MATERIAL SAFETY DATA SHEET

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Section 1 - Product and Company Information

Product Name	ETHANOL, 190 PROOF, FOR MOLECULAR BIOLOGY
Product Number	E7148
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street 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
ETHYL ALCOHOL, NON-DENATURED, 190 PROOF	64-17-5	No

Formula C2H6O
RTECS Number: KQ6300000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Irritant.
Highly flammable. Irritating to eyes, respiratory system and skin.
Target organ(s): Nerves. Liver.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

*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 contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS
Flammable Hazards: Yes

EXPLOSION HAZARDS
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT
57 °F 14 °C Method: closed cup

EXPLOSION LIMITS
Lower: 3.3 % Upper: 19 %

AUTOIGNITION TEMP
363 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.
Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep container closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Handle and store under nitrogen.

SPECIAL REQUIREMENTS
Hygroscopic.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. 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 full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling. Wash contaminated clothing before reuse.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	1000 PPM
USA	MSHA Standard-air	TWA	1000 PPM (1900 MG/M3)
USA	OSHA.	PEL	8H TWA 1000 PPM (1900 MG/M3)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	1000 PPM

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	1900 MG/M3
Poland		NDSCh	-
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless

Property	Value	At Temperature or Pressure
Molecular Weight	46.07 AMU	
pH	N/A	
BP/BP Range	78.0 - 80.0 °C	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	44.6 mmHg	20 °C

Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	0.816 g/cm3	
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	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	57 °F 14 °C	Method: closed cup
Explosion Limits	Lower: 3.3 %	
	Upper: 19 %	
Flammability	N/A	
Autoignition Temp	363 °C	
Refractive Index	1.362	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Complete	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions to Avoid: Moisture.
Materials to Avoid: Alkali metals, Ammonia, Oxidizing agents, Peroxides.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Nature of decomposition products not known.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Heart. Liver. Nerves.

SIGNS AND SYMPTOMS OF EXPOSURE

Can cause CNS depression. Narcotic effect. Damage to the heart. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Inhalation
Rat

20,000 ppm
LC50
Oral
Rat
7,060 mg/kg
LD50
Oral
Human
1,400 mg/kg
LD50

Oral
Child
2000 mg/kg
LDLO
Remarks: Blood:Other changes. Liver:Fatty liver degeneration. Lungs, Thorax, or Respiration:Other changes.

Oral
Human
1400 mg/kg
LDLO
Remarks: Behavioral:Sleep. Behavioral:Headache. Gastrointestinal:Nausea or vomiting.

Subcutaneous
Infant
19440 MG/KG
LDLO
Remarks: Behavioral:Coma. Nutritional and Gross Metabolic:Changes in:Body temperature decrease. Behavioral:Convulsions or effect on seizure threshold.

Oral
Rat
7060 mg/kg
LD50
Remarks: Lungs, Thorax, or Respiration:Other changes.

Inhalation
Rat
20,000 ppm
LC50

Intraperitoneal
Rat
3600 UG/KG
LD50

Intravenous
Rat
1440 MG/KG
LD50
Remarks: Lungs, Thorax, or Respiration:Dyspnea.

Intraarterial
Rat
11 MG/KG
LD50
Remarks: Lungs, Thorax, or Respiration:Dyspnea. Lungs, Thorax, or Respiration:Chronic pulmonary edema.

Oral
Mouse
3450 mg/kg
LD50

Inhalation
Mouse
39,000 mg/m3
LC50

Intraperitoneal
Mouse
528 MG/KG
LD50

Subcutaneous
Mouse
8285 MG/KG
LD50

Intravenous
Mouse
1973 MG/KG
LD50

Oral
Rabbit
6300 mg/kg
LD50

Intraperitoneal
Rabbit
963 MG/KG
LD50

Intravenous
Rabbit
2374 MG/KG
LD50

Oral
Guinea pig
5560 mg/kg
LD50

Intraperitoneal
Guinea pig
3414 MG/KG
LD50

Intraperitoneal
Hamster
5068 MG/KG
LD50

Intraperitoneal
Mammal
4300 MG/KG
LD50
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Somnolence (general depressed activity).
Behavioral:Change in motor activity (specific assay).

IRRITATION DATA

Skin
Rabbit
400 mg
Remarks: Open irritation test

Skin
Rabbit
20 mg
24H
Remarks: Moderate irritation effect

Eyes
Rabbit
500 mg
Remarks: Severe irritation effect

Eyes
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Eyes
Rabbit
100 mg
4S
Remarks: Rinsed

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Species: Mouse
Route of Application: Oral
Dose: 320 MG/KG
Exposure Time: 50W
Frequency: I
Result: Blood:Lymphomas including Hodgkin's disease. Liver:Tumors. Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

Species: Mouse
Route of Application: Rectal
Dose: 120 GM/KG
Exposure Time: 18W
Frequency: I
Result: Gastrointestinal:Tumors. Liver:Tumors. Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

Species: Mouse
Route of Application: Oral
Dose: 400 GM/KG
Exposure Time: 57W
Frequency: I
Result: Gastrointestinal:Tumors. Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

ACGIH CARCINOGEN LIST

Rating: A4

CHRONIC EXPOSURE - TERATOGEN

Species: Woman
Dose: 250 MG/KG
Route of Application: Oral
Exposure Time: (37W PREG)
Result: Effects on Embryo or Fetus: Other effects to embryo.

Species: Rat
Dose: 4 GM/KG
Route of Application: Oral
Exposure Time: (13D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Rat
Dose: 12 GM/KG
Route of Application: Oral
Exposure Time: (9-12D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 24 GM/KG
Route of Application: Oral
Exposure Time: (14-16D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Rat
Dose: 4 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Eye, ear. Specific Developmental Abnormalities: Urogenital system.

Species: Rat
Dose: 44 GM/KG
Route of Application: Oral
Exposure Time: (7-17D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Urogenital system.

Species: Rat
Dose: 20000 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-22D PREG)
Result: Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Rat
Dose: 2240 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (9-12D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).

Species: Rat

Dose: 600 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 600 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-15D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 4 GM/KG
Route of Application: Intravenous
Exposure Time: (6-7D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Specific Developmental Abnormalities: Musculoskeletal system. Effects on Embryo or Fetus: Other effects to embryo.

Species: Rat
Dose: 4 GM/KG
Route of Application: Intravenous
Exposure Time: (6-7D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Other developmental abnormalities. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 162 GM/KG
Route of Application: Oral
Exposure Time: (11-19D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).

Species: Mouse
Dose: 5800 MG/KG
Route of Application: Oral
Exposure Time: (7D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Eye, ear.

Species: Mouse
Dose: 75600 MG/KG
Route of Application: Oral
Exposure Time: (5-11D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Mouse
Dose: 5500 MG/KG
Route of Application: Oral
Exposure Time: (9D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 5800 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 5800 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (7D PREG)
Result: Specific Developmental Abnormalities: Eye, ear. Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Mouse
Dose: 5622 UG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Specific Developmental Abnormalities: Eye, ear. Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 4 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Monkey
Dose: 32400 MG/KG
Route of Application: Oral
Exposure Time: (2-19W PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Monkey
Dose: 43200 MG/KG
Route of Application: Oral
Exposure Time: (1-24W PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).

Species: Rabbit
Dose: 15 MG/KG
Route of Application: Intravenous
Exposure Time: (15-29D PREG)
Result: Effects on Embryo or Fetus: Other effects to embryo. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Guinea pig
Dose: 240 GM/KG
Route of Application: Oral
Exposure Time: (2-61D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Effects on Embryo or Fetus: Fetotoxicity (except death,

e.g., stunted fetus).

Species: Guinea pig
Dose: 72 GM/KG
Route of Application: Oral
Exposure Time: (45-62D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Domestic Animals
Dose: 94 GM/KG
Route of Application: Intravenous
Exposure Time: (14-21W PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Domestic Animals
Dose: 40 GM/KG
Route of Application: Intravenous
Exposure Time: (14-17W PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Newborn: Biochemical and metabolic.

Species: Domestic Animals
Dose: 1 GM/KG
Route of Application: Intravenous
Exposure Time: (18W PREG)
Result: Specific Developmental Abnormalities: Respiratory system.

Species: Mammal
Dose: 31500 MG/KG
Route of Application: Oral
Exposure Time: (15-35D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 220 MMOL/L
Cell Type: lymphocyte
Mutation test: DNA inhibition

Species: Human
Dose: 1160 GM/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Human
Dose: 12000 PPM
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Human
Dose: 1 PPH/72H-C
Cell Type: leukocyte
Mutation test: Cytogenetic analysis

Species: Human
Dose: 500 PPM
Exposure Time: 72H

Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Rat
Route: Oral
Dose: 4 GM/KG
Mutation test: DNA damage

Species: Rat
Route: Intraperitoneal
Dose: 250 GM/KG
Exposure Time: 16D
Mutation test: Other mutation test systems

Species: Rat
Route: Oral
Dose: 3 GM/KG
Mutation test: Other mutation test systems

Species: Rat
Route: Oral
Dose: 2 GM/KG
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Intraperitoneal
Dose: 1240 MG/KG
Exposure Time: 2D
Mutation test: Micronucleus test

Species: Mouse
Route: Oral
Dose: 40 GM/KG
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Oral
Dose: 420 MG/KG
Exposure Time: 3W
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Oral
Dose: 5 GM/KG
Mutation test: SLN

Species: Mouse
Route: Oral
Dose: 3720 MG/KG
Exposure Time: 3D
Mutation test: Dominant lethal test

Species: Mouse
Route: Oral
Dose: 1500 MG/KG
Exposure Time: 50D
Mutation test: sperm

Species: Hamster
Dose: 100 PPM
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 1 PPH
Cell Type: Embryo
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 160 MMOL/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 3900 MG/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Dog
Dose: 400 UMOL/L
Cell Type: lymphocyte
Mutation test: Micronucleus test

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Woman
Dose: 41 GM/KG
Route of Application: Oral
Exposure Time: (41W PREG)
Result: Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects. Effects on Newborn: Drug dependence.

Species: Woman
Dose: 8 GM/KG
Route of Application: Intravenous
Exposure Time: (32W PREG)
Result: Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects.

Species: Woman
Dose: 200 MG/KG
Route of Application: Intrauterine
Exposure Time: (5D PRE)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat
Dose: 78 GM/KG
Route of Application: Oral
Exposure Time: (7-19D PREG)
Result: Effects on Newborn: Biochemical and metabolic.

Species: Rat
Dose: 322 GM/KG
Route of Application: Oral
Exposure Time: (35D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 132 GM/KG

Route of Application: Oral
Exposure Time: (1-22D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral. Maternal Effects: Parturition.

Species: Rat
Dose: 354 GM/KG
Route of Application: Oral
Exposure Time: (10D POST)
Result: Effects on Newborn: Biochemical and metabolic.

Species: Rat
Dose: 35295 MG/KG
Route of Application: Oral
Exposure Time: (1-15D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat
Dose: 15 GM/KG
Route of Application: Intraperitoneal
Exposure Time: (8-13D PREG)
Result: Effects on Newborn: Behavioral. Effects on Newborn: Physical.

Species: Rat
Dose: 600 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-15D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 3 GM/KG
Route of Application: Intravenous
Exposure Time: (6-7D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 5 MG/KG
Route of Application: Intracerebral
Exposure Time: (1D PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Rat
Dose: 60 GM/KG
Route of Application: Unreported
Exposure Time: (9-14D PREG)
Result: Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 400 MG/KG
Route of Application: Intratesticular
Exposure Time: (1D MALE)
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rat
Dose: 2400 MG/KG
Route of Application: Intrauterine
Exposure Time: (10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 642 GM/KG
Route of Application: Multiple
Exposure Time: (1-21D PREG/23D POST)
Result: Maternal Effects: Parturition. Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Rat
Dose: 373 GM/KG
Route of Application: Multiple
Exposure Time: (23D POST)
Result: Effects on Newborn: Behavioral. Effects on Newborn: Physical.

Species: Mouse
Dose: 21 GM/KG
Route of Application: Oral
Exposure Time: (1-21D PREG)
Result: Effects on Newborn: Biochemical and metabolic. Effects on Newborn: Behavioral.

Species: Mouse
Dose: 1680 GM/KG
Route of Application: Oral
Exposure Time: (70D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

Species: Mouse
Dose: 4300 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Dog
Dose: 21600 MG/KG
Route of Application: Oral
Exposure Time: (1-60D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Stillbirth.

Species: Dog

Dose: 260 GM/KG
Route of Application: Oral
Exposure Time: (1-62D PREG)
Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Dog
Dose: 221 GM/KG
Route of Application: Oral
Exposure Time: (1-47D PREG)
Result: Effects on Fertility: Abortion.

Species: Dog
Dose: 100 MG/KG
Route of Application: Intratesticular
Exposure Time: (1D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Monkey
Dose: 78 GM/KG
Route of Application: Oral
Exposure Time: (4-23W PREG)
Result: Effects on Fertility: Abortion.

Species: Monkey
Dose: 400 MG/KG
Route of Application: Oral
Exposure Time: (2-21W PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Monkey
Dose: 206 GM/KG
Route of Application: Oral
Exposure Time: (90D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Rabbit
Dose: 3945 MG/KG
Route of Application: Oral
Exposure Time: (1D PRE)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rabbit
Dose: 3750 MG/KG
Route of Application: Oral
Exposure Time: (1D PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Pig
Dose: 2648 GM/KG
Route of Application: Oral
Exposure Time: (78W PRE/1-16W PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Guinea pig
Dose: 90 GM/KG
Route of Application: Oral

Exposure Time: (1-68D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.

Species: Guinea pig
Dose: 264 GM/KG
Route of Application: Oral
Exposure Time: (2-67D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Biochemical and metabolic. Effects on Newborn: Physical.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 13,000 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 9.3 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 10,400 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 15,300 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 24 h
Value: 10,000 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Ethanol [or] Ethyl alcohol [or] Ethanol solutions [or] Ethyl alcohol solutions
UN#: 1170
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Ethanol
IATA UN Number: 1170
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: F
Indication of Danger: Highly Flammable.
R: 11
Risk Statements: Highly flammable.
S: 7-16
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Flammable (USA) Highly Flammable (EU). Irritant.
Risk Statements: Highly flammable. Irritating to eyes, respiratory system and skin.
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.
US Statements: Target organ(s): Nerves. Liver.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No
TSCA INVENTORY ITEM: Yes

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: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For Industrial Use Only; Not for Beverage Consumption

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.