MATERIAL SAFETY DATA SHEET

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ISK BIOSCIENCES™

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Frigate®/Lo-Dose®

HAZARD MATERIALS IDENTIFICATION SYSTEM (HMIS) RATING

2 Health 3 Flammability 0 Reactivity

Ratings based upon Revised NPCA-HMIS Rating Manual (1984).

TRANSPORTATION INFORMATION

This product is classified for transportation as follows:

	Regulated	Non-Regulated
IATA (air)	X	
IMO (water)	X	
DOT (land)	X	

Freight Classification: Adjuvant, liquid, n.o.i.

DOT Shipping Description: Flammable liquids, n.o.s.(isobutanol), 3, UN1993, PG III

Contact the Transportation Department of ISK Biosciences at (216) 357-4138 for any additional information.

SARA TITLE III INFORMATION

313 Inventory Ingredients: Not applicable
311/312 Hazards Classification: Acute, Fire

I PRODUCT IDENTIFICATION

Product Name: Frigate®/ Lo-Dose®
ISK Biosciences' Product Codes: 3194
EPA Reg. No.: Not applicable
Synonyms: Ethylan T-158; Tallow Fatty Acid Amine Ethoxylate

II HAZARDOUS INGREDIENTS

The substances listed below are those identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

COMPONENT	CAS No.
Tallow Fatty Acid Amine Ethoxylate	61791-26-2
Isobutanol (2-Methyl-1-Propanol)	78-83-1

Exposure Limits for Frigate®/ Lo-Dose®:
ACGIH-TLV: Not Established
OSHA-PEL: Not Established

Exposure Limits for Isobutanol:
ACGIH-TLV: 50 ppm, TWA
OSHA-PEL: 100 ppm, TWA

III PHYSICAL DATA

Boiling Point, 760 mm Hg: 108°C
Melting Point: Not Applicable
Freezing Point: <-20°C
Specific Gravity (H_2O=1): .984
Vapor Pressure: Not Determined
Vapor Density (Air=1): Not Applicable
Solubility in H_2O, % by Wt.:
Formulation: 100% soluble in water
% Volatiles by Vol.: 15%
Evaporation Rate (Butyl Acetate=1): Not Determined
Appearance and Odor: Yellow liquid, alcohol odor
Density at 25°C: 8.2 lbs/gal
pH: 9.8 (1% in water)

IV FIRE AND EXPLOSION DATA

Flash Point: 35°C
Autoignition Temperature: Not Determined
Flammable Limits in Air, % by Vol.: Not Determined
Extinguishing Media: Dry chemical, CO_2 or water spray. Water may be ineffective in fighting fires of liquids of low flashpoints, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak.
Special Fire Fighting Procedures: Pressure-demand, self-contained breathing apparatus should be worn by firefighters in buildings or confined areas.
Unusual Fire and Explosion Hazard: Under normal conditions, material is stable

V HEALTH HAZARD INFORMATION

Health Hazard Data
Oral LD_{50}: 710 mg/kg (male-rat); 620 mg/kg (female-rat)
Dermal LD_{50}: >10,000mg/kg
Inhalation (4-hour) LC_{50} : .34 mg/L (actual-rat)
Primary Dermal Irritation Index: 3.2/8.0 (moderate irritant; rabbit)
Primary Eye Irritation Index: Positive eye irritant (rabbit), corneal opacity, corneal, iridal and conjunctival irritation was produced. Washing reduced the ocular irritation slightly.

Effects of Exposure
Inhalation: Inhalation of the vapors may cause irritation of the respiratory passages. Continued inhalation may result in headache, dizziness and possible central nervous system depression which may lead to unconsciousness.

Skin Contact: May cause skin irritation.
Skin Absorption: No data available. Systemic toxicity by this route is not expected.
Eye Contact: Causes irreversible eye damage to albino rabbits. Permanent damage would not be expected in human eyes if flushed with water as recommended.
Ingestion: Expected to be irritating to the digestive tract.

Effects of Overexposure
Acute Overexposure: May cause irritation to eyes, skin, respiratory passages and digestive tract. Overexposure by inhalation or ingestion may result in central nervous system depression which may lead to unconsciousness.
Chronic Overexposure: Repeated skin contact may cause dermatitis.

Listed As Carcinogen By:	IARC	NTP	OSHA	CA (Prop 65)
Isobutanol	No	No	No	No

Emergency and First Aid Procedures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of the entire eye surface. Seek medical attention if irritation persists

Skin: Wash exposed area with plenty of soap and water.

Inhalation: Get person out of contaminated area to fresh air. If breathing has stopped, artificial respiration should be started. Oxygen may be administered, if readily available. Seek medical attention if symptoms develop.

Ingestion: Have conscious patient drink several glasses of water then induce vomiting by having patient tickle back of throat with finger. Keep airway clear. NEVER give anything by mouth to unconscious person. Seek medical attention.

Notes to Physician
None.

VI REACTIVITY DATA

Conditions Contributing to Instability: Under normal use conditions, this product is stable.
Incompatibility: None.
Hazardous Decomposition Products: Material may decompose at high temperature to form CO or CO_2
Conditions Contributing to Hazardous Polymerization: Material is not known to polymerize.

VII SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled: This product is toxic to fish. Keep out of lakes, streams or ponds. Stop leaks. Contain spill by diking. Remove as much as much as possible. Remove contaminated soil. Soak up small spills or residual material with inert absorbent material, place in closed labeled containers and store in a safe place out of doors to await proper disposal. Persons performing this work should wear adequate personal protective equipment and clothing.

Neutralizing Chemicals: None required.

VIII INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements: Good industrial hygiene practice dictates that indoor work areas be isolated and provided with adequate local exhaust ventilation. In out-of-doors batch operations, work upwind.

Specific Personal Protective Equipment
Respiratory: To reduce potential overexposure, NIOSH - Approved dust or pesticide respirators should be employed.
Eye: Chemical goggles or eye shield.
Gloves: Chemically resistant gloves should be worn.
Other Clothing and Equipment: Protective clothing consisting of long sleeve shirt, long pants and impermeable gloves and boots should be worn when handling or applying this product. Persons exposed routinely to this product should shower after completing work each day. Contaminated clothing should be removed and washed thoroughly before re-using.

IX SPECIAL PRECAUTIONS

Environmental Hazards
This product is toxic to fish, aquatic invertebrates and marine/ estuarine organisms. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash waters. Do not apply when weather conditions favor drift from treated areas. Apply only to areas specified on label.

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

Storage: Store in original container, tightly closed, in a cool, safe place with adequate ventilation. Keep away from heat, sparks and flame.

Product Disposal: Chemical wastes are toxic. Improper disposal of excess chemical, chemical spray or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: Do not reuse empty container. Triple rinse (or equivalent) and offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other methods allowed by state and local authorities.