



SIGMA-ALDRICH

Material Safety Data Sheet

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Section 1 - Product and Company Information

Product Name (+)-cis-Diltiazem hydrochloride, Minimum 99% (HPLC)
Product Number D2521
Brand Sigma Chemical

Company Sigma-Aldrich
Street Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS, MO 63103 US
Technical Phone: 800-325-5832
Fax: 800-325-5052

Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
DILTIAZEM HYDROCHLORIDE	33286-22-5	No	251-443-3	

Formula C22H26N2O4S.ClH
Synonyms Altiazem, Anginyl, Angizem, Britiazim, Bruzem, Calciocard, Cardizem, CRD-401, Dilpral, Diltiazem chloridate, Diltiazem hydrochloride, Dilzem, Herbesser, Masdil, Tildiem

Section 3 - Hazards Identification

Emergency Overview

Harmful.
Harmful if swallowed.
Target organ(s): Cardiovascular system, Liver.

HMIS Rating
Health: 1* Flammability: 0 Reactivity: 0

NFPA Rating
Health: 1 Flammability: 0 Reactivity: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Autoignition Temp: N/A

Extinguishing Media

Suitable

Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting

Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s)

Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill

Evacuate area.

Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling

User Exposure

Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Storage

Suitable

Keep tightly closed. Store at 2-8°C

Section 8 - Exposure Controls / PPE

Engineering Controls

Safety shower and eye bath. Mechanical exhaust required.

Personal Protective Equipment

Respiratory

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.

Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

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Health

General Hygiene Measures
Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	Color	Form
	White	Powder
Molecular Weight:	451 AMU	
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	212 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point °F	N/A	
Flash Point °C	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Solubility		
Solubility in Water: 50 mg/ml H ₂ O, clear, very faintly yellow		

N/A = not available

Section 10 - Stability and Reactivity

Stability
Stable
Stable.
Conditions of Instability
Light.
Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products

Hazardous Decomposition Products

Carbon monoxide, Carbon dioxide, Nitrogen oxides, Sulfur oxides, Hydrogen chloride gas.

Hazardous Polymerization
Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure

Skin Contact

May cause skin irritation.

Skin Absorption

May be harmful if absorbed through the skin.

Eye Contact

May cause eye irritation.

Inhalation

May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion

Harmful if swallowed.

Target Organ(s) or System(s)

Cardiovascular system, Liver.

Signs and Symptoms of Exposure

Exposure can cause: Gastrointestinal disturbances. Other symptoms include orthostatic hypotension and bradycardia.

RTECS Number: DL0310000

Toxicity Data

Oral - Man: 21 mg/kg (LDLO)

Remarks: Cardiac: Cardiomyopathy including infarction.

Cardiac: Pulse rate.

Vascular: BP lowering not characterized in autonomic section.

Oral - Woman: 120 mg/kg (LDLO)

Remarks: Cardiac: Cardiomyopathy including infarction.

Oral - Rat: 560 mg/kg (LD50)

Remarks: Behavioral: Antipsychotic.

Subcutaneous - Rat: 520 MG/KG (LD50)

Remarks: Behavioral: Antipsychotic.

Intravenous - Rat: 38 MG/KG (LD50)

Remarks: Behavioral: Altered sleep time (including change in righting reflex).

Behavioral: Somnolence (general depressed activity).

Behavioral: Tetany.

Oral - Mouse: 508 mg/kg (LD50)

Intraperitoneal - Mouse: 177 MG/KG (LD50)

Subcutaneous - Mouse: 260 MG/KG (LD50)

Remarks: Behavioral: Antipsychotic.

Intravenous - Mouse: 58 MG/KG (LD50)

Remarks: Behavioral: Antipsychotic.

Chronic Exposure - Teratogen

Species	Dose	Route of Application	Exposure Time
Rat	60 MG/KG	Oral	(9-14D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.			
Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).			
Rat	600 MG/KG	Oral	(11D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).			
Rat	480 MG/KG	Intraperitoneal	(9-14D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).			
Specific Developmental Abnormalities: Other developmental abnormalities.			

Mouse 25 MG/KG Oral (9D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Mouse 25 MG/KG Oral (10D PREG)
Result: Effects on Embryo or Fetus: Fetal death.

Mouse 25 MG/KG Intraperitoneal (9D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Mouse 50 MG/KG Intraperitoneal (9D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Mouse 50 MG/KG Intraperitoneal (13D PREG)
Result: Specific Developmental Abnormalities: Other developmental abnormalities.

Chronic Exposure - Reproductive Hazard

Species	Dose	Route of Application	Exposure Time
Rat	1200 MG/KG	Oral	(9-14D PREG)
	Result: Maternal Effects: Parturition. Effects on Embryo or Fetus: Fetal death.		
Rat	700 MG/KG	Oral	(15-21D PREG)
	Result: Effects on Newborn: Stillbirth. Effects on Newborn: Growth statistics (e.g., reduced weight gain).		
Rat	80 MG/KG	Intraperitoneal	(13D PREG)
	Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Musculoskeletal system.		
Rat	130 MG/KG	Intravenous	(17-21D PREG/21D POST)
	Result: Effects on Newborn: Stillbirth. Effects on Newborn: Growth statistics (e.g., reduced weight gain).		
Rat	378 MG/KG	Intravenous	(14D PRE/1-7D PREG)
	Result: Effects on Fertility: Other measures of fertility		
Mouse	60 MG/KG	Oral	(7-12D PREG)
	Result: Effects on Fertility: Litter size (e.g., # fetuses per litter; measured before birth). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.		
Mouse	100 MG/KG	Oral	(9D PREG)
	Result: Effects on Newborn: Sex ratio.		
Mouse	12500 UG/KG	Intraperitoneal	(11D PREG)
	Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).		
Rabbit	125 MG/KG	Intraperitoneal	(7-16D PREG)
	Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Musculoskeletal system.		

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: None

Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU Additional Classification

Symbol of Danger: Xn

Indication of Danger

Harmful.

Risk Statements R: 22

Harmful if swallowed.

Safety Statements S: 36

Wear suitable protective clothing.

US Classification and Label Text

Indication of Danger

Harmful.

Risk Statements

Harmful if swallowed.

Safety Statements

Wear suitable protective clothing.

US Statements

Target organ(s): Cardiovascular system. Liver.

United States Regulatory Information

SARA Listed: No

United States - State Regulatory Information

California Prop - 65

This product is or contains chemical(s) known to the state of California to cause developmental toxicity.

Canada Regulatory Information

WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: No

Section 16 - Other Information

Disclaimer

For R&D use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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