MATERIAL SAFETY DATA SHEET

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Section 1 - Product and Company Information

Product Name	B-ESTRADIOL
Product Number	E8875
Brand	SIGMA
Company	Sigma-Aldrich Canada, Ltd
Street Address	2149 Winston Park Drive
City, State, Zip, Country	Oakville ON L6H 6J8 CA
Technical Phone:	9058299500
Emergency Phone:	800-424-9300
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Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
17B-ESTRADIOL ESTROGEN	50-28-2	No

Formula C18H24O2

Synonyms Altrad * Bardiol * Dihydrofollicular hormone * Dihydrofolliculin * Dihydromenformon * Dihydrotheelin * 3,17-beta-Dihydroxyestra-1,3,5(10)-triene * 3,17-beta-Dihydroxy-1,3,5(10)-estratriene * Dihydroxyestrin * 3,17-beta-Dihydroxyoestra-1,3,5-triene * 3,17-beta-Dihydroxy-1,3,5(10)-oestratriene * Dihydroxyoestrin * Dimenformon * Dimenformon prolongatum * Diogyn * Diogynets * E(sub 2) * 3,17-Epidihydroxyestratriene * Estradiol-17-beta * beta-Estradiol * 3,17-beta-Estradiol * 17-beta-Estradiol * D-3,17-beta-Estradiol * Estraldine * Estra-1,3,5(10)-triene-3,17-beta-diol * 17-beta-Estra-1,3,5(10)-triene-3,17-diol * 1,3,5-Estratriene-3,17-beta-diol * Estrovite * Femestral * Femogen * Gynergon * Gynestrel * Gynoestryl * Lamdiol * Macrodiol * Macrol * Microdiol * Nordicol * NSC-9895 * Oestergon * Oestradiol * alpha-Oestradiol * beta-Oestradiol * 3,17-beta-Oestradiol * cis-Oestradiol * d-Oestradiol * D-3,17-beta-Oestradiol * Oestradiol R * Oestradiol-17-beta *

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic.
May cause cancer.
Target organ(s): Female reproductive system. Male reproductive system.

HMIS RATING

HEALTH: 0*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

*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 immediately.

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 skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Use only in a chemical fume hood. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

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

Section 9 - Physical/Chemical Properties

Appearance	Color: White Form: Powder

Property	Value	At Temperature or Pressure
Molecular Weight	272.39 AMU	
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	176 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
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	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	Degree of Rotation: 10 g/l Solvent: EtOH/H2O	

	+94 - +79 (+/-2)	1:1
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

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

TARGET ORGAN(S) OR SYSTEM(S)
Female reproductive system. Male reproductive system.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CHRONIC EXPOSURE - CARCINOGEN
Result: There is sufficient evidence for the carcinogenicity of b-estradiol in experimental animals. In the absence of adequate data in humans, it is reasonable, for practical purposes, to regard b-estradiol as if it presented a carcinogenic risk to humans. Studies in humans strongly suggest that the administration of estrogens is causally related to an increased incidence of endometrial carcinoma; there is no evidence that b-estradiol is different from other estrogens in this respect. IARC Monograph, volume 21, page 312, 1979. The National Toxicology Program (Tenth Report on Carcinogens) has determined that steroidal estrogens are known to be human carcinogens based on sufficient evidence of carcinogenicity in humans, which indicates a causal relationship between exposure to steroidal estrogens and human cancer.

Species: Rat
Route of Application: Intraperitoneal
Dose: 1400 MG/KG
Exposure Time: 13W
Frequency: I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Endocrine:Tumors.

Species: Rat
Route of Application: Implant
Dose: 100 MG/KG

Exposure Time: 52W
Frequency: C
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Oral
Dose: 84 MG/KG
Exposure Time: 20W
Frequency: C
Result: Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic Effects: Uterine tumors

Species: Guinea pig
Route of Application: Subcutaneous
Dose: 7 MG/KG
Exposure Time: 12W
Frequency: I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic Effects: Uterine tumors

Species: Guinea pig
Route of Application: Implant
Dose: 1200 UG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic:Tumors at site or application.

Species: Hamster
Route of Application: Implant
Dose: 200 MG/KG
Result: Tumorigenic:Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder:Kidney tumors.

Species: Hamster
Route of Application: Implant
Dose: 360 MG/KG
Exposure Time: 15W
Frequency: I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder:Kidney tumors.

Species: Guinea pig
Route of Application: Implant
Dose: 2400 UG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic Effects: Uterine tumors

Species: Mouse
Route of Application: Oral
Dose: 58 MG/KG
Exposure Time: 82W
Frequency: C
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Guinea pig
Route of Application: Implant
Dose: 40 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic Effects: Uterine tumors

Species: Guinea pig

Route of Application: Implant
Dose: 100 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic Effects: Uterine tumors

Species: Mouse
Route of Application: Oral
Dose: 44 MG/KG
Exposure Time: 52W
Frequency: I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors. Tumorigenic:Tumor types after systemic administration not seen spontaneously.

Species: Rat
Route of Application: Implant
Dose: 62500 UG/KG
Exposure Time: 36W
Frequency: I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Endocrine:Tumors. Skin and Appendages: Other: Tumors.

Species: Hamster
Route of Application: Implant
Dose: 160 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder:Tumors. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma.

Species: Mouse
Route of Application: Implant
Dose: 30 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Implant
Dose: 34 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

IARC CARCINOGEN LIST
Rating: Group 1 Group 1

NTP CARCINOGEN LIST
Rating: Known to be a human carcinogen.

Rating: Anticipated to be a carcinogen.

CHRONIC EXPOSURE - TERATOGEN
Result: May cause congenital malformation in the fetus.

Species: Rat
Dose: 14400 NG/KG
Route of Application: Subcutaneous
Exposure Time: (5-16D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 6250 UG/KG
Route of Application: Subcutaneous

Exposure Time: (16-20D PREG)
Result: Specific Developmental Abnormalities: Urogenital system.

Species: Rat
Dose: 60 MG/KG
Route of Application: Intramuscular
Exposure Time: (15-16D PREG)
Result: Specific Developmental Abnormalities: Urogenital system.

Species: Rat
Dose: 60 MG/KG
Route of Application: Intramuscular
Exposure Time: (19-20D PREG)
Result: Specific Developmental Abnormalities: Endocrine system.

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 5 UMOL/L
Cell Type: lymphocyte
Mutation test: Micronucleus test

Species: Human
Dose: 10 NMOL/L
Cell Type: mammary gland
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 10 UMOL/L
Cell Type: lymphocyte
Mutation test: DNA inhibition

Species: Human
Dose: 20 MG/KG
Cell Type: fibroblast
Mutation test: Other mutation test systems

Species: Human
Dose: 1 MG/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Human
Dose: 1 MG/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Human
Dose: 20 MG/L
Cell Type: fibroblast
Mutation test: SLN

Species: Rat
Route: Oral
Dose: 21 MG/KG
Exposure Time: 6W
Mutation test: Morphological transformation.

Species: Rat
Dose: 10 NMOL/L
Cell Type: Other cell types
Mutation test: DNA

Species: Rat
Route: Subcutaneous
Dose: 10500 NG/KG
Mutation test: Other mutation test systems

Species: Rat
Dose: 100 MMOL/L
Cell Type: liver
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Subcutaneous
Dose: 18500 UG/KG
Exposure Time: 5D
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Parenteral
Dose: 10 UG/KG
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Intraperitoneal
Dose: 40 UG/KG
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Subcutaneous
Dose: 800 NG/KG
Exposure Time: 4D
Mutation test: Other mutation test systems

Species: Rat
Route: Parenteral
Dose: 10 MG/KG
Mutation test: Cytogenetic analysis

Species: Mouse
Dose: 100 NMOL/L
Cell Type: Other cell types
Mutation test: Micronucleus test

Species: Mouse
Route: Intraperitoneal
Dose: 10 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 20 UMOL/L
Cell Type: fibroblast
Mutation test: Morphological transformation.

Species: Mouse
Route: Subcutaneous
Dose: 1190 UG/KG
Mutation test: Unscheduled DNA synthesis

Species: Mouse
Route: Oral
Dose: 40 UG/KG
Mutation test: DNA inhibition

Species: Mouse
Dose: 1 MG/L
Cell Type: Embryo
Mutation test: Cytogenetic analysis

Species: Mouse
Dose: 10 UMOL/L
Cell Type: Other cell types
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Subcutaneous
Dose: 200 MG/L
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Intraperitoneal
Dose: 10 MG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Subcutaneous
Dose: 250 MG/KG
Mutation test: sperm

Species: Hamster
Dose: 10 UMOL/L
Cell Type: Embryo
Mutation test: Micronucleus test

Species: Hamster
Dose: 3 MG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Hamster
Route: Subcutaneous
Dose: 200 MG/KG
Exposure Time: 2W
Mutation test: DNA damage

Species: Hamster
Dose: 6 MG/KG
Cell Type: Embryo
Mutation test: Other mutation test systems

Species: Hamster
Dose: 50 UMOL/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Route: Subcutaneous
Dose: 160 MG/KG
Exposure Time: 20W
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 10 UMOL/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 10 MG/L
Cell Type: Embryo
Mutation test: SLN

Species: Hamster
Dose: 50 UMOL/L
Cell Type: fibroblast
Mutation test: SLN

Species: Hamster
Dose: 40 UMOL/L
Cell Type: lung
Mutation test: SLN

Species: Guinea pig
Dose: 52 NMOL/L
Cell Type: kidney
Mutation test: DNA

Species: Guinea pig
Dose: 52 NMOL/L
Cell Type: lung
Mutation test: DNA

Species: Domestic Animals
Dose: 10 UMOL/L
Cell Type: Other cell types
Mutation test: Micronucleus test

Species: Mammal
Dose: 5 NMOL/L
Cell Type: lymphocyte
Mutation test: DNA

Species: Rabbit
Dose: 100 NMOL/L
Cell Type: Other cell types
Mutation test: Unscheduled DNA synthesis

Species: Frog
Route: Parenteral
Dose: 40 MG/KG
Mutation test: Unscheduled DNA synthesis

Species: Chicken
Route: Intramuscular
Dose: 25 MG/KG
Mutation test: Other mutation test systems

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: May cause reproductive disorders.

Species: Woman
Dose: 4400 UG/KG
Route of Application: Oral
Exposure Time: (31W PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Rat
Dose: 1 GM/KG

Route of Application: Oral
Exposure Time: (4-8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Fertility: Abortion.

Species: Rat
Dose: 750 UG/KG
Route of Application: Oral
Exposure Time: (3D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Rat
Dose: 875 UG/KG
Route of Application: Oral
Exposure Time: (7D PRE)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat
Dose: 4195 NG/KG
Route of Application: Oral
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Rat
Dose: 1280 NG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D MALE)
Result: Paternal Effects: Other effects on male.
Endocrine:Change in LH.

Species: Rat
Dose: 2400 NG/KG
Route of Application: Subcutaneous
Exposure Time: (3D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Rat
Dose: 205 UG/KG
Route of Application: Subcutaneous
Exposure Time: (5D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 20 UG/KG
Route of Application: Subcutaneous
Exposure Time: (4D PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Rat
Dose: 10500 NG/KG
Route of Application: Subcutaneous
Exposure Time: (7D PRE)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat
Dose: 15300 NG/KG
Route of Application: Subcutaneous

Exposure Time: (1-9D PREG)
Result: 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: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rat
Dose: 500 UG/KG
Route of Application: Subcutaneous
Exposure Time: (1D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Rat
Dose: 10 UG/KG
Route of Application: Intravenous
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Rat
Dose: 2 UG/KG
Route of Application: Intramuscular
Exposure Time: (4D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Rat
Dose: 1800 MG/KG
Route of Application: Intramuscular
Exposure Time: (15-20D PREG)
Result: Maternal Effects: Ovaries, fallopian tubes.

Species: Rat
Dose: 6720 NG/KG
Route of Application: Intramuscular
Exposure Time: (14D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands.

Species: Rat
Dose: 70 UG/KG
Route of Application: Intramuscular
Exposure Time: (14D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders. Maternal Effects: Other effects.

Species: Rat
Dose: 4 UG/KG
Route of Application: Parenteral
Exposure Time: (14-17D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 1600 UG/KG
Route of Application: Parenteral
Exposure Time: (3W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat

Dose: 3600 NG/KG
Route of Application: Implant
Exposure Time: (90D MALE)
Result: Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands.

Species: Rat
Dose: 437 UG/KG
Route of Application: Implant
Exposure Time: (91D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 262 UG/KG
Route of Application: Implant
Exposure Time: (91D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands. Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

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

Species: Rat
Dose: 25 NG/KG
Route of Application: Intrauterine
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 219 MG/KG
Route of Application: Oral
Exposure Time: (52W PRE)
Result: Maternal Effects: Ovaries, fallopian tubes. Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 667 NG/KG
Route of Application: Oral
Exposure Time: (3D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 4 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (5D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Mouse
Dose: 10 MG/KG
Route of Application: Subcutaneous
Exposure Time: (5D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Prostate, seminal vessicle, Cowper's gland,

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

Species: Mouse
Dose: 1 MG/KG
Route of Application: Subcutaneous
Exposure Time: (5D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

Species: Mouse
Dose: 20 MG/KG
Route of Application: Subcutaneous
Exposure Time: (19D PREG)
Result: Effects on Newborn: Delayed effects.

Species: Mouse
Dose: 12 UG/KG
Route of Application: Subcutaneous
Exposure Time: (1-3D PREG)
Result: Effects on Fertility: Other measures of fertility

Species: Mouse
Dose: 14400 NG/KG
Route of Application: Subcutaneous
Exposure Time: (4-6D PREG)
Result: Maternal Effects: Uterus, cervix, vagina. Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Mouse
Dose: 204 NG/KG
Route of Application: Subcutaneous
Exposure Time: (3D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 2 UG/KG
Route of Application: Subcutaneous
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 9600 UG/KG
Route of Application: Parenteral
Exposure Time: (4-6D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Mouse
Dose: 4800 UG/KG
Route of Application: Parenteral
Exposure Time: (4-6D PREG)
Result: Effects on Fertility: Other measures of fertility

Species: Mouse
Dose: 4 UG/KG
Route of Application: Parenteral
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina.

Species: Mouse
Dose: 1720 UG/KG
Route of Application: Implant
Exposure Time: (16-21D PREG)
Result: Maternal Effects: Parturition. Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Monkey
Dose: 10 MG/KG
Route of Application: Oral
Exposure Time: (1-6D PREG)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Monkey
Dose: 30 UG/KG/30M
Route of Application: Inhalation
Exposure Time: (60D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Rabbit
Dose: 60 UG/KG
Route of Application: Oral
Exposure Time: (8D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands.

Species: Rabbit
Dose: 50 UG/KG
Route of Application: Oral
Exposure Time: (1D PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Rabbit
Dose: 90 UG/KG
Route of Application: Subcutaneous
Exposure Time: (6-11D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rabbit
Dose: 45 MG/KG
Route of Application: Subcutaneous
Exposure Time: (1-3D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Rabbit
Dose: 45 UG/KG
Route of Application: Subcutaneous
Exposure Time: (5-7D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Rabbit

Dose: 30 UG/KG
Route of Application: Intramuscular
Exposure Time: (18-20D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Embryo or Fetus: Fetal death.

Species: Rabbit
Dose: 5 UG/KG
Route of Application: Intramuscular
Exposure Time: (1-3D PREG)
Result: Effects on Fertility: Other measures of fertility

Species: Rabbit
Dose: 190 UG/KG
Route of Application: Unreported
Exposure Time: (1-19D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Pig
Dose: 7692 NG/KG
Route of Application: Parenteral
Exposure Time: (9-10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Hamster
Dose: 90 UG/KG
Route of Application: Subcutaneous
Exposure Time: (1-9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Hamster
Dose: 900 UG/KG
Route of Application: Subcutaneous
Exposure Time: (1-9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Hamster
Dose: 160 MG/KG
Route of Application: Implant
Exposure Time: (50W MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Gerbil
Dose: 15 MG/KG
Route of Application: Subcutaneous
Exposure Time: (15D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands.

Species: Domestic Animals
Dose: 14 UG/KG
Route of Application: Subcutaneous

Exposure Time: (1D PRE)
Result: Effects on Fertility: Other measures of fertility

Species: Cattle, Horse
Dose: 126 UG/KG
Route of Application: Subcutaneous
Exposure Time: (48W PRE/1-28D PREG)
Result: Maternal Effects: Menstrual cycle changes or disorders.
Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Cattle, Horse
Dose: 900 UG/KG
Route of Application: Implant
Exposure Time: (26W MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Cattle, Horse
Dose: 1 MG/KG
Route of Application: Implant
Exposure Time: (26-47D POST)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Cattle, Horse
Dose: 147 MG/KG
Route of Application: Implant
Exposure Time: (82D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Paternal Effects: Other effects on male.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: T
Indication of Danger: Toxic.
R: 45
Risk Statements: May cause cancer.

S: 53 45
Safety Statements: Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Toxic.
Risk Statements: May cause cancer.
Safety Statements: Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Target organ(s): Female reproductive system. Male reproductive system.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65
California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer.

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: No
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

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.