B10

FISHER-FRESH PRESERVED SPECIMEN(S)
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MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
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(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

SUBSTANCE IDENTIFICATION

SUBSTANCE: **FISHER-FRESH PRESERVED SPECIMEN(S)**

TRADE NAMES/SYNONYMS:
SINGLE-PAC SPECIMENS; MULTI-PAC SPECIMENS; ACC45341

CHEMICAL FAMILY:
Mixture

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=1 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: PROPYLENE GLYCOL PERCENT: 0.1-9.0
CAS# 57-55-6

COMPONENT: FORMALDEHYDE PERCENT: 0.3-0.5
CAS# 50-00-0

OTHER CONTAMINANTS: NONE.

EXPOSURE LIMITS:
PROPYLENE GLYCOL:
50 ppm AIHA recommended TWA; 10 mg/m3 AIHA recommended TWA (aerosol only)

FORMALDEHYDE:
0.75 ppm OSHA TWA; 2 ppm OSHA 15 minute STEL; 0.5 ppm OSHA action level
0.3 ppm (0.37 mg/m3) ACGIH ceiling
ACGIH A2-Suspected Human Carcinogen.
0.016 ppm NIOSH recommended TWA; 0.1 ppm NIOSH recommended 15 min. ceiling
0.5 ppm (0.6 mg/m3) DFG MAK TWA;
1 ppm (1.2 mg/m3) DFG MAK 5 minute peak, momentary value, 8 times/shift

Measurement method: Particulate filter/impinger (2); visible spectrophotometry; (NIOSH Vol. III # 3500).
Also: XAD-2(R) tube; toluene; gas chromatography with flame ionization detection; (NIOSH Vol. III # 2541).

500 pounds SARA Section 302 Threshold Planning Quantity
1000 pounds SARA Section 304 Reportable Quantity
100 pounds CERCLA Section 103 Reportable Quantity
1000 pounds OSHA Process Safety Management Threshold Quantity
Subject to SARA Section 313 Annual Toxic Chemical Release Reporting
Subject to California Proposition 65 cancer and/or reproductive toxicity warning and release requirements- (January 1, 1988)

PHYSICAL DATA

DESCRIPTION: Preserved specimen of various animal types with a mild odor.

MELTING POINT: not available SPECIFIC GRAVITY: not available

ODOR THRESHOLD: 1 ppm VAPOR DENSITY: 1

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
Slight fire hazard when exposed to heat or flame.

FIREFIGHTING MEDIA:
Dry chemical, carbon dioxide, water spray or regular foam
(1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam
(1990 Emergency Response Guidebook, DOT P 5800.5).

FIREFIGHTING:
Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

TOXICITY

PROPYLENE GLYCOL:
IRRITATION DATA: 500 mg/7 days skin-human mild; 104 mg/3 days intermittent skin-human moderate; 10%/2 days skin-man; 100 mg eye-rabbit mild; 500 mg/24 hours eye-rabbit mild.
TOXICITY DATA: 20,800 mg/kg skin-rabbit LD50; 79 gm/kg/56 weeks intermittent oral-child TDLo; 20 gm/kg oral-rat LD50; 22 gm/kg oral-mouse LD50; 18,500 mg/kg oral-rabbit LD50; 22 gm/kg oral-dog LD50; 18,350 mg/kg oral-guinea pig LD50; 22,500 mg/kg subcutaneous-rat LD50; 17,370 mg/kg subcutaneous-mouse LD50; 15,500 mg/kg subcutaneous-guinea pig LDLo; 6423 mg/kg intravenous-rat LD50; 6630 mg/kg intravenous-mouse LD50; 4200 mg/kg intravenous-rabbit LDLo; 26 gm/kg intravenous-dog LD50; 6660 mg/kg intraperitoneal-rat LD50; 3718 mg/kg intraperitoneal-mouse LD50; 14 gm/kg intramuscular-rat LD50; 6300 mg/kg intramuscular-rabbit LDLo; 10 gm/kg/3 days continuous parenteral-infant TDLo; mutagenic data (RTECS); reproductive effects data (RTECS).
CARCINOGEN STATUS: None.
ACUTE TOXICITY LEVEL: Relatively non-toxic by dermal absorption and ingestion.
TARGET EFFECTS: Poisoning may affect the central nervous system and kidneys.
AT INCREASED RISK FROM EXPOSURE: Persons with impaired renal function, or pre-existing skin disorders.
ADDITIONAL DATA: Alcohol may enhance the toxic effects. Interactions with medications have been reported.

FORMALDEHYDE:
IRRITATION DATA: 150 ug/3 days intermittent skin-human mild; 2 mg/24 hours skin-rabbit severe; 540 mg open skin-rabbit mild; 50 mg/24 hours skin-rabbit moderate; 4 ppm/5 minutes eye-human; 1 ppm/6 minutes nonstandard exposure eye-human mild; 750 ug/24 hours eye-rabbit severe; 750 ug eye-rabbit severe; 10 mg eye-rabbit severe.
TOXICITY DATA: 17 mg/m3/30 minutes inhalation-human TCLo; 300 ug/m3 inhalation-man TCLo; 203 mg/m3 inhalation-rat LC50; 400 mg/m3/2 hours inhalation-mouse LC50; 400 mg/m3/2 hours inhalation-cat LCLo; 92 mg/m3 inhalation-mammal LC50; 270 mg/kg skin-rabbit LD50; 108 mg/kg oral-woman LDLo; 643 mg/kg oral-man TDLo; 100 mg/kg oral-rat LD50; 42 mg/kg oral-mouse LD50; 260 mg/kg oral-guinea pig LD50; 420 mg/kg subcutaneous-rat LD50; 300 mg/kg subcutaneous-mouse LD50; 350 mg/kg subcutaneous-dog LDLo; 240 mg/kg subcutaneous-rabbit LDLo; 87 mg/kg intravenous-rat LD50; 48 mg/kg intravenous-rabbit LDLo; 30 mg/kg intravenous-cat LDLo; 70 mg/kg intravenous-dog LDLo; 16 mg/kg intraperitoneal-mouse LDLo; 477 mg/kg unreported-man LDLo; 800 mg/kg parenteral-frog LDLo; mutagenic data (RTECS); reproductive effects data (RTECS); tumorigenic data (RTECS).
CARCINOGEN STATUS: OSHA Carcinogen; Anticipated Human Carcinogen (NTP); Human Limited Evidence, Animal Sufficient Evidence (IARC Group-2A). Epidemiological studies and case reports indicate an excess occurrence of a number of cancers, but evidence for involvement of formaldehyde is strongest for nasal and nasopharyngeal cancer. A significant incidence of squamous cell carcinoma of the nasal cavity was induced in rats exposed to formaldehyde gas.
LOCAL EFFECTS: Corrosive- inhalation, skin, eye, ingestion.
ACUTE TOXICITY LEVEL: Highly toxic by inhalation, toxic by dermal absorption and ingestion.
TARGET EFFECTS: Sensitizer- respiratory, dermal. Poisoning may also affect the kidneys.
AT INCREASED RISK FROM EXPOSURE: Persons with asthma, chronic skin disease or preexisting lung disease.

HEALTH EFFECTS AND FIRST AID

INHALATION:
PROPYLENE GLYCOL:
ACUTE EXPOSURE- Due to its low vapor pressure, inhalation is unlikely at room temperature. However, high concentrations may cause headache, nausea and dullness.
CHRONIC EXPOSURE- Repeated or prolonged exposure to saturated and supersaturated atmospheres has produced no adverse effects in humans or animals.

FORMALDEHYDE:
CORROSIVE/SENSITIZER/CARCINOGEN/HIGHLY TOXIC.
ACUTE EXPOSURE- Concentrations of 0.1-5.0 ppm may cause irritation of the nose and throat; 10-20 ppm may cause difficulty in breathing, a burning sensation in the nose and throat, and coughing; 25-50 ppm may cause tissue

damage and serious respiratory tract injury such as pneumonitis and, rarely, pulmonary edema. Other symptoms may include sneezing, wheezing, pharyngitis, tracheitis, chest constriction, bronchitis, headache, dysphagia, excessive thirst, weakness, palpitations, nausea and vomiting. Very high concentrations have caused human deaths. Hypersensitivity reactions such as laryngeal edema, asthmatic bronchitis, severe obstructive tracheobronchitis, and urticaria have been reported in previously exposed individuals.
CHRONIC EXPOSURE- Repeated or prolonged exposure may cause headache, rhinitis, nausea, drowsiness, respiratory impairment, kidney injury, and pulmonary sensitization. Neuropsychological effects may include sleep disorders, irritability, altered sense of balance, memory deficits, loss of concentration, and mood alterations. Menstrual disorders and secondary sterility have occurred in women. Reproductive effects have been reported in animals. Offspring of rats exposed continuously during pregnancy displayed no visible malformations. Litter sizes, duration of pregnancy, and weight of fetal adrenals and kidneys were increased and weight of fetal lungs and liver were decreased. Long term exposure to formaldehyde is reported to be associated with an increased risk of cancer of the nose and accessory sinuses and nasopharyngeal and oropharyngeal cancer in humans. Slight excesses in the occurrence of lung cancer have been noted in several studies; however, the increases of lung cancers did not display the patterns of increased risk with various measures of exposure usually seen for occupational carcinogens. Animal studies show that repeated exposure to levels of 14.3 ppm induced nasal cavity squamous cell carcinoma in rats, and acute degeneration, necrosis, inflammation, and increased cell replication in the nasal mucosa of rats and mice. The incidences of a variety of non-neoplastic lesions were significantly increased in mice and rats.

FIRST AID- Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:
PROPYLENE GLYCOL:
ACUTE EXPOSURE- Contact may cause irritation with redness in some individuals, particularly on dehydrated or occluded skin. Allergic reactions possibly including dermatitis or erythematous edematous plaques may occur in sensitive persons. Skin absorption may occur and produce central nervous system depression with headache, nausea and dullness.
CHRONIC EXPOSURE- Repeated or prolonged contact may cause mild to moderate irritation in humans. Allergic skin reactions have been reported. In experimental animals, propylene glycol possesses ototoxic properties when instilled in the ear.

FORMALDEHYDE:
CORROSIVE/SENSITIZER/TOXIC.
ACUTE EXPOSURE- Vapors or solutions may cause smarting, white discoloration, roughness, hardness, anesthesia, and first degree burns. Sensitization dermatitis characterized by an eczematous, vesicular reaction which occurs suddenly with eruptions on the eyelids, face, neck, scrotum, and arms, may occur in previously exposed individuals. Urticaria has also been reported. The lethal dose in rabbits was 270 mg/kg. The symptoms were not reported.
CHRONIC EXPOSURE- Prolonged or repeated exposure may cause second degree burns, numbness, an itching rash, fingernail damage, hardening and tanning of the skin and sensitization. The resulting dermatitis may be either a sudden vesicular reaction, or may be delayed several years with eruptions starting on the digital areas, wrists and other parts of the body. Mice developed severe liver damage following treatment on the skin.

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

EYE CONTACT:
PROPYLENE GLYCOL:
ACUTE EXPOSURE- A drop applied to the human eye caused immediate stinging, blepharospasm, and lacrimation, followed by mild transient conjunctival hyperemia, but no residual discomfort or injury.
CHRONIC EXPOSURE- No data available.

FORMALDEHYDE:
CORROSIVE.
ACUTE EXPOSURE- Concentrations of 0.05-3.0 ppm may cause irritation with redness, itching, pain, blurred vision, and mild lacrimation; 4-20 ppm may cause profuse lacrimation, and ocular damage. Aqueous solutions have caused effects ranging from transient, minor injury and discomfort to severe, permanent corneal opacification, and loss of vision. Corneal opacification may be delayed from several minutes to hours.
CHRONIC EXPOSURE- Effects depend on the concentration and duration of exposure. Repeated or prolonged contact with corrosive substances may result in conjunctivitis or effects as in acute exposure.

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

INGESTION:
PROPYLENE GLYCOL:
ACUTE EXPOSURE- May cause abdominal spasms, vomiting, and unconsciousness. Ingestion of 60 milliliters has produced reversible central nervous system depression with stupor in humans. 1-1.5 gm/kg reduced intraocular pressure in humans by raising the osmotic pressure of the blood. Dermal eruptions have been reported following ingestion by persons who exhibit dermal sensitivity to propylene glycol.
CHRONIC EXPOSURE- Repeated ingestion of vitamin preparations containing propylene glycol has resulted in stupor, tachypnea, tachycardia, diaphoresis, seizures and unconsciousness in children. Feeding studies at very high doses in rats and rabbits produced central nervous system depression, hemolysis and minimal kidney changes. Very slight liver damage was noted in rats fed 0.9-1.77 ml/kg for 24 months. Death occurred in animals given 25-50% in drinking water. Administration of 7.5% in the diet produced no adverse effects on reproduction in rats. Higher levels affected growth, feeding, mating, and weaning.

FORMALDEHYDE:
CORROSIVE/TOXIC.
ACUTE EXPOSURE- Ingestion of the gas is not likely to occur; however, ingestion of solutions may cause burning of the mouth, throat and stomach, difficulty swallowing, nausea, vomiting and diarrhea, possibly bloody, severe abdominal pain, headache, hypotension, vertigo, stupor, convulsions, unconsciousness and coma. Degenerative changes of the liver, heart and brain, and damage of the spleen, pancreas, central nervous system , and kidneys with albuminuria, hematuria, anuria, and acidosis may occur. Aspiration may result in chemical pneumonitis. Delayed stenosis of the upper gastrointestinal tract may also occur. Death may be delayed for several hours to days and may be due to shock or circulatory or respiratory failure. A mean fatal dose in humans is 1-2 ounces of a 37% solution. Reproductive effects have been reported in animals.
CHRONIC EXPOSURE- Repeated ingestion of small amounts of formaldehyde may cause gastrointestinal irritation, vomiting, and dizziness. Sensitization reactions have been reported. Men who ingested formaldehyde in milk for 15 days complained of stomach or intestinal pain and headache. Other reported symptoms included a burning sensation in the throat, a slight decrease in body temperature, and, in 4 of the men, an itching rash on the chest and thighs.

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

REACTIVITY

REACTIVITY:
Stable under normal temperatures and pressures.

INCOMPATIBILITIES:
PROPYLENE GLYCOL:
ACID ANHYDRIDES: Incompatible.
ACID CHLORIDES: Incompatible.
CHLOROFORMATES: Incompatible.
METALS (LIGHT): Reaction forms flammable hydrogen gas.
NITRIC ACID, HYDROFLUORIC ACID AND SILVER NITRATE: Mixture forms explosive silver fulminate.
OXIDIZERS: Fire and explosion hazard.
PLASTICS: May be attacked.
REDUCING AGENTS: Incompatible.
SEE ALSO: Alcohols.

ALCOHOLS:
ACETALDEHYDE: Violent condensation reaction.
BARIUM PERCHLORATE: Formation of highly explosive perchloric ester on refluxing.
CHLORINE: Formation of highly explosive alkyl hypochlorites.
DIETHYL ALUMINUM BROMIDE: Spontaneous ignition.
ETHYLENE OXIDE: Possible explosion.
HEXAMETHYLENE DIISOCYANATE: Possible explosion in absence of solvent.
HYDROGEN PEROXIDE + SULFURIC ACID: Possible explosion.
HYPOCHLOROUS ACID: Formation of highly explosive alkyl hypochlorites.
ISOCYANATES: Possible explosion in absence of solvent.
LITHIUM ALUMINUM HYDRIDE: Vigorous reaction.
NITROGEN TETROXIDE: Possible explosion.
PERCHLORIC ACID (HOT): Dangerous interaction.
PERMONOSULFURIC ACID: Possible explosion on contact with primary or secondary alcohols.
TRI-ISO-BUTYL ALUMINUM: Violent reaction.

FORMALDEHYDE:
ACIDS (INORGANIC): Formaldehyde solutions react.
ALKALIES (STRONG): Formaldehyde solutions react.
AMMONIA: Incompatible.
ANHYDRIDES: Formaldehyde solutions react.
ANILINE + PERCHLORIC ACID: Aniline treated with perchloric acid, then with formaldehyde, gives a resinous product which burns with explosive violence.

BISULFIDES: Incompatible.
COPPER: Formaldehyde solutions may be corrosive.
COPPER ALLOYS: Formaldehyde solutions may be corrosive.
COPPER SALTS: Formaldehyde solutions may be corrosive.
IODINE: Incompatible.
IRON PREPARATIONS: Incompatible.
ISOCYANATES: Formaldehyde solutions react.
HYDROCHLORIC ACID: Forms highly toxic bis(chloromethyl) ether.
HYDROGEN PEROXIDE: Violent reaction.
NITROGEN DIOXIDE: Slow reaction becomes explosive around 180 C.
NITROMETHANE: Forms explosive compound in the presence of alkalies.
OXIDES: Formaldehyde solutions react.
OXIDIZERS (STRONG): Fire and explosion hazard.
PEROXYFORMIC ACID (CONCENTRATED): Violent oxidation reaction.
PHENOL: Polymerization reaction with sudden pressure development.
POTASSIUM PERMANGANATE: Incompatible.
SILVER SALTS: Incompatible.
STEEL: Formaldehyde solutions may be corrosive.
UREA: Formaldehyde solutions react.

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

Keep in a tightly closed container. Store in a cool, dry, ventilated area.

Store away from incompatible substances.

Threshold Planning Quantity (TPQ):
The Superfund Amendments and Reauthorization Act (SARA) Section 302 requires that each facility where any extremely hazardous substance is present in a quantity equal to or greater than the TPQ established for that substance notify the state emergency response commission for the state in which it is located. Section 303 of SARA requires these facilities to participate in local emergency response planning (40 CFR 355.30).

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CONDITIONS TO AVOID

May burn but does not ignite readily. Avoid contact with strong oxidizers, excessive heat, sparks, or open flame.

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SPILL AND LEAK PROCEDURES

WATER SPILL:
The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits contaminating any known source of drinking water with substances known to cause cancer and/or reproductive toxicity.

OCCUPATIONAL SPILL:
Soak up spill with vermiculite or other absorbent material and place into suitable containers for later disposal.

Reportable Quantity (RQ):
The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity established for that substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

PROTECTIVE EQUIPMENT

VENTILATION:
Provide general dilution ventilation.

RESPIRATOR:
Based on the components present and/or information in physical data, health effects or toxicity sections, no respirator would be required under the normal conditions of use. However, air contamination monitoring should be carried out to assure that the employees are not exposed to harmful concentrations of any of the above mentioned components.
If respiratory protection is required, it must be based on the contamination levels found in the workplace, must not exceed the working limits of the respirator and be jointly approved by the National Institute for

Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

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:
Employee must wear appropriate protective gloves to prevent contact with this substance.

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

AUTHORIZED - FISHER SCIENTIFIC, INC.
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-ADDITIONAL INFORMATION-