

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	Highly toxic; do not ingest or inhale. Avoid all contact with this material. Hygroscopic -- keep container tightly sealed.	

Section I. Chemical Product and Company Identification

Chemical Name	Digoxin		
Catalog Number	D1828	Supplier	TCI America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	Card-20(22)-enolide, 3-[(O-2,6-dideoxy-beta-D-ribohexopyranosyl-(1→4)-O-2,6-dideoxy-beta-D-ribohexopyranosyl-(1→4)-2,6-dideoxy-beta-D-ribohexopyranosyl)oxy]-12,14-dihydroxy-, (3beta,5beta,12beta)- (CA INDEX NAME)		
Chemical Formula	C ₄₁ H ₆₄ O ₁₄		
CAS Number	20830-75-5	In case of Emergency Call Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International)	

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Digoxin	20830-75-5	Min. 96.0 (HPLC)	Not available.	Rat LD ₅₀ (oral) 28270 µg/kg Rat LD ₅₀ (intraperitoneal) 4 mg/kg Rat LD ₅₀ (subcutaneous) 8900 ng/kg

Section III. Hazards Identification

Acute Health Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY : Reproductive effects. Domestic Animals -Goat, Sheep TDLo Intramuscular 810 µg/kg, female 1-18 weeks of pregnancy Toxic Effects: Specific Developmental Abnormalities - Blood and lymphatic system Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	Not available.	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO ₂).		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions			

Continued on Next Page

Emergency phone number (800) 424-9300

SMALL FIRE: Use DRY chemical powder.
 LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
 Consult with local fire authorities before attempting large scale fire-fighting operations.

Section VI. Accidental Release Measures

Spill Cleanup Instructions: Highly toxic material. Hygroscopic material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information: HIGHLY TOXIC. HYGROSCOPIC. Keep locked up. Keep away from heat. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, acids.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.



Exposure Limits: Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (Crystal ~ powder, white ~ very pale yellow.)	Solubility	Soluble in pyridine, dilute alcohol, mixture of chloroform and alcohol. Almost insoluble in water (64.8 mg/L 25°C), ether, chloroform, acetone, ethyl acetate.
Specific Gravity	Not available.	Partition Coefficient	Not available.
Molecular Weight	780.94	Vapor Pressure	Not applicable.
Boiling Point	Not available.	Vapor Density	Not available.
Melting Point	230 to 265°C (446 to 509°F) (dec.)	Volatility	Not available.
Refractive Index	Not available.	Odor	Odorless.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	Not available.		

Section X. Stability and Reactivity Data

Stability: This material is stable if stored under proper conditions. (See Section VII for instructions)

Conditions of Instability: Avoid excessive heat and light. Hygroscopic; keep container tightly closed.

Incompatibilities: Reactive with oxidizing agents, acids.

Section XI. Toxicological Information

RTECS Number	IH6125000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD ₅₀ (oral) 28270 µg/kg Rat LD ₅₀ (intraperitoneal) 4 mg/kg Rat LD ₅₀ (subcutaneous) 8900 ng/kg
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY : Reproductive effects. Domestic Animals -Goat, Sheep TDLo Intramuscular 810 µg/kg, female 1-18 weeks of pregnancy Toxic Effects: Specific Developmental Abnormalities - Blood and lymphatic system Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity Not available.

Environmental Fate Digoxin's production and use as a cardiotonic drug may result in its release to the environment through various waste streams. Digoxin is a secondary glycoside obtained from *Digitalis lanata* or *Digitalis orientalis*. If released to air, an estimated vapor pressure of 3.3X10⁻³⁰ mm Hg at 25 deg C indicates digoxin will exist solely in the particulate phase in the ambient atmosphere. Particulate-phase digoxin will be removed from the atmosphere by wet and dry deposition. If released to soil, digoxin is expected to have high mobility based upon an estimated Koc of 120. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 4.7X10⁻²⁷ atm-cu m/mole. If released into water, digoxin is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's estimated Henry's Law constant. An estimated BCF of 2 suggests the potential for bioconcentration in aquatic organisms is low. Since lactone functional groups undergo hydrolysis under acid and basic conditions, hydrolysis may be an important fate process for this compound. Occupational exposure to digoxin may occur through dermal contact with this compound at workplaces where digoxin is produced or used. The general population may be exposed to digoxin with its use as a cardiotonic drug.

Section XIII. Disposal Considerations

Waste Disposal Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

Section XIV. Transport Information

DOT Classification DOT CLASS 6.1: Toxic material

PIN Number UN2811

Proper Shipping Name Toxic solid, organic, n.o.s.

Packing Group (PG) II

DOT Pictograms

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA) This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.

WHMIS Classification (Canada) CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
On DSL.

EINECS Number (EEC) 244-068-1

EEC Risk Statements R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed.

Japanese Regulatory Data Not available.

Section XVI. Other Information

Version 1.0
Validated on 6/28/2011.
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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.