



SIGMA-ALDRICH

## Material Safety Data Sheet

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Version 1.200

### Section 1 - Product and Company Information

**Product Name** Ethanol, 200 proof, HPLC/Spectrophotometric grade  
**Product Number** 459828  
**Brand** Aldrich Chemical  
**Company** Sigma-Aldrich  
**Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 800-325-5832  
**Fax:** 800-325-5052  
**Emergency Phone:** 314-778-6555

### Section 2 - Composition/Information on Ingredient

| <u>Substance Name</u>                   | <u>CAS #</u> | <u>SARA 313</u> | <u>EC no</u> | <u>Annex I Index Number</u> |
|-----------------------------------------|--------------|-----------------|--------------|-----------------------------|
| ETHYL ALCOHOL, NON-DENATURED, 200 PROOF | 64-17-5      | No              | 200-578-6    | 603-002-00-5                |

**Formula** C<sub>2</sub>H<sub>6</sub>O  
**Synonyms** Absolute ethanol, Aethanol (German), Aethylalkohol (German), Alcohol, Alcohol, anhydrous, Alcohol dehydrated, Alcool ethylique (French), Alcool etilico (Italian), Algrain, Alkohol (German), Alkohol, etylowego (Polish), Anhydrol, Cologne Spirit, Etanolo (Italian), Ethanol (ACGIH:OSHA), Ethyl alcohol (DOT:OSHA), Ethyl alcohol anhydrous, Ethyl hydrate, Ethyl hydroxide, Etylowy alkohol (Polish), Fermentation alcohol, Grain alcohol, Jaysol, Jaysol S, Methylcarbinol, Molasses alcohol, NCI-C03134, Potato alcohol, SD alcohol 23-hydrogen, Spirits of wine, Spirit, Tecsol

### Section 3 - Hazards Identification

#### Emergency Overview

Flammable (USA) Highly Flammable (EU). Irritant.  
Highly flammable.  
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:** 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

**Explosion Limits:** Lower: 3.3 % Upper: 19 %

**Autoignition Temp:** 363 °C **Flammability:** Yes

#### 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.

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**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**

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

**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                     |

**Section 9 - Physical/Chemical Properties****Appearance****Physical State**

Clear liquid

**Color**

Colorless

**Molecular Weight:** 46.07 AMU

**pH** N/A

**BP/BP Range** 78 - 80 °C

**MP/MP Range** -144 °C

**Freezing Point** N/A

**Vapor Pressure** 44.6 mmHg 20 °C

**Vapor Density** N/A

**Saturated Vapor Conc.** N/A

**SG/Density** 0.79 g/cm3

**Bulk Density** N/A

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**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  
**Partition Coefficient** N/A  
**Decomposition Temp.** N/A  
**Flash Point °F** 57 °F  
**Flash Point °C** 14 °C

Method: closed cup  
Method: closed cup

**Explosion Limits** Lower: 3.3 %

Upper: 19 %

**Flammability** N/A

**Autoignition Temp** 363 °C

**Refractive Index** 1.362

**Solubility**

**Solubility in Water:** Complete

N/A = not available

**Section 10 - Stability and Reactivity****Stability**

**Stable**

Stable.

**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**

May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

**Ingestion**

May be harmful if swallowed.

**Target Organ(s) or System(s)**

Nerves. Liver. Heart.

**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.

**RTECS Number:** KQ6300000

**Toxicity Data**

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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: Lungs, Thorax, or Respiration:Other changes.  
Liver:Fatty liver degeneration.  
Blood: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:Convulsions or effect on seizure threshold.  
Behavioral:Coma.  
Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

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:Chronic pulmonary edema.  
Lungs, Thorax, or Respiration:Dyspnea.

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:Somnolence (general depressed activity).  
Behavioral:Convulsions or effect on seizure threshold.  
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

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#### 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.

Mouse - Oral: 320 MG/KG 50W I

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors. Blood:Lymphomas including Hodgkin's disease.

Mouse - Rectal: 120 GM/KG 18W I

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Gastrointestinal:Tumors. Liver:Tumors.

Mouse - Oral: 400 GM/KG 57W I

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Gastrointestinal:Tumors.

#### ACGIH Carcinogen List

##### Rating

A4

#### Chronic Exposure - Teratogen

| Species | Dose                                                                                              | Route of Application | Exposure Time |
|---------|---------------------------------------------------------------------------------------------------|----------------------|---------------|
| Woman   | 250 MG/KG                                                                                         | Oral                 | (37W PREG)    |
|         | Result:Effects on Embryo or Fetus: Other effects to embryo.                                       |                      |               |
| Rat     | 4 GM/KG                                                                                           | Oral                 | (13D PREG)    |
|         | Result:Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). |                      |               |
| Rat     | 12 GM/KG                                                                                          | Oral                 | (9-12D PREG)  |
|         | Result:Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).              |                      |               |
| Rat     | 24 GM/KG                                                                                          | Oral                 | (14-16D PREG) |
|         | Result:Specific Developmental Abnormalities: Central nervous system.                              |                      |               |
|         | Specific Developmental Abnormalities: Other developmental abnormalities.                          |                      |               |
| Rat     | 4 GM/KG                                                                                           | Oral                 | (6-16D PREG)  |
|         | Result:Specific Developmental Abnormalities: Eye, ear.                                            |                      |               |
|         | Specific Developmental Abnormalities: Urogenital system.                                          |                      |               |
| Rat     | 44 GM/KG                                                                                          | Oral                 | (7-17D PREG)  |
|         | Result:Specific Developmental Abnormalities: Musculoskeletal system.                              |                      |               |
|         | Specific Developmental Abnormalities: Urogenital system.                                          |                      |               |
| Rat     | 20000 PPM/7H                                                                                      | Inhalation           | (1-22D PREG)  |
|         | Result:Specific Developmental Abnormalities: Other developmental abnormalities.                   |                      |               |
| Rat     | 2240 MG/KG                                                                                        | Intraperitoneal      | (9-12D PREG)  |
|         | Result:Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).   |                      |               |
| Rat     | 600 MG/KG                                                                                         | Intraperitoneal      | (8-15D PREG)  |
|         | Result:Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).              |                      |               |
| Rat     | 600 MG/KG                                                                                         | Intraperitoneal      | (8-16D PREG)  |
|         | Result:Specific Developmental Abnormalities: Craniofacial (including nose and tongue).            |                      |               |
|         | Specific Developmental Abnormalities: Musculoskeletal system.                                     |                      |               |
| Rat     | 4 GM/KG                                                                                           | Intravenous          | (6-7D PREG)   |
|         | Result:Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).   |                      |               |
|         | Effects on Embryo or Fetus: Other effects to embryo.                                              |                      |               |
|         | Specific Developmental Abnormalities: Musculoskeletal system.                                     |                      |               |
| Rat     | 4 GM/KG                                                                                           | Intravenous          | (6-7D PREG)   |
|         | Result:Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).              |                      |               |
|         | Specific Developmental Abnormalities: Musculoskeletal system.                                     |                      |               |
|         | Specific Developmental Abnormalities: Other developmental abnormalities.                          |                      |               |
| Mouse   | 162 GM/KG                                                                                         | Oral                 | (11-19D PREG) |
|         | Result:Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).   |                      |               |
| Mouse   | 5800 MG/KG                                                                                        | Oral                 | (7D PREG)     |
|         | Result:Specific Developmental Abnormalities: Central nervous system.                              |                      |               |
|         | Specific Developmental Abnormalities: Eye, ear.                                                   |                      |               |
| Mouse   | 75600 MG/KG                                                                                       | Oral                 | (6-11D PREG)  |
|         | Result:Specific Developmental Abnormalities: Urogenital system.                                   |                      |               |
|         | Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).                |                      |               |
|         | Effects on Newborn: Growth statistics (e.g., reduced weight gain).                                |                      |               |
| Mouse   | 6500 MG/KG                                                                                        | Oral                 | (9D PREG)     |
|         | Result:Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).              |                      |               |

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|                  |             |                 |               |                                                                                                                                                                                                                                           |
|------------------|-------------|-----------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mouse            | 5800 MG/KG  | Intraperitoneal | (10D PREG)    | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).<br>Specific Developmental Abnormalities: Musculoskeletal system.                                                                                    |
| Mouse            | 5800 MG/KG  | Intraperitoneal | (7D PREG)     | Result: Specific Developmental Abnormalities: Central nervous system.<br>Specific Developmental Abnormalities: Eye, ear.<br>Specific Developmental Abnormalities: Craniofacial (including nose and tongue).                               |
| Mouse            | 5622 UG/KG  | Intraperitoneal | (10D PREG)    | Result: Effects on Embryo or Fetus: Fetal death.<br>Specific Developmental Abnormalities: Eye, ear.<br>Specific Developmental Abnormalities: Musculoskeletal system.                                                                      |
| Mouse            | 4 MG/KG     | Intraperitoneal | (10D PREG)    | Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).                                                                                                                                        |
| Monkey           | 32400 MG/KG | Oral            | (2-19W PREG)  | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).<br>Specific Developmental Abnormalities: Central nervous system.<br>Specific Developmental Abnormalities: Craniofacial (including nose and tongue). |
| Monkey           | 43200 MG/KG | Oral            | (1-24W PREG)  | Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).                                                                                                                                          |
| Rabbit           | 15 MG/KG    | Intravenous     | (15-28D PREG) | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).<br>Effects on Embryo or Fetus: Other effects to embryo.                                                                                             |
| Guinea pig       | 240 MG/KG   | Oral            | (2-61D PREG)  | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).<br>Specific Developmental Abnormalities: Central nervous system.                                                                                    |
| Guinea pig       | 72 MG/KG    | Oral            | (45-62D PREG) | Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).                                                                                                                                                   |
| Domestic Animals | 94 MG/KG    | Intravenous     | (14-21W PREG) | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).                                                                                                                                                     |
| Domestic Animals | 40 MG/KG    | Intravenous     | (14-17W PREG) | Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).<br>Effects on Newborn: Biochemical and metabolic.                                                                                                   |
| Domestic Animals | 1 MG/KG     | Intravenous     | (16W PREG)    | Result: Specific Developmental Abnormalities: Respiratory system.                                                                                                                                                                         |
| Mammal           | 31500 MG/KG | Oral            | (15-35D PREG) | Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).                                                                                                                                                   |

#### Chronic Exposure - Mutagen

| Species | Dose        |                 | Cell Type  | Mutation test               |
|---------|-------------|-----------------|------------|-----------------------------|
| Human   | 220 MMOL/L  |                 | lymphocyte | DNA inhibition              |
| Human   | 1160 GM/L   |                 | lymphocyte | Cytogenetic analysis        |
| Human   | 12000 PPM   |                 | fibroblast | Cytogenetic analysis        |
| Human   | 1 PPH/72H-C |                 | leukocyte  | Cytogenetic analysis        |
| Human   | 500 PPM     |                 | lymphocyte | Sister chromatid exchange   |
| Rat     | 4 GM/KG     | Oral            |            | DNA damage                  |
| Rat     | 250 GM/KG   | Intraperitoneal | 16D        | Other mutation test systems |
| Rat     | 3 GM/KG     | Oral            |            | Other mutation test systems |
| Rat     | 2 GM/KG     | Oral            |            | Cytogenetic analysis        |
| Mouse   | 1240 MG/KG  | Intraperitoneal | 2D         | Micronucleus test           |
| Mouse   | 40 GM/KG    | Oral            |            | Cytogenetic analysis        |
| Mouse   | 420 MG/KG   | Oral            | 3W         | Sister chromatid exchange   |
| Mouse   | 5 GM/KG     | Oral            |            | SLN                         |
| Mouse   | 3720 MG/KG  | Oral            | 3D         | Dominant lethal test        |
| Mouse   | 1500 MG/KG  | Oral            | 50D        | sperm                       |
| Hamster | 100 PPM     |                 | ovary      | Cytogenetic analysis        |
| Hamster | 1 PPH       |                 | Embryo     | Cytogenetic analysis        |
| Hamster | 160 MMOL/L  |                 | ovary      | Cytogenetic analysis        |
| Hamster | 3900 MG/L   |                 | ovary      | Sister chromatid exchange   |
| Dog     | 400 UMOL/L  |                 | lymphocyte | Micronucleus test           |

#### Chronic Exposure - Reproductive Hazard

| Species | Dose        | Route of Application | Exposure Time         |
|---------|-------------|----------------------|-----------------------|
| Woman   | 41 GM/KG    | Oral                 | (41W PREG)            |
| Woman   | 8 GM/KG     | Intravenous          | (32W PREG)            |
| Woman   | 200 MG/KG   | Intravaginal         | (5D PRE)              |
| Rat     | 78 GM/KG    | Oral                 | (7-19D PREG)          |
| Rat     | 322 GM/KG   | Oral                 | (35D MALE)            |
| Rat     | 132 GM/KG   | Oral                 | (1-22D PREG)          |
| Rat     | 354 GM/KG   | Oral                 | (10D POST)            |
| Rat     | 35295 MG/KG | Oral                 | (1-15D PREG)          |
| Rat     | 15 GM/KG    | Intraperitoneal      | (8-13D PREG)          |
| Rat     | 600 MG/KG   | Intraperitoneal      | (8-15D PREG)          |
| Rat     | 3 GM/KG     | Intravenous          | (6-7D PREG)           |
| Rat     | 5 MG/KG     | Intracerebral        | (1D PRE)              |
| Rat     | 60 GM/KG    | Unreported           | (9-14D PREG)          |
| Rat     | 400 MG/KG   | Intratesticular      | (1D MALE)             |
| Rat     | 2400 MG/KG  | Intrauterine         | (10D PREG)            |
| Rat     | 642 GM/KG   | Multiple             | (1-21D PREG/23D POST) |
| Rat     | 373 GM/KG   | Multiple             | (23D POST)            |
| Mouse   | 21 GM/KG    | Oral                 | (1-21D PREG)          |
| Mouse   | 1680 GM/KG  | Oral                 | (70D MALE)            |
| Mouse   | 4300 MG/KG  | Intraperitoneal      | (10D PREG)            |
| Dog     | 21600 MG/KG | Oral                 | (1-60D PREG)          |
| Dog     | 280 GM/KG   | Oral                 | (1-62D PREG)          |
| Dog     | 221 GM/KG   | Oral                 | (1-47D PREG)          |
| Dog     | 100 MG/KG   | Intratesticular      | (1D MALE)             |
| Monkey  | 78 GM/KG    | Oral                 | (4-23W PREG)          |

Result: Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects. Effects on Newborn: Drug dependence.

Result: Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects.

Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Result: Effects on Newborn: Biochemical and metabolic.

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Result: Maternal Effects: Parturition. Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.

Result: Effects on Newborn: Biochemical and metabolic.

Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated). 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: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Result: Effects on Newborn: Behavioral. Effects on Newborn: Physical.

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Result: Effects on Fertility: Other measures of fertility.

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death.

Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

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).

Result: Effects on Newborn: Behavioral. Effects on Newborn: Physical.

Result: Effects on Newborn: Biochemical and metabolic. Effects on Newborn: Behavioral.

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Result: Effects on Newborn: Stillbirth. Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Result: Effects on Fertility: Abortion.

Result: Paternal Effects: Testes, epididymis, sperm duct.

Result: Effects on Fertility: Abortion.

|                                                                                                                                                               |            |      |                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|----------------------|
| Monkey                                                                                                                                                        | 400 MG/KG  | Oral | (2-21W PREG)         |
| Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).                                                                                    |            |      |                      |
| Monkey                                                                                                                                                        | 206 GM/KG  | Oral | (90D PRE)            |
| Result: Maternal Effects: Menstrual cycle changes or disorders.                                                                                               |            |      |                      |
| Rabbit                                                                                                                                                        | 3945 MG/KG | Oral | (1D PRE)             |
| Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).         |            |      |                      |
| Rabbit                                                                                                                                                        | 3750 MG/KG | Oral | (1D PRE)             |
| Result: Effects on Fertility: Other measures of fertility                                                                                                     |            |      |                      |
| Pig                                                                                                                                                           | 2648 GM/KG | Oral | (78W PRE/1-16W PREG) |
| Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Growth statistics (e.g., reduced weight gain). |            |      |                      |
| Guinea pig                                                                                                                                                    | 90 GM/KG   | Oral | (1-68D PREG)         |
| Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.                                                    |            |      |                      |
| Guinea pig                                                                                                                                                    | 264 GM/KG  | Oral | (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:** **Value:**  
96.0 h 13,000 mg/l

#### Test Type

EC50 Daphnia

#### Species

Daphnia magna

**Time:** **Value:**  
48.0 h 9.3 mg/l

#### Test Type

LC50 Fish

#### Species

Onchorhynchus mykiss (Rainbow trout)

**Time:** **Value:**  
96.0 h 10,400 mg/l

#### Test Type

LC50 Fish

#### Species

Pimephales promelas (Fathead minnow)

**Time:** **Value:**  
96.0 h 15,300 mg/l

#### Test Type

LC50 Fish

#### Species

other fish

**Time:** **Value:**  
24.0 h 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.

**Risk Statements** **R:** 11

Highly flammable.

**Safety Statements** **S:** 7 16

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.

**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. Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

