10H-Phenothiazine-10-propanamine, 2-chloro-N,N-dimethyl- (cas 50-53-3) MSDS

**MSDS**

**CAS** : 50-53-3

**SYNONYMS** :

* Aminazin
* Aminazine
* Ampliaxtil
* BC 135
* Chlorerazin
* Chloro-3 (dimethylamino-3 propyl)-10 phenothiazine
* 2-Chloro-10-(3-(dimethylamino)propyl)phenothiazine
* Chlorpromazin
* Chlorpromazine
* 2-Chloro-10 (3-dimetilaminopropil)fenotiazina
* Chlorpromazina
* CP2
* Elmarin
* Fenactil
* Fenaktyl
* Fraction AB
* Largactil
* Largactilothiazine
* Largactyl
* Megaphen
* Novomazina
* Phenactyl
* 10H-Phenothiazine-10-propanamine, 2-chloro-N,N-dimethyl-
* Prazil
* Promactil
* Promazil
* Propaphenin
* Prozil
* 4560 R.P.
* SKF 2601-A
* Thorazine
* Tornado
* Wintermin
*** CHEMICAL IDENTIFICATION ***

RTECS NUMBER : SN8925000
CHEMICAL NAME : Phenothiazine, 2-chloro-10-(3-(dimethylamino)propyl)-
CAS REGISTRY NUMBER : 50-53-3
LAST UPDATED : 199801
DATA ITEMS CITED : 94
MOLECULAR FORMULA : C17-H19-Cl-N2-S
MOLECULAR WEIGHT : 318.89
WISWESSER LINE NOTATION : T C666 BN ISJ B3141 EG
COMPOUND DESCRIPTOR : Drug
Mutagen
Reproductive Effector
Human

SYNONYMS/TRADE NAMES :
* Aminazin
* Aminazine
* Ampliactil
* BC 135
* Chlorderazin
* Chloro-3 (dimethylamino-3 propyl)-10 phenothiazine
* 2-Chloro-10-(3-(dimethylamino)propyl)phenothiazine
* Chlorpromazin
* Chlorpromazine
* 2-Chloro-10 (3-dimetilaminopropil)fenotiazina
* Cloprimazina
* CPZ
* Elmarin
* Fenactil
* Fenaktyl
* Fraction AB
* Largactil
* Largactilothiazine
* Largactyl
* Megaphen
* Novomazina
* Phenactyl
* 10H-Phenothiazine-10-propanamine, 2-chloro-N,N-dimethyl-
* Prazil
* Promactil
* Promazil
*** HEALTH HAZARD DATA ***

** ACUTE TOXICITY DATA **

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - woman
DOSE/DURATION : 240 mg/kg/30D-I

TOXIC EFFECTS :
- Blood - agranulocytosis
- Blood - changes in leukocyte (WBC) count
- Nutritional and Gross Metabolism - body temperature increase

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - woman
DOSE/DURATION : 16800 ug/kg/3W-I

TOXIC EFFECTS :
- Blood - agranulocytosis

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - woman
DOSE/DURATION : 240 mg/kg/30D

TOXIC EFFECTS :
- Blood - agranulocytosis
- Skin and Appendages - dermatitis, allergic (after systemic exposure)

REFERENCE :
TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - man
DOSE/DURATION : 8900 ug/kg
TOXIC EFFECTS :
  Lungs, Thorax, or Respiration - dyspnea
REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - man
DOSE/DURATION : 217 mg/kg/19D
TOXIC EFFECTS :
  Blood - agranulocytosis
  Skin and Appendages - dermatitis, allergic (after systemic exposure)
REFERENCE :
  Volume(issue)/page/year: 46,341,1985

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - infant
DOSE/DURATION : 20 mg/kg
TOXIC EFFECTS :
  Vascular - BP lowering not characterized in autonomic section
  Behavioral - somnolence (general depressed activity)
REFERENCE :
  AJDCAI American Journal of Diseases of Children. (AMA, 535 N. Dearborn St., Chicago, IL 60610) V.1-80(3), 1911-50; V.100- 1960-
  Volume(issue)/page/year: 130,507,1976

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Human - woman
DOSE/DURATION : 200 ug/kg
TOXIC EFFECTS :
  Behavioral - sleep
liver - jaundice, other or unclassified

REFERENCE:
NYSJAM New York State Journal of Medicine. (Medical Soc. of the State of New York, POB 5405, Lake Success, NY 11042) V.1- 1901-
Volume(issue)/page/year: 57,1922,1957

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Oral
SPECIES OBSERVED        : Human
DOSE/DURATION           : 8570 ug/kg/12D-I
TOXIC EFFECTS :
Behavioral - wakefulness
Behavioral - tremor
Behavioral - muscle weakness

REFERENCE:
Volume(issue)/page/year: 22,93,1972

TYPE OF TEST            : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE       : Oral
SPECIES OBSERVED        : Rodent - rat
DOSE/DURATION           : 142 mg/kg
TOXIC EFFECTS :
Nutritional and Gross Metabolic - body temperature decrease

REFERENCE:
Volume(issue)/page/year: 18,261,1968

TYPE OF TEST            : LC50 - Lethal concentration, 50 percent kill
ROUTE OF EXPOSURE       : Inhalation
SPECIES OBSERVED        : Rodent - rat
DOSE/DURATION           : 209 mg/m3/2H
TOXIC EFFECTS :
Behavioral - muscle weakness
Cardiac - pulse rate increase, without fall in BP
Blood - leukopenia

REFERENCE:
TPKVAL Toksikologiya Novykh Promyshlennykh Khimicheskikh Veshchestv. Toxicology of New Industrial Chemical Substances. For English translation, see TNICS*. (Izdatel'stvo Meditsina, Moscow, USSR) No.1- 1961-
Volume(issue)/page/year: 10,73,1968
TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intraperitoneal
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 137 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :
Volume(issue)/page/year: #2350222

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 75 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intravenous
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 23 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :
FRPPAO Farmaco, Edizione Pratica. (Casella Postale 227, 27100 Pavia, Italy) V.8-43 1953-88 For publisher information, see FRMCE8
Volume(issue)/page/year: 26,585,1971

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - mouse
DOSE/DURATION : 135 mg/kg

TOXIC EFFECTS :
Behavioral - convulsions or effect on seizure threshold
Lungs, Thorax, or Respiration - other changes

REFERENCE :
AIPTAK Archives Internationales de Pharmacodynamie et de Therapie. (Heymans
TYPE OF TEST            : LC50 - Lethal concentration, 50 percent kill
ROUTE OF EXPOSURE       : Inhalation
SPECIES OBSERVED        : Rodent - mouse
DOSE/DURATION           : 209 mg/m3/2H
TOXIC EFFECTS :
  Behavioral - muscle weakness
  Cardiac - pulse rate increase, without fall in BP
  Blood - leukopenia
REFERENCE :
  TPKVAL Toksikologiya Novykh Promyshlennykh Khimicheskih Veshchestv.
  Toxicology of New Industrial Chemical Substances. For English translation,
  see TNICS*. (Izdatel'stvo Meditsina, Moscow, USSR) No.1- 1961-
  Volume(issue)/page/year: 10,73,1968

TYPE OF TEST            : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE       : Intraperitoneal
SPECIES OBSERVED        : Rodent - mouse
DOSE/DURATION           : 14 mg/kg
TOXIC EFFECTS :
  Details of toxic effects not reported other than lethal dose value
REFERENCE :
  FRPSAX Farmaco, Edizione Scientifica. (Casella Postale 227, 27100 Pavia,
  Italy) V.8-43 1953-88 For publisher information, see FRMCE8
  Volume(issue)/page/year: 14,269,1959

TYPE OF TEST            : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE       : Subcutaneous
SPECIES OBSERVED        : Rodent - mouse
DOSE/DURATION           : 33 mg/kg
TOXIC EFFECTS :
  Behavioral - ataxia
  Behavioral - rigidity (including catalepsy)
REFERENCE :
  ARZNAD Arzneimittel-Forschung. Drug Research. (Editio Cantor Verlag,
  Volume(issue)/page/year: 11,932,1961

TYPE OF TEST            : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE       : Intravenous
SPECIES OBSERVED        : Rodent - mouse
DOSE/DURATION : 16 mg/kg

TOXIC EFFECTS :
- Behavioral - ataxia
- Behavioral - rigidity (including catalepsy)

REFERENCE :
Volume(issue)/page/year: 11,932,1961

TYPE OF TEST : LDLo - Lowest published lethal dose
ROUTE OF EXPOSURE : Intramuscular
SPECIES OBSERVED : Rodent - mouse
DOSE/DURATION : 300 mg/kg

TOXIC EFFECTS :
- Details of toxic effects not reported other than lethal dose value

REFERENCE :
THERAP Therapie. (Doin, Editeurs, 8, Place de l'Odeon, F-75006 Paris, France) V.1- 1946- Volume(issue)/page/year: 15,1064,1960

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Unreported
SPECIES OBSERVED : Rodent - mouse
DOSE/DURATION : 82500 ug/kg

TOXIC EFFECTS :
- Details of toxic effects not reported other than lethal dose value

REFERENCE :

TYPE OF TEST : LDLo - Lowest published lethal dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Mammal - dog
DOSE/DURATION : 250 mg/kg

TOXIC EFFECTS :
- Behavioral - altered sleep time (including change in righting reflex)
- Behavioral - rigidity (including catalepsy)
- Gastrointestinal - nausea or vomiting

REFERENCE :

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Mammal - dog
DOSE/DURATION : >20 mg/kg
TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value
REFERENCE :

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intravenous
SPECIES OBSERVED : Mammal - dog
DOSE/DURATION : 30 mg/kg
TOXIC EFFECTS :
Lungs, Thorax, or Respiration - emphysema
Lungs, Thorax, or Respiration - acute pulmonary edema
Blood - hemorrhage
REFERENCE :
AIPTAK Archives Internationales de Pharmacodynamie et de Therapie. (Heymans Institute of Pharmacology, De Pintelaan 185, B-9000 Ghent, Belgium) V.4- 1898- Volume(issue)/page/year: 118,358,1959

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Primate - monkey
DOSE/DURATION : >5 mg/kg
TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value
REFERENCE :

TYPE OF TEST : LDLo - Lowest published lethal dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Mammal - cat
DOSE/DURATION : 100 mg/kg
TOXIC EFFECTS :
Behavioral - altered sleep time (including change in righting reflex)
Behavioral - rigidity (including catalepsy)
Gastrointestinal - nausea or vomiting
REFERENCE :
TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Mammal - cat
DOSE/DURATION : >10 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intravenous
SPECIES OBSERVED : Rodent - rabbit
DOSE/DURATION : 16 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :
AIPTAK Archives Internationales de Pharmacodynamie et de Therapie. (Heymans Institute of Pharmacology, De Pintelaan 185, B-9000 Ghent, Belgium) V.4- 1898- Volume(issue)/page/year: 120,450,1959

TYPE OF TEST : LDLo - Lowest published lethal dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - guinea pig
DOSE/DURATION : 250 mg/kg

TOXIC EFFECTS :
Behavioral - altered sleep time (including change in righting reflex)
Behavioral - rigidity (including catalepsy)
Gastrointestinal - nausea or vomiting

REFERENCE :

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intraperitoneal
SPECIES OBSERVED : Rodent - guinea pig
DOSE/DURATION : 87 mg/kg

TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value

REFERENCE :
TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Mammal - species unspecified
DOSE/DURATION : 500 mg/kg

TOXIC EFFECTS:
- Behavioral - anticonvulsant
- Behavioral - alteration of classical conditioning

REFERENCE:

** OTHER MULTIPLE DOSE TOXICITY DATA **

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 210 mg/kg/15W-I

TOXIC EFFECTS:
- Brain and Coverings - other degenerative changes
- Lungs, Thorax, or Respiration - other changes
- Biochemical - Metabolism (Intermediary) - other proteins

REFERENCE:
DCTODJ Drug and Chemical Toxicology. (Marcel Dekker, 270 Madison Ave., New York, NY 10016) V.1- 1977/78- Volume(issue)/page/year: 6,135,1983

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 3040 mg/kg/22W-I

TOXIC EFFECTS:
- Cardiac - EKG changes not diagnostic of specified effects
- Cardiac - pulse rate increase, without fall in BP

REFERENCE:
Volume(issue)/page/year: 30,1709,1980

TYPE OF TEST : TDLo - Lowest published toxic dose
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<th>ROUTE OF EXPOSURE</th>
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<tr>
<td>SPECIES OBSERVED</td>
<td>Rodent - rat</td>
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<tr>
<td>DOSE/DURATION</td>
<td>1060 mg/kg/17W-I</td>
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<tr>
<td>TOXIC EFFECTS</td>
<td>Sense Organs and Special Senses (Eye) - retinal changes (pigmentary depositions, retinitis, other)</td>
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<th>TYPE OF TEST</th>
<th>TDLo - Lowest published toxic dose</th>
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<td>ROUTE OF EXPOSURE</td>
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<td>DOSE/DURATION</td>
<td>184 mg/kg/92D-I</td>
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<td>TOXIC EFFECTS</td>
<td>Cardiac - other changes</td>
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<tr>
<td></td>
<td>Liver - fatty liver degeneration</td>
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<td>Blood - changes in spleen</td>
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<tr>
<th>TYPE OF TEST</th>
<th>TDLo - Lowest published toxic dose</th>
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<td>ROUTE OF EXPOSURE</td>
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<td>TOXIC EFFECTS</td>
<td>Liver - other changes</td>
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<td></td>
<td>Kidney, Ureter, Bladder - other changes in urine composition</td>
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<td>Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other Enzymes</td>
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<tr>
<td>REFERENCE</td>
<td>TXCYAC Toxicology. (Elsevier Scientific Pub. Ireland, Ltd., POB 85, Limerick, Ireland) V.1- 1973- Volume(issue)/page/year: 75,63,1992</td>
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<tr>
<td>ROUTE OF EXPOSURE</td>
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<tr>
<td>SPECIES OBSERVED</td>
<td>Rodent - rat</td>
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<tr>
<td>DOSE/DURATION</td>
<td>250 mg/kg/5D-I</td>
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<td>TOXIC EFFECTS</td>
<td>Musculoskeletal - other changes</td>
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** TOXIC EFFECTS :**

Endocrine - changes in adrenal weight  
Related to Chronic Data - changes in testicular weight  
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - phosphatases  

** REPRODUCTIVE DATA **

** TYPE OF TEST **

TDLo - Lowest published toxic dose  

** ROUTE OF EXPOSURE **

Oral  

** SPECIES OBSERVED **

Mammal - species unspecified  

** DOSE/DURATION **

96 mg/kg/12D-I  

** TOXIC EFFECTS :**

Reproductive - Effects on Newborn - behavioral  

** REFERENCE :**


** TYPE OF TEST **

TDLo - Lowest published toxic dose  

** ROUTE OF EXPOSURE **

Oral  

** SPECIES OBSERVED **

Human - woman  

** DOSE **

173 mg/kg  

** SEX/DURATION **

female 26-39 week(s) after conception  

** TOXIC EFFECTS :**

Reproductive - Effects on Newborn - other neonatal measures or effects  
Reproductive - Effects on Newborn - physical  

** REFERENCE :**


** TYPE OF TEST **

TDLo - Lowest published toxic dose  

** ROUTE OF EXPOSURE **

Unreported  

** SPECIES OBSERVED **

Human - woman  

** DOSE **

540 mg/kg  

** SEX/DURATION **

female 1-39 week(s) after conception  

** TOXIC EFFECTS :**

Reproductive - Effects on Newborn - other neonatal measures or effects  
Reproductive - Effects on Newborn - physical  

** REFERENCE :**

AGPSA3 AMA Archives of General Psychiatry. (Chicago, IL) V.1-2, 1959-60.
TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Unreported
SPECIES OBSERVED : Human - woman
DOSE : 242 mg/kg
SEX/DURATION : female 1-17 week(s) after conception

TOXIC EFFECTS :
  Reproductive - Fertility - abortion

REFERENCE :
AGPSA3 AMA Archives of General Psychiatry. (Chicago, IL) V.1-2, 1959-60.

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE : 30 mg/kg
SEX/DURATION : female 6-15 day(s) after conception

TOXIC EFFECTS :
  Reproductive - Effects on Newborn - growth statistics (e.g.% reduced weight gain)
  Reproductive - Effects on Newborn - behavioral

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE : 119 mg/kg
SEX/DURATION : female 13 day(s) after conception

TOXIC EFFECTS :
Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus)

Reproductive - Effects on Embryo or Fetus - fetal death

REFERENCE:
PJPPAA Polish Journal of Pharmacology and Pharmacy. (ARS Polona, POB 1001, 00-068 Warsaw 1, Poland) V.25- 1973- Volume(issue)/page/year:
32,199,1980

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE : 10 mg/kg
SEX/DURATION : female 15 day(s) after conception

TOXIC EFFECTS:
Reproductive - Effects on Newborn - behavioral

REFERENCE:
FEPRA7 Federation Proceedings, Federation of American Societies for Experimental Biology. (Bethesda, MD) V.1-46, 1942-87.
Volume(issue)/page/year: 28,743,1969

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE : 4 mg/kg
SEX/DURATION : female 1 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Fertility - other measures of fertility

REFERENCE:
DCTODJ Drug and Chemical Toxicology. (Marcel Dekker, 270 Madison Ave., New York, NY 10016) V.1- 1977/78- Volume(issue)/page/year: 7,41,1984

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Intraperitoneal
SPECIES OBSERVED : Rodent - rat
DOSE : 1 mg/kg
SEX/DURATION : male 1 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Fertility - mating performance (e.g. # sperm positive females per # females mated; # copulations per # estrus cycles)

REFERENCE:
SCIEAS Science. (American Assoc. for the Advancement of Science, 1333 H St., NW, Washington, DC 20005) V.1- 1895- Volume(issue)/page/year:
127,84,1958
TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Intraperitoneal
SPECIES OBSERVED : Rodent - rat
DOSE : 2500 ug/kg
SEX/DURATION : female 1 day(s) pre-mating

TOXIC EFFECTS :
Reproductive - Fertility - other measures of fertility

REFERENCE :
ACEDAB Acta Endocrinologica, Supplementum (Copenhagen). (Periodica, Skolegade 12 E, DK-2500 Valby, Denmark) No.1- 1948-
Volume(issue)/page/year: 105,7,1966

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 50 mg/kg
SEX/DURATION : female 1 day(s) pre-mating

TOXIC EFFECTS :
Reproductive - Maternal Effects - menstrual cycle changes or disorders

REFERENCE :
ENDOAO Endocrinology (Baltimore). (Williams & Wilkins Co., 428 E. Preston St., Baltimore, MD 21203) V.1- 1917- Volume(issue)/page/year: 65,563,1959

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 24 mg/kg
SEX/DURATION : female 11-14 day(s) after conception

TOXIC EFFECTS :
Reproductive - Effects on Newborn - behavioral

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 24 mg/kg
SEX/DURATION : female 17-20 day(s) after conception

TOXIC EFFECTS :
Reproductive - Effects on Newborn - growth statistics (e.g.% reduced weight gain)
REFERENCE:
NATUAS Nature. (Nature Subscription Dept., POB 1018, Manasquan, NJ 08736)
V.1- 1869- Volume(issue)/page/year: 215,182,1967

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 24 mg/kg
SEX/DURATION : female 4-7 day(s) after conception

TOXIC EFFECTS:
Reproductive - Effects on Newborn - stillbirth
Reproductive - Effects on Newborn - viability index (e.g., # alive at day 4 per # born alive)
Reproductive - Effects on Newborn - weaning or lactation index (e.g., # alive at weaning per # alive at day 4)

REFERENCE:

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 60 mg/kg
SEX/DURATION : male 5 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Fertility - mating performance (e.g. # sperm positive females per # females mated; # copulations per # estrus cycles)

REFERENCE:
ANENAG Annales d'Endocrinologie. (Masson Editeur, 120 Blvd. Saint-Germain, F-25280 Paris Cedex 06, France) V.1- 1939- Volume(issue)/page/year: 24(Suppl 3),1,1963

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rat
DOSE : 225 mg/kg
SEX/DURATION : female 15 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Maternal Effects - breasts, lactation (prior to or during pregnancy)

REFERENCE:
AJPHAP American Journal of Physiology. (American Physiological Soc., 9650 Rockville Pike, Bethesda, MD 20814) V.1- 1898- Volume(issue)/page/year:
TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Subcutaneous
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 10 mg/kg
SEX/DURATION            : female 1 day(s) pre-mating

TOXIC EFFECTS :
Reproductive - Fertility - other measures of fertility

REFERENCE :
ENDOAO Endocrinology (Baltimore). (Williams & Wilkins Co., 428 E. Preston
St., Baltimore, MD 21203) V.1- 1917- Volume(issue)/page/year: 74,309,1964

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Intramuscular
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 20 mg/kg
SEX/DURATION            : female 5 day(s) after conception

TOXIC EFFECTS :
Reproductive - Fertility - pre-implantation mortality (e.g. reduction in
number of implants per female; total number of implants per corpora lutea)
Reproductive - Effects on Newborn - stillbirth

REFERENCE :
(Academic Press, Inc., 1 E. First St., Duluth, MN 55802) V.1- 1903/04-
Volume(issue)/page/year: 100,555,1959

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Intramuscular
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 270 mg/kg
SEX/DURATION            : female 18-22 day(s) after conception
lactating female 13 day(s) post-birth

TOXIC EFFECTS :
Reproductive - Effects on Embryo or Fetus - cytological changes (including
somatic cell genetic material)
Reproductive - Specific Developmental Abnormalities - Central Nervous System

REFERENCE :
TJADAB Teratology, The International Journal of Abnormal Development. (Alan
R. Liss, Inc., 41 E. 11th St., New York, NY 10003) V.1- 1968-
Volume(issue)/page/year: 26,21,1982

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Intramuscular
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 220 mg/kg
SEX/DURATION            : female 1-22 day(s) after conception

TOXIC EFFECTS :
  Reproductive - Effects on Newborn - behavioral

REFERENCE :

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Intramuscular
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 28 mg/kg
SEX/DURATION            : male 7 day(s) pre-mating

TOXIC EFFECTS :
  Reproductive - Paternal Effects - testes, epididymis, sperm duct

REFERENCE :

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Unreported
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 245 mg/kg
SEX/DURATION            : female 8-22 day(s) after conception
                        lactating female 21 day(s) post-birth

TOXIC EFFECTS :
  Reproductive - Effects on Newborn - other postnatal measures or effects

REFERENCE :
  PHMCAA Pharmacologist. (American Soc. for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, MD 20014) V.1-1959- Volume(issue)/page/year: 18,231,1976

TYPE OF TEST            : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE       : Unreported
SPECIES OBSERVED        : Rodent - rat
DOSE                    : 300 mg/kg
SEX/DURATION            : female 9-14 day(s) after conception

TOXIC EFFECTS :
  Reproductive - Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)
Reproductive - Effects on Embryo or Fetus - fetal death

REFERENCE:
FATOAO Farmakologiya i Toksikologiya (Moscow). For English translation, see
PHTXA6 and RPTOAN. (V/O Mezhdunarodnaya Kniga, 113095 Moscow, USSR) V.2-
1939- Volume(issue)/page/year: 45(1),83,1982

TYPE OF TEST          : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE     : Oral
SPECIES OBSERVED      : Rodent - mouse
DOSE                  : 336 mg/kg
SEX/DURATION          : female 1-21 day(s) after conception

TOXIC EFFECTS:
Reproductive - Effects on Newborn - biochemical and metabolic
Reproductive - Effects on Newborn - other postnatal measures or effects

REFERENCE:
ANREAK Anatomical Record. (Alan R. Liss, Inc., 41 E. 11th St., New York, NY
10003) V.1- 1906/08- Volume(issue)/page/year: 157,311,1967

TYPE OF TEST          : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE     : Oral
SPECIES OBSERVED      : Rodent - mouse
DOSE                  : 448 mg/kg
SEX/DURATION          : female 1-28 day(s) after conception

TOXIC EFFECTS:
Reproductive - Maternal Effects - parturition
Reproductive - Fertility - litter size (e.g. # fetuses per litter; measured
before birth)

REFERENCE:
(Academic Press, Inc., 1 E. First St., Duluth, MN 55802) V.1- 1903/04-
Volume(issue)/page/year: 113,833,1963

TYPE OF TEST          : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE     : Oral
SPECIES OBSERVED      : Rodent - mouse
DOSE                  : 50 mg/kg
SEX/DURATION          : female 10 day(s) after conception

TOXIC EFFECTS:
Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death,
e.g., stunted fetus)
Reproductive - Effects on Embryo or Fetus - fetal death
Reproductive - Specific Developmental Abnormalities - craniofacial
(including nose and tongue)

REFERENCE:
TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - mouse
DOSE : 50 mg/kg
SEX/DURATION : female 8 day(s) after conception

TOXIC EFFECTS :
Reproductive - Specific Developmental Abnormalities - Central Nervous System
Reproductive - Specific Developmental Abnormalities - eye/ear

REFERENCE :
TOIZAG Toho Igakkai Zasshi. Journal of Medical Society of Toho University.
(Toho Daigaku Igakkai, 21-16, Omori-nishi, 5-chome, Ota-ku, Tokyo 143,

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - mouse
DOSE : 160 mg/kg
SEX/DURATION : female 3-6 day(s) after conception

TOXIC EFFECTS :
Reproductive - Fertility - other measures of fertility

REFERENCE :
JOENAK Journal of Endocrinology. (Biochemical Soc. Book Depot, POB 32,
Commerce Way, Colchester, Essex CO2 8HP, UK) V.1- 1939-
Volume(issue)/page/year: 43,225,1969

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Intramuscular
SPECIES OBSERVED : Rodent - mouse
DOSE : 176 mg/kg
SEX/DURATION : female 10 day(s) pre-mating
female 18 day(s) after conception

TOXIC EFFECTS :
Reproductive - Specific Developmental Abnormalities - musculoskeletal system
Reproductive - Specific Developmental Abnormalities - cardiovascular (circulatory) system
Reproductive - Effects on Newborn - growth statistics (e.g.% reduced weight gain)

REFERENCE :
FATOAO Farmakologiya i Tokskologiya (Moscow). For English translation, see
TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Intramuscular
SPECIES OBSERVED : Rodent - mouse
DOSE : 160 mg/kg
SEX/DURATION : female 10 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Maternal Effects - oogenesis

REFERENCE:
FATOAO Farmakologiya i Toksikologiya (Moscow). For English translation, see
PHTXA6 and RPTOAN. (V/O Mezhdunarodnaya Kniga, 113095 Moscow, USSR) V.2-
1939- Volume(issue)/page/year: 38,473,1975

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TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Parenteral
SPECIES OBSERVED : Rodent - mouse
DOSE : 19800 ug/kg
SEX/DURATION : female 6-16 day(s) after conception

TOXIC EFFECTS:
Reproductive - Fertility - post-implantation mortality (e.g. dead and/or
resorbed implants per total number of implants)
Reproductive - Effects on Embryo or Fetus - fetal death
Reproductive - Specific Developmental Abnormalities - musculoskeletal system

REFERENCE:
CMJODS Chinese Medical Journal (Beijing, English Edition). (China
International Book Trading Corp., P.O.B 2820, Beijing, Peop. Rep. China) V.1-
1975- Adopted vol. no. 92 in 1979. Volume(issue)/page/year:
101,339,1988

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TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Unreported
SPECIES OBSERVED : Rodent - mouse
DOSE : 120 mg/kg
SEX/DURATION : female 1 day(s) pre-mating

TOXIC EFFECTS:
Reproductive - Fertility - other measures of fertility

REFERENCE:
AJOGAH American Journal of Obstetrics and Gynecology. (C.V. Mosby Co.,
11830 Westline Industrial Dr., St. Louis, MO 63146) V.1-
1920- Volume(issue)/page/year: 83,1405,1962

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ROUTE OF EXPOSURE : Unreported
SPECIES OBSERVED : Rodent - mouse
DOSE : 400 ug/kg
SEX/DURATION : female 1 day(s) pre-mating

TOXIC EFFECTS :
Reproductive - Fertility - other measures of fertility

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Subcutaneous
SPECIES OBSERVED : Rodent - rabbit
DOSE : 40 mg/kg
SEX/DURATION : female 27-30 day(s) after conception

TOXIC EFFECTS :
Reproductive - Effects on Newborn - weaning or lactation index (e.g., # alive at weaning per # alive at day 4)
Reproductive - Effects on Newborn - biochemical and metabolic

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Unreported
SPECIES OBSERVED : Rodent - rabbit
DOSE : 30 mg/kg
SEX/DURATION : female 16-30 day(s) after conception

TOXIC EFFECTS :
Reproductive - Effects on Newborn - stillbirth

REFERENCE :

TYPE OF TEST : TDLo - Lowest published toxic dose
ROUTE OF EXPOSURE : Intramuscular
SPECIES OBSERVED : Mammal - domestic
DOSE : 12 mg/kg
SEX/DURATION : male 8 day(s) pre-mating

TOXIC EFFECTS :
Reproductive - Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

REFERENCE :
** MUTATION DATA **

TYPE OF TEST : DNA adduct
TEST SYSTEM : Bacteria - Escherichia coli
DOSE/DURATION : 3 umol/L


TYPE OF TEST : Mutation in microorganisms
TEST SYSTEM : Yeast - Saccharomyces cerevisiae
DOSE/DURATION : 1 mg/L


TYPE OF TEST : Gene conversion and mitotic recombination
TEST SYSTEM : Yeast - Saccharomyces cerevisiae
DOSE/DURATION : 1 mg/L


TYPE OF TEST : Mutation test systems - not otherwise specified
TEST SYSTEM : Human Fibroblast
DOSE/DURATION : 8 umol/L

REFERENCE : DNSYAG Diseases of the Nervous System. (Memphis, TN) V.1-38, 1940-77. For publisher information, see JCLPDE. Volume(issue)/page/year: 29,829,1968

TYPE OF TEST : Cytogenetic analysis
TEST SYSTEM : Human Lymphocyte
DOSE/DURATION : 250 ug/L


TYPE OF TEST : Cytogenetic analysis
TEST SYSTEM : Human Leukocyte
DOSE/DURATION : 100 mg/L
REFERENCE :

TYPE OF TEST : Cytogenetic analysis
TEST SYSTEM : Human Embryo
DOSE/DURATION : 1 mg/L
REFERENCE :

TYPE OF TEST : Cytogenetic analysis
TEST SYSTEM : Human Fibroblast
DOSE/DURATION : 8 umol/L
REFERENCE :
DNSYAG Diseases of the Nervous System. (Memphis, TN) V.1-38, 1940-77. For publisher information, see JCLPDE. Volume(issue)/page/year: 29,829,1968

TYPE OF TEST : Sister chromatid exchange
TEST SYSTEM : Human Lymphocyte
DOSE/DURATION : 250 ug/L
REFERENCE :

TYPE OF TEST : Mutation test systems - not otherwise specified
TEST SYSTEM : Rodent - mouse Ascites tumor
DOSE/DURATION : 250 umol/L
REFERENCE :

TYPE OF TEST : Host-mediated assay
TEST SYSTEM : Rodent - mouse Ascites tumor
DOSE/DURATION : 200 ug/kg
REFERENCE :
MUREAW Mutation Research. (Elsevier Science Pub. B.V., POB 211, 1000 AE
TYPE OF TEST: Sperm Morphology
ROUTE OF EXPOSURE: Parenteral
TEST SYSTEM: Rodent - mouse
DOSE/DURATION: 20 mg/kg

REFERENCE:

*** REVIEWS ***

TOXICOLOGY REVIEW

TOXICOLOGY REVIEW
ADVPA3 Advances in Pharmacology. (New York, NY) V.1-6, 1962-68. For publisher information, see AVPCAO. Volume(issue)/page/year: 4,263,1966

TOXICOLOGY REVIEW
FNSCA6 Forensic Science. (Lausanne, Switzerland) V.1-11, 1972-78. For publisher information, see FSINDR. Volume(issue)/page/year: 2,67,1973

*** OCCUPATIONAL EXPOSURE LIMITS ***

OEL-RUSSIA: STEL 0.3 mg/m3; Skin JAN 1993

*** NIOSH STANDARDS DEVELOPMENT AND SURVEILLANCE DATA ***

NIOSH OCCUPATIONAL EXPOSURE SURVEY DATA:
NOES Hazard Code - X4292
No. of Facilities: 60 (estimated)
No. of Industries: 1
No. of Occupations: 5
No. of Employees: 1403 (estimated)
No. of Female Employees: 780 (estimated)

*** STATUS IN U.S. ***

EPA GENETOX PROGRAM 1988, Positive/dose response: In vitro SCE-nonhuman