
<b>Storage</b>	Store locked up.	
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.	
<b>Hazard(s) not otherwise classified (HNOC)</b>	Not classified.	

### 3. Composition/information on ingredients

#### Substance

#### Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Simvastatin	Synvinolin	79902-63-9	100

### 4. First-aid measures

<b>Inhalation</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>Skin contact</b>	Remove contaminated clothing. Wash off with soap and plenty of water. If skin irritation occurs: Get medical advice/attention.
<b>Eye contact</b>	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.
<b>Most important symptoms/effects, acute and delayed</b>	Irritation of eyes, skin, and mucous membranes.
<b>Indication of immediate medical attention and special treatment needed</b>	Treatment of statin overdose should be symptomatic and supportive and may include the following: Administer activated charcoal as an aqueous slurry. For rhabdomyolysis, administer 0.9% saline to maintain urine output of 2 - 3 milliliters/kg/hour. Monitor fluid balance, serum electrolytes, CPK, liver enzymes, and renal function. Administer diuretics if needed to maintain urine output. Urinary alkalization is not recommended. Hemodialysis is not expected to enhance clearance. [Poisindex 2009]
<b>General information</b>	Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.

### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Use fire-extinguishing media appropriate for surrounding materials. Water. Foam. Dry chemical or CO <sub>2</sub> .
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard.
<b>Special protective equipment and precautions for firefighters</b>	Wear suitable protective equipment.
<b>Fire-fighting equipment/instructions</b>	Use water spray to cool unopened containers. As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing equipment and protective clothing.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.

### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Avoid inhalation of dust from the spilled material. Wear appropriate personal protective equipment.
<b>Methods and materials for containment and cleaning up</b>	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid the generation of dusts during clean-up. For waste disposal, see section 13 of the SDS. Clean surface thoroughly to remove residual contamination.

### 7. Handling and storage

<b>Precautions for safe handling</b>	As a general rule, when handling USP Reference Standards, avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly. Combustible dust clouds may be created where operations produce fine material (dust). Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions.
<b>Conditions for safe storage, including any incompatibilities</b>	Store in tight container as defined in the USP-NF. This material should be handled and stored per label instructions to ensure product integrity.

## 8. Exposure controls/personal protection

### Exposure limit values

#### Industrial Use

Material	Type	Value
Simvastatin (CAS 79902-63-9)	TWA	0.025 mg/m3

### Biological limit values

No biological exposure limits noted for the ingredient(s).

### Appropriate engineering controls

Airborne exposure should be controlled primarily by engineering controls such as general dilution ventilation, local exhaust ventilation, or process enclosure. Local exhaust ventilation is generally preferred to general exhaust because it can control the contaminant at its source, preventing dispersion into the work area. An industrial hygiene survey involving air monitoring may be used to determine the effectiveness of engineering controls. Effectiveness of engineering controls intended for use with highly potent materials should be assessed by use of nontoxic surrogate materials. Local exhaust ventilation such as a laboratory fume hood or other vented enclosure is recommended, particularly for grinding, crushing, weighing, or other dust-generating procedures.

### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Safety glasses with sideshields are recommended. Face shields or goggles may be required if splash potential exists or if corrosive materials are present. Approved eye protection (e.g., bearing the ANSI Z87 or CSA stamp) is preferred. Maintain eyewash facilities in the work area.

#### Skin protection

##### Hand protection

Chemically compatible gloves. For handling solutions, ensure that the glove material is protective against the solvent being used. Use handling practices that minimize direct hand contact. Employees who are sensitive to natural rubber (latex) should use nitrile or other synthetic nonlatex gloves. Use of powdered latex gloves should be avoided due to the risk of latex allergy.

##### Other

For handling of laboratory scale quantities, a cloth lab coat is recommended. Where significant quantities are handled, work clothing may be necessary to prevent take-home contamination.

#### Respiratory protection

Where respirators are deemed necessary to reduce or control occupational exposures, use NIOSH-approved respiratory protection and have an effective respirator program in place (applicable U.S. regulation OSHA 29 CFR 1910.134).

#### Thermal hazards

Not available.

### General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

### Appearance

White to off-white crystalline powder.

#### Physical state

Solid.

#### Form

Powder.

### Odor

Not available.

### Odor threshold

Not available.

### pH

Not available.

### Melting point/freezing point

275 - 280.4 °F (135 - 138 °C)

### Initial boiling point and boiling range

Not available.

### Flash point

Not available.

### Evaporation rate

Not available.

### Flammability (solid, gas)

Not applicable.

### Upper/lower flammability or explosive limits

#### Flammability limit - lower (%)

Not available.

#### Flammability limit - upper (%)

Not available.

#### Explosive limit - lower (%)

Not available.

#### Explosive limit - upper (%)

Not available.

### Vapor pressure

< 0.0000001 kPa at 25 °C

### Vapor density

Not available.

### Relative density

Not available.

### Solubility in water

Practically insoluble.

### Partition coefficient (n-octanol/water)

4.68

	< 3.3 = Log Kow
<b>Auto-ignition temperature</b>	755 °F (401.67 °C)
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Chemical family</b>	Lactone.
<b>Dust explosion properties</b>	
<b>Kst</b>	313 bar.m/s
<b>Minimum ignition energy (MIE) - dust cloud</b>	> 1 mJ
<b>Molecular formula</b>	C25-H38-O5
<b>Molecular weight</b>	418.56 g/mol
<b>Potential for dust explosion</b>	Very strong explosion class.
<b>Solubility (other)</b>	Freely soluble in ethanol, in chloroform, in methanol, and in dimethylsulfoxide; sparingly soluble in propylene glycol; very slightly soluble in petroleum spirit and in hexane.

## 10. Stability and reactivity

<b>Reactivity</b>	No reactivity hazards known.
<b>Chemical stability</b>	Stable at normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>Conditions to avoid</b>	None known.
<b>Incompatible materials</b>	Oxidizing agents.
<b>Hazardous decomposition products</b>	Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion</b>	Based on available data, the classification criteria are not met.
<b>Inhalation</b>	Due to lack of data the classification is not possible.
<b>Skin contact</b>	Causes skin irritation.
<b>Eye contact</b>	Causes eye irritation.
<b>Symptoms related to the physical, chemical, and toxicological characteristics</b>	Statins: Muscle pain, weakness, or stiffness. Numbness or tingling in arms or legs. Insomnia. Headache. Dizziness. Irritability. Fever. Tiredness. Nausea. Diarrhea. Constipation. Stomach pain. Indigestion. Gas. Skin rash. Sexual dysfunction.
<b>Delayed and immediate effects of exposure</b>	Statins: Upper respiratory infection. Rhabdomyolysis. Muscle inflammation or damage. Peripheral neuropathy.
<b>Cross sensitivity</b>	Persons sensitive to other HMG-CoA reductase inhibitors (e.g., fluvastatin, lovastatin, pravastatin) may be sensitive to this material also.
<b>Medical conditions aggravated by exposure</b>	Statins: Active liver disease or history of. Unexplained persistent elevations of transaminase values. Active alcoholism. Myopathy. Electrolyte, endocrine, or metabolic disorders. Severe infection. Seizure disorders. Organ transplant with immunosuppressant therapy. Amyotrophic lateral sclerosis (ALS). Kidney impairment. Porphyria.
<b>Acute toxicity</b>	Based on available data, the classification criteria are not met.

Product	Species	Test Results
Simvastatin (CAS 79902-63-9)		
<b>Acute</b>		
<i>Oral</i>		
LD50	Mouse	3 g/kg
	Rat	4438 mg/kg
<b>Skin corrosion/irritation</b>	Causes skin irritation.	
<b>Serious eye damage/eye irritation</b>	Causes eye irritation.	
<b>Local effects</b>		
Eye irritancy test		
Result: Slightly irritating.		
Species: Rabbit		

**Local effects**

Skin irritancy test  
 Result: Slightly to moderately irritating.  
 Species: Rabbit

**Respiratory sensitization** Due to lack of data the classification is not possible.

**Skin sensitization** Due to lack of data the classification is not possible.

**Germ cell mutagenicity** Data from germ cell mutagenicity tests were not found.  
 Due to lack of data the classification is not possible.

**Mutagenicity**

Ames test in *S. typhimurium*  
 Result: Negative.  
 Forward mutation study in V-79 mammalian cells  
 Result: Negative.  
 In vitro alkaline elution assay in rat hepatocytes  
 Result: Negative.  
 In vitro chromosomal aberration assay in Chinese hamster ovary cells  
 Result: Negative.  
 In vivo chromosomal aberration assay in mouse bone marrow  
 Result: Negative.

**Carcinogenicity** Based on available data, the classification criteria are not met.  
 This material is not considered to be a carcinogen by IARC, NTP, or OSHA.  
 Although statins have been carcinogenic in animal studies, the relevance of this to humans has been questioned. Studies of human data have not shown an association between use of statins and the incidence of cancer.

25 - 400 mg/kg/day Carcinogenicity study  
 Result: Increased incidence of liver carcinomas and liver, lung, and eye adenomas. No increase in tumors at low dose.  
 Species: Mouse  
 Test Duration: 72 weeks  
 25 mg/kg/day Carcinogenicity study  
 Result: Increased incidence of thyroid adenomas.  
 Species: Rat  
 Test Duration: 2 years  
 50 - 100 mg/kg/day Carcinogenicity study  
 Result: Increased incidence of liver and thyroid carcinomas and adenomas.  
 Species: Rat  
 Test Duration: 2 years

**Reproductive toxicity** May damage fertility or the unborn child.  
 Therapeutic use of statins during pregnancy may decrease cholesterol and cholesterol-derived substances essential for fetal development. Results of animal studies indicate that many statins are associated with adverse fetal outcomes at maternally toxic doses.

**Reproductivity**

10 mg/kg/day Reproductivity and development study  
 Result: Not teratogenic.  
 Species: Rabbit  
 25 mg/kg/day Reproductivity and development study  
 Result: Not teratogenic.  
 Species: Rat

**Specific target organ toxicity - single exposure** Based on available data, the classification criteria are not met.

**Specific target organ toxicity - repeated exposure** Based on available data, the classification criteria are not met.

**Aspiration hazard** Based on available data, the classification criteria are not met.

**12. Ecological information**

**Ecotoxicity** Contains a substance which causes risk of hazardous effects to the environment.

Product	Species	Test Results
Simvastatin (CAS 79902-63-9)		
<i>Acute</i>		
Crustacea	LC50	Daphnia magna
Other	EC50	Pseudokirchnerella subcapitata
		0.16 mg/l, 48 hours
		> 25 mg/l, 96 hours

Product	Species	Test Results
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**Aquatic**

*Acute*

Fish LC50 Fathead minnow (*Pimephales promelas*) 2.91 mg/l, 96 hours

**Persistence and degradability** No data is available on the degradability of this product.

**Bioaccumulative potential** Not available.

**Mobility in soil** Not available.

**Other adverse effects** Not available.

**13. Disposal considerations**

**Disposal instructions** Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

**Local disposal regulations** Not available.

**Hazardous waste code** Not available.

**Waste from residues / unused products** Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging** Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

**14. Transport information**

**DOT**

**UN number** UN3077  
**UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Simvastatin)  
**Transport hazard class(es)** 9  
**Subsidiary class(es)** Not available.  
**Packing group** III

**IATA**

**UN number** UN3077  
**UN proper shipping name** Environmentally hazardous substance, solid, n.o.s. (Simvastatin)  
**Transport hazard class(es)** 9  
**Subsidiary class(es)** -  
**Packaging group** III

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** No information available.

**DOT; IATA**



**15. Regulatory information**

**US federal regulations** CERCLA/SARA Hazardous Substances - Not applicable.

One or more components are not listed on TSCA.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories** Immediate Hazard - Yes  
 Delayed Hazard - Yes  
 Fire Hazard - Yes  
 Pressure Hazard - No  
 Reactivity Hazard - No

**SARA 302 Extremely hazardous substance** No

**SARA 311/312 Hazardous chemical** No

**Other federal regulations**

**Safe Drinking Water Act (SDWA)** Not regulated.

**Food and Drug Administration (FDA)** Not regulated.

**US state regulations**

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

**International Inventories**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

**16. Other information, including date of preparation or last revision**

**Issue date** 02-03-2009

**Revision date** 04-24-2014

**Version #** 02

**Further information** Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

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**Revision Information** This document has undergone significant changes and should be reviewed in its entirety.