MATERIAL SAFETY DATA SHEET

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24 HR. EMERGENCY MEDICAL INFORMATION:
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SUBSTANCE IDENTIFICATION

SUBSTANCE: DIGOXIN INJECTION

TRADE NAMES/SYNONYMS:
WALPB036

CHEMICAL FAMILY:
Mixture

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: PERCENT: 0.02
DIGOXIN
CAS# 20830-75-5

COMPONENT: PERCENT: >1
ETHYL ALCOHOL
CAS# 64-17-5

COMPONENT: PERCENT: >1
PROPYLENE GLYCOL
CAS# 57-55-6

COMPONENT: PERCENT: >1
WATER

EXPOSURE LIMITS:
ETHYL ALCOHOL (ETHANOL):
1000 ppm (1880 mg/m3) OSHA TWA
1000 ppm (1880 mg/m3) ACGIH TWA
ACGIH A4-Not Classifiable as a Human Carcinogen (Proposed Addition 1995-96)
1000 ppm (1880 mg/m3) NIOSH recommended 10 hour TWA
1000 ppm (1880 mg/m3) DFG MAK TWA;
2000 ppm (3760 mg/m3) DFG MAK 60 minute peak, momentary value, 3 times/shift

Measurement method: Charcoal tube; 2-butanol/carbon disulfide; gas chromatography with flame ionization detection; (NIOSH # 1400, Alcohols I).

PHYSICAL DATA

DESCRIPTION: Clear solution. BOILING POINT: NOT AVAILABLE

SPECIFIC GRAVITY: NOT AVAILABLE VAPOR PRESSURE: NOT AVAILABLE

PH: 6.7-7.6 SOLUBILITY IN WATER: soluble

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
The fire hazard for this product has not been determined. The hazard(s) of the component(s) with the most severe hazard(s) are described below.

Dangerous fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive.

FLASH POINT: unknown

FIREFIGHTING MEDIA:
Dry chemical, carbon dioxide, water spray or alcohol-resistant foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or alcohol-resistant foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

FIREFIGHTING:
Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let burn. (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 26).

Extinguish only if flow can be stopped; use water in flooding amounts as fog, solid streams may not be effective. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

TOXICITY

DIGOXIN:
TOXICITY DATA: 127 ug/kg oral-child TDLo; 200 ug/kg oral-cat LD50; 300 ug/kg oral-dog LDLo; 3500 ug/kg oral-guinea pig LD50; 17,780 ug/kg oral-mouse LD50; 100 ug/kg oral-woman TDLo; 333 ug/kg oral-man TDLo; 200 ug/kg intravenous-infant LDLo; 25 mg/kg intravenous-rat LD50; 50 mg/kg intravenous-infant TDLo; 25 mg/kg intravenous-rat LD50; 7670 ug/kg intravenous-mouse LD50; 159 ug/kg intravenous-cat LDLo; 200 ug/kg intravenous-dog LDLo; 468 ug/kg intravenous-guinea pig LDLo; 3560 ug/kg intravenous-rabbit LD50; 230 ug/kg intravenous-pig LDLo; 124 ug/kg intracerebral-mouse LD50; 3964 ug/kg intraperitoneal-mouse LD50; 800 ug/kg intraperitoneal-guinea pig LD50; 4 mg/kg intraperitoneal-rat LD50; 630 ug/kg intramuscular-guinea pig LD50; 441 ug/kg intraduodenal-cat LDLo; 8600 ug/kg intraduodenal-guinea pig LDLo; 1580 ug/kg intraduodenal-pig LDLo; 2947 ug/kg parenteral-mouse LDLo; 5 mg/kg rectal-rat LDLo; 30 mg/kg subcutaneous-rat LD50; 12,880 ug/kg subcutaneous-mouse LD50; 600 ug/kg subcutaneous-guinea pig LD50; 13 ug/kg/4 days intermittent unreported-man TDLo; reproductive effects data (RTECS).
CARCINOGEN STATUS: None.

ACUTE TOXICITY LEVEL: Highly toxic by ingestion.
TARGET EFFECTS: Poisoning may affect the heart and central nervous system.
AT INCREASED RISK FROM EXPOSURE: Persons with renal insufficiency, hypothyroidism, or heart disorders.
ADDITIONAL DATA: Interactions with medications have been reported.

HEALTH EFFECTS AND FIRST AID

INHALATION:
DIGOXIN:
ACUTE EXPOSURE- No data available.
CHRONIC EXPOSURE- No data available.

FIRST AID- Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:
DIGOXIN:
ACUTE EXPOSURE- No data available on contact. However, skin rash may occur as a rare side effect from ingestion of digoxin.
CHRONIC EXPOSURE- No data available.

FIRST AID- Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

EYE CONTACT:
DIGOXIN:
ACUTE EXPOSURE- Digoxin applied to human eyes at a concentration of 25 mg/100 mL 3 times a day caused injury of the cornea consisting of epithelial edema, swelling of the corneal stroma, and wrinkling of Descemet's membrane, all of which were reversible when the medication was discontinued.
CHRONIC EXPOSURE- No data available for contact. However, systemic poisoning may occur due to ingestion. Rare visual disturbances consisting of blurred vision, photophobia, appearance of snow on objects outdoors, white borders or halos may appear on dark objects, disturbances of color vision may occur particularly causing a yellow or green appearance of objects, but less frequently red. Transitory amblyopia, diplopia and scotomata may ensue. Visual hallucinations and oculomotor paresis have been noted with digoxin. Reduction of intraocular pressure has been produced following ingestion of large doses. However, the doses generally required have caused excessive digestive and cardiovascular side effects.

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

INGESTION:
DIGOXIN:
HIGHLY TOXIC.
ACUTE EXPOSURE- Ingestion of a large dose of cardiac glycosides may cause persistent nausea, salivation, vomiting, diarrhea, abdominal pain and discomfort, anorexia, marked muscular weakness, fatigue, drowsiness, headache, malaise, vertigo, increased irritability, fall

in blood pressure, irregular pulse and cold extremities. Neuralgic pain involving the lower third of the face, paresthesias, aphasia, disorientation, mental depression, personality changes, defects in memory and concentration, delerium, hallucinations, visual disturbances of multiple nature and even frank psychosis may occur. Convulsions and coma are rare. Gynecomastia may be induced in men on digitalis therapy. Anemia, thrombocytopenia and eosinophilia has been reported. Hyperkalemia, oliguria and dysuria may also occur. Acute hemorrhage, necrosis of the intestine and rarely petechial hemorrhage of the myocardium have accompanied digitalis poisoning in man. Bradycardia, heart block, cardiac arrhythmias with symptoms of palpitation, hypotension and sudden death may occur. The most common arrhthmias are ventricular, coupled beats or bigeminy, extrasystoles, supraventricular, paroxysmal atrial tachycardias, ventricular fibrillation, premature beats, wenckebach phenomenon, wandering pacemaker, nonparoxysmal junctional tachycardia developing in the presence of atrial fibrillation and various forms of heart block. Mesenteric infarction from circulatory failure with low cardiac output and hypotension may occur. In infants, cardiac arrhythmias most commonly occur. In children, nodal and atrial tachycardias are common, whereas the ventricular arrhythmias are rare. Severe central nervous system depression may occur. Younger individuals without significant heart disease tend to exhibit bradycardia and heart block while others may exhibit ventricular arrhythmias with or without heart block. Elderly persons are likely to have bizzare mental symptoms. An overdosage of maternally administered digoxin has resulted in fetal toxicity and neonatal death. Cardiac glycosides cross the placental barrier and are excreted in breast milk. However, neonates are relatively resistant to their toxicity. The estimated single lethal dose is 5-25 mg. Death generally is due to ventricular fibrillation or cardiac standstill. Pathologic findings may consist of cardiac failure and pulmonary congestion.

CHRONIC EXPOSURE- Symptoms from acute exposure may come on gradually if repeated or prolonged overdoses are ingested. Hypokalemia is frequently seen with chronic digitalis poisoning. The occurrence of nausea and vomiting tends to limit the amount of the cardiac glycoside ingested.

FIRST AID- If vomiting occurs, keep head lower than hips to help prevent aspiration. Treat symptomatically and supportively. Get medical attention if needed.

REACTIVITY

REACTIVITY:
Stable under normal temperatures and pressures.

INCOMPATIBILITIES:
May be incompatible with acids, bases, and oxidizers.

DECOMPOSITION:
Thermal decomposition may release toxic and/or hazardous gases.

POLYMERIZATION:
Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

STORAGE AND DISPOSAL

Observe all federal, state and local regulations when storing or disposing of this substance.

Storage

Store in accordance with 29 CFR 1910.106.

Bonding and grounding: Substances in production areas with low electroconductivity, which may be ignited by electrostatic sparks, should be stored in containers which meet the bonding and grounding guidelines specified in NFPA 77-1983, Recommended Practice on Static Electricity.

Store away from incompatible substances.

CONDITIONS TO AVOID

Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive and poisonous; do not allow unnecessary personnel in area. Do not overheat containers; containers may violently rupture and travel a considerable distance in heat of fire.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. For small spills, take up with sand or other noncombustible absorbent material and place into containers for later disposal. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas.

PROTECTIVE EQUIPMENT

VENTILATION:
Provide local exhaust ventilation and/or general dilution ventilation to meet published exposure limits.

RESPIRATOR:
The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.
The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any chemical cartridge respirator with organic vapor cartridge(s) with a dust and mist filter.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

CLOTHING:
Protective clothing not required. Avoid repeated or prolonged contact with this substance.

GLOVES:
Protective gloves are not required but recommended.

EYE PROTECTION:
Employee must wear splash-resistant safety glasses to prevent eye contact.

CREATION DATE: 01/08/92 REVISION DATE: 01/05/96

-ADDITIONAL INFORMATION-

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