

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

PRODUCT NAME: FATAL-PLUS® SOLUTION
PRODUCT DESCRIPTION: Fatal-Plus is a euthanasia solution suitable for all animals, regardless of species. It is administered by intravenous injection.

MANUFACTURER: Vortech Pharmaceuticals, Ltd.
ADDRESS: 6851 Chase Road
Dearborn MI 48126

PHONE NUMBER: (800) 521-4686
(313) 584-4088

OTHER NUMBER: Poison Control Center : 1-800-222-1222

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is a controlled substance. The main health hazard associated with overexposure during normal occupational use and handling is irritation of contaminated tissues. This product may be toxic if swallowed or inhaled. This product is not flammable. When involved in a fire, this material may decompose and produce irritating vapors and toxic compounds (including e.g. carbon oxides, nitrogen oxides, and sodium oxides). This product is not reactive. Large quantities released to the aquatic and terrestrial environment may have an adverse effect.

Routes of Entry

By eye contact, skin contact, ingestion or inhalation

Carcinogenic Status

Ethyl Alcohol: IARC (International Agency for Research on Cancer) has classified Alcoholic beverages as Group 1 (indicating in their evaluation that the agent is carcinogenic to humans). However, occupational handling or manufacturer's specified use of this product is not expected to result in relevant exposures.

Target Organs

This product effects the, eyes, skin, respiratory tract, gastrointestinal tract, liver and cardiovascular, central nervous and reproductive systems.

Health Effects – Eyes

This product may cause eye irritation, if contact occurs.

Health Effects – Skin

This product may cause skin irritation after prolonged and repeated contact occurs.

Health Effects – Ingestion

Ingestion of this product may cause adverse gastrointestinal, cardiovascular, liver, central nervous system and reproductive effects. Symptoms include: drowsiness, headache, mental depression, dizziness, confusion, lack of muscular control, impaired judgement and sedation. In cases of severe overdoses, this product may cause respiratory and cardiovascular suppression, coma and death due to respiratory and circulatory failure.

Health Effects – Inhalation

This product may cause irritation to the respiratory tract if inhaled.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Product Use: Veterinary product

Chemical Formula: Mixture

| CHEMICAL NAME | CAS NUMBER | CONCENTRATION |
|----------------------|------------|---------------|
| Pentobarbital Sodium | 57-33-0 | 390 mg/ml |
| Propylene Glycol | 57-55-6 | 0.01 ml/ml |
| Ethyl Alcohol | 64-17-5 | 0.29 ml/ml |
| Benzyl Alcohol | 100-51-6 | 0.02 ml/ml |

This MSDS is written to provide health and safety information to individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient.

SECTION 4. FIRST AID MEASURES

Eyes

If this product comes into contact with the eyes, immediately wash the affected eye with water for at least fifteen minutes or until the irritation ceases. If irritation continues, seek medical attention.

Skin

If this product comes into contact with the skin, wash the affected area thoroughly with soap and water. If redness or soreness continues, seek medical attention.

Ingestion

If this product is ingested, **DO NOT** induce vomiting, unless directed to do so by a physician and **DO NOT** attempt to give anything by mouth to a seizing, drowsy or unconscious person. Seek medical attention **IMMEDIATELY**.

Inhalation

If this product is inhaled, move to an area of fresh air. If irritation occurs or persists, consult a physician. If person has any trouble breathing, get medical attention **IMMEDIATELY** or if person has stopped breathing administer CPR.

SECTION 5. FIRE FIGHTING MEASURES

Extinguishing Media

Use extinguishing media appropriate for surrounding materials, carbon dioxide (CO₂), powder or water.

Unusual Fire and Explosion Hazards

None known

Protective Equipment for Fire-Fighting

Wear full protective clothing and self-contained breathing apparatus (SCBA)

SECTION 6. ACCIDENTAL RELEASE MEASURES

Wear appropriate protective clothing. Wipe up and transfer into suitable containers for recovery or disposal. This product **MUST NOT** enter drains or waterways. Notify authorities if spill has entered water ways or sewer system or has contaminated soil or vegetation. The product must be disposed of in accordance with federal, state and local regulations for DEA Schedule II controlled substances.

SECTION 7. HANDLING AND STORAGE

This product must be stored in original containers and in a cool dry place. The product must be stored in accordance with federal, state and local regulations for DEA Schedule II controlled substances. Avoid contact with skin, eyes and clothing. Wash hands thoroughly after dispensing and before eating, or drinking.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

| Chemical Name | CAS# | Exposure Limits in Air | | | | | | | | | |
|----------------------|----------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| | | ACGIH-TLVS | | OSHA-PELS | | NIOSH-RELS | | NIOSH | AIHA WEELS | | OTHER |
| | | TWA mg/m ³ | STEL mg/m ³ | TWA mg/m ³ | STEL mg/m ³ | TWA mg/m ³ | STEL mg/m ³ | IDLH mg/m ³ | TWA mg/m ³ | STEL mg/m ³ | mg/m ³ |
| Pentobarbital Sodium | 57-33-0 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Propylene Glycol | 57-55-6 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Ethyl Alcohol | 64-17-5 | 1880 | NE | 1900 | NE | 1900 | NE | 8237 (based on LEL) | NE | NE | NE |
| Benzyl Alcohol | 100-51-6 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |

NE – Not Established

Respiratory Protection: A respirator is not required for routine use of this product.

MSDS Revision Date: May 28, 2015

Supersedes MSDS Dated: 09/26/96

Eye Protection: Eye protection is not needed during normal use. In case of situations in which excessive splashes or sprays may be generated, wear splash goggles.

Hand Protection: In case of prolonged skin contact wear rubber gloves, either natural rubber, neoprene or nitrile gloves.

Body Protection: Use of lightweight cotton gown or other medical attire is recommended.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|----------------|
| Physical State | Liquid |
| Color | Clear Blue |
| Odor | Unknown |
| pH | 9.6-11.0 |
| Boiling Point | Not Applicable |
| Specific Gravity (H₂O=1) | 1.105 |
| Vapor Pressure | Not Applicable |
| Solubility in Water | Soluble |
| Vapor Density | Not Applicable |
| Flash Point (PMCC)(°C/F) | Not Flammable |
| Melting Point (°C/F) | Not Applicable |
| Explosion Limits(%) | Not Applicable |

SECTION 10. STABILITY AND REACTIVITY

| | |
|---|------------------------------------|
| Stability | Stable under normal conditions. |
| Incompatible Materials / Conditions to Avoid | Open flames and high temperatures. |
| Materials to Avoid | Oxidizing agents |
| Hazardous Polymerization | Will not occur |
| Hazardous Decomposition Products | Carbon oxides (CO _x) |

SECTION 11. TOXICOLOGICAL INFORMATION

The toxicological properties of this product have not been fully characterized in humans or animals. The information presented below pertains to the following individual ingredients in this formulation, unless indicated otherwise.

Acute Toxicity

Pentobarbital Sodium: Oral LD50 (rat) 118 mg/kg; (dog) 65 mg/kg
 Propylene Glycol: Oral LD50 (rat) 21 to 33.7 g/kg; (dog) 10 to 20 g/kg
 Dermal LD50 (rabbit) 20.8 g/kg

Ethyl Alcohol: Oral LD50 (rat) 7060 mg/kg
Benzyl Alcohol: Oral LD50 (rat) 1230 mg/kg
Dermal LD50 (rabbit) 2000 mg/kg
Inhalation LC50 (rat) 74.187 mg/l, 4h

Specific Target Organ Systemic Toxicity (single and repeat)

Pentobarbital Sodium: Causes central nervous system effects similar to alcohol inebriation and adverse liver effects. Ingestion can cause respiratory and cardiovascular depression, coma and death.

Propylene Glycol: Caused no adverse reactions in monkeys or rats after exposure to saturated atmospheres for prolonged periods of time.

Ethyl Alcohol: Chronic exposure can result in adverse liver, heart and central nervous system effects.

Benzyl Alcohol: Can cause adverse central nervous system effects.

Serious Eye Damage / Eye Irritation

Propylene Glycol: Causes slight eye irritation.

Ethyl Alcohol: Causes severe eye irritation.

Benzyl Alcohol: Causes moderate to severe eye irritation.

Skin Corrosion/irritation

Propylene Glycol: Causes mild skin irritation.

Ethyl Alcohol: Causes mild skin irritation.

Benzyl Alcohol: Causes mild to moderate skin irritation.

Respiratory or Skin Sensitization

No relevant studies identified.

Carcinogenicity

This product has not been evaluated for carcinogenicity. Ethyl Alcohol: IARC (International Agency for Research on Cancer) has classified Alcoholic beverages as Group 1 (indicating in their evaluation that the agent is carcinogenic to humans). However, occupational handling or manufacturer's specified use of this product is not expected to result in relevant exposures.

Mutagenicity / Genotoxicity

Pentobarbital (base) was positive in the mouse micronucleus assay, mouse cell DNA inhibition test, hamster cytogenetic assay, and in the hamster dominant test.

Propylene Glycol was negative in a bacterial mutagenicity study (Ames).

Benzyl Alcohol in the Ames testing did not show mutagenic activity and mixed results both positive and negative were observed from other in-vitro genotoxicity assays. Benzyl Alcohol showed no genotoxicity during in-vivo testing. The weight of the evidence indicates that it is not mutagenic or clastogenic.

Reproductive / Developmental Toxicity

Pentobarbital Sodium: Pentobarbital (base) studies indicate that pentobarbital sodium may affect the developing fetus. Placental transfer in humans has been documented. Neonates from mothers exposed to therapeutic doses of barbiturates have shown blood coagulation disorders and drug withdrawal symptoms. Doses of 600-750 mg administered intravenously to mothers before delivery caused moderate to severe neonatal depression in 40% of the infants with a delay in normal respiration. Doses up to 300 mg showed no appreciable effects.

Propylene Glycol: Caused decreased food consumption, retarded growth, smaller litters, changes in breeding patterns, and inhibited weaning in rats that were fed 30% propylene glycol through six generations; however, this may have been due to nutritional insufficiency. It was not teratogenic in rabbits, monkeys or chickens.

Ethyl Alcohol: Ingestion of ethyl alcohol during pregnancy has caused adverse reproductive effects (fetal alcohol syndrome) but only at doses that are maternally toxic.

SECTION 12. ECOLOGICAL INFORMATION

There is no data for this product or its formulation. The information provided is for the individual ingredients within the product. This product is toxic to wildlife. Birds and mammals feeding on animals treated with this product may be killed.

Mobility

No relevant studies found.

Persistence/Degradability

No relevant studies found.

Bio-accumulation

No relevant studies found.

Ecotoxicity

Pentobarbital Sodium: 96-hr LC50 (fathead minnow) 49.5mg/L

Propylene Glycol: 96-hr LC50 (sheepshead minnow) 23,800 mg/L

Propylene Glycol: 48-hr EC50 (daphnid) >43,500 mg/L

Propylene Glycol: 72-hr EC50 (green algae) >19,000 mg/L

Benzyl alcohol: 96-hr LC50 (Bluegill sunfish) 10mg/L

Benzyl alcohol: 48-hr EC50 (Daphnia Magna) 15.2 mg/L

Benzyl alcohol: 3-hr EC50 (Chlorella pyrenoidosa - Algae) 95 mg/L

SECTION 13. DISPOSAL CONSIDERATIONS

MATERIAL WASTE: Disposal must be in accordance with applicable federal, state and/ or local regulations concerning US DEA Schedule II controlled substances. Incineration is the preferred method of disposal, when appropriate.

EUTHANIZED ANIMALS: Animal carcasses must be properly disposed of by deep burial, incineration, or any other method in compliance with state and local laws, to prevent consumption of carcass material by scavenging wildlife.

EMPTY CONTAINER DISPOSAL: Empty containers must be triple rinsed prior to disposal and in accordance with applicable federal, state, and/or local regulations.

SECTION 14. TRANSPORTATION INFORMATION

This material is not subject to the transportation regulations of DOT, IATA, IMO, and the ADR.

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

| INGREDIENT | TSCA |
|------------------|------|
| Propylene Glycol | X |
| Ethyl Alcohol | X |
| Benzyl Alcohol | X |

U.S. STATE REGULATIONS

| INGREDIENT | CA PROP 65 | CARTK | NJRTK | CTR TK | MARTK | PARTK | MNRTK | MIR TK | RIR TK |
|----------------------|------------|-------|-------|--------|-------|-------|-------|--------|--------|
| Pentobarbital Sodium | D | | 3726 | | | | | | |
| Propylene Glycol | | | 3595 | | | X | X | | X |
| Ethyl Alcohol | C D | X | 0844 | | X | X | X | | X |
| Benzyl Alcohol | | | | | X | X | X | | |

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).