

## MATERIAL SAFETY DATA SHEET

Date Printed: 04/19/2006

Date Updated: 01/30/2006

Version 1.3

## Section 1 - Product and Company Information

Product Name (-)-EPINEPHRINE  
Product Number E4250  
Brand SIGMA

Company Sigma-Aldrich  
Address 3050 Spruce Street  
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832  
Fax: 800-325-5052  
Emergency Phone: 314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313 No
(-)-EPINEPHRINE	51-43-4	

Formula C9H13NO3  
Synonyms Adrenaline \* Adrenal \* Adrenalin \* l-Adrenalin \* (-)-Adrenaline \* l-Adrenaline \* Adrenamine \* Adrenan \* Adrenapax \* Adrenasol \* Adrenine \* Adrenodis \* Adrenohorma \* Adrenosan \* Adrenutol \* Adrin \* Balmadren \* 1,2-Benzenediol, 4-(1-hydroxy-2-(methylamino)ethyl)-, (R)- (9CI) \* Bernarenin \* Biorenine \* Bosmin \* Brevirenin \* Bronkaid mist \* Chelafrin \* Corisol \* 3,4-Dihydroxy-alpha-((methylamino)methyl)benzyl alcohol \* 1-1-(3,4-Dihydroxyphenyl)-2-methylaminoethanol \* Drenamist \* Dylephrin \* Dyspne-inhal \* Epifrin \* Epinefrin (Czech) \* Epinefrina \* Epinephran \* (-)-Epinephrine \* l-Epinephrine \* (R)-Epinephrine \* l-Epinephrine (synthetic) \* l-Epirenamine \* Epirenan \* Epitrate \* Exadrin \* Glaucosan \* Glycirenin \* Haemostasin \* Haemostatin \* Hektalin \* Hemisine \* Hemostasin \* Hemostatin \* Hypernephrenin \* Hyporenin \* Intranephrenin \* Kidoline \* Levorenin \* Levorenine \* Lyophrenin \* Metanephrenin \* Methylarterenol \* Mucidrina \* Myosthenine \* Mytrate \* Nephridine \* Nieraline \* Paranephrenin \* RCRA waste number P042 \* Renaglandin \* Renaleptine \* Renalina \* Renoform \* Renostypticin

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Highly Toxic (USA) Toxic (EU).

May cause harm to the unborn child. Toxic by inhalation, in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.

Target organ(s): Heart. Smooth muscle.

HMIS RATING  
HEALTH: 3\*  
FLAMMABILITY: 0  
REACTIVITY: 0

NFPA RATING  
HEALTH: 3  
FLAMMABILITY: 0  
REACTIVITY: 0

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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#### Section 4 - First Aid Measures

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##### 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.

##### EYE EXPOSURE

Assure adequate flushing of the eyes by separating the eyelids with fingers.

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#### Section 5 - Fire Fighting Measures

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##### 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.

##### EXPOSURE HAZARD(S)

Material: Irritant.

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#### Section 6 - Accidental Release Measures

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##### 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.

##### 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.

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## Section 7 - Handling and Storage

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### HANDLING

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

### STORAGE

Suitable: Keep tightly closed. Store in a cool dry place.  
Store at 2-8°C

### SPECIAL REQUIREMENTS

Light sensitive.

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## Section 8 - Exposure Controls / PPE

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### ENGINEERING CONTROLS

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

### PERSONAL PROTECTIVE EQUIPMENT

Other: Wear appropriate government approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

### GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

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## Section 9 - Physical/Chemical Properties

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Appearance

Color: Faintly beige  
Form: Fine crystals

Property

Value

At Temperature or Pressure

Molecular Weight

183.21 AMU

pH

N/A

BP/BP Range

N/A

MP/MP Range

215 °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: 50 g/l Solvent: 5% HCl  
   -61.5 - -52 (+/-2)

Miscellaneous Data                      N/A  
Solubility                                N/A

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Conditions of Instability: May decompose on exposure to light.  
Materials to Avoid: Acids, Acid chlorides, Acid anhydrides,  
Oxidizing agents.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide,  
Nitrogen oxides.

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Inhalation: Material is irritating to mucous membranes and upper  
respiratory tract.

Multiple Routes: May be fatal if inhaled, swallowed, or absorbed  
through skin. Causes eye and skin irritation.

### TARGET ORGAN(S) OR SYSTEM(S)

Smooth muscle. Heart.

### SIGNS AND SYMPTOMS OF EXPOSURE

Laboratory experiments in animals have shown fetotoxic results.

### TOXICITY DATA

#### Subcutaneous

Man

7 UG/KG

LDLO

Remarks: Brain and Coverings:Other degenerative changes.  
Cardiac:Other changes.

#### Skin

Rat

62 mg/kg

LD50

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

#### Subcutaneous

Rat

5 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Respiratory stimulation.

#### Intravenous

Rat

150 UG/KG

LD50

#### Intramuscular

Rat  
3500 MG/KG  
LD50

Intraperitoneal  
Mouse  
4 MG/KG  
LD50

Subcutaneous  
Mouse  
1470 UG/KG  
LD50

Intravenous  
Mouse  
217 UG/KG  
LD50

Remarks: Skin and Appendages: Other: Hair. Behavioral: Change in motor activity (specific assay). Cardiac: Pulse rate increased without fall in BP.

Subcutaneous  
Dog  
5 MG/KG  
LD50

Intravenous  
Dog  
100 UG/KG  
LD50

Subcutaneous  
Rabbit  
4 MG/KG  
LD50

Remarks: Lungs, Thorax, or Respiration: Respiratory stimulation.

Intravenous  
Rabbit  
50 UG/KG  
LD50

Remarks: Lungs, Thorax, or Respiration: Respiratory stimulation.

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 1 MG/KG  
Route of Application: Intraperitoneal  
Exposure Time: (13D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Embryo or Fetus: Fetal death.

Species: Rat  
Dose: 10 UG/KG  
Route of Application: Intravenous  
Exposure Time: (20D PREG)  
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rat  
Dose: 1 MG/KG

Route of Application: Intramuscular  
Exposure Time: (10D PREG)  
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Hamster  
Dose: 2 MG/KG  
Route of Application: Subcutaneous  
Exposure Time: (7-10D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

#### CHRONIC EXPOSURE - MUTAGEN

Species: Rat  
Dose: 2500 NMOL/L  
Cell Type: lung  
Mutation test: DNA damage

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

Species: Mouse  
Dose: 2500 NG/L  
Cell Type: Other cell types  
Mutation test: Other mutation test systems

Species: Mouse  
Dose: 100 MG/L  
Cell Type: lymphocyte  
Mutation test: Mutation in mammalian somatic cells.

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 50 UG/KG  
Route of Application: Intraperitoneal  
Exposure Time: (1D MALE)  
Result: Effects on Fertility: Mating performance (e.g., # sperm positive females per # females mated; # copulations per # estrus cycles).

Species: Rat  
Dose: 6 MG/KG  
Route of Application: Intraperitoneal  
Exposure Time: (7-14D PREG)  
Result: Effects on Newborn: Behavioral.

Species: Rat  
Dose: 2400 UG/KG  
Route of Application: Subcutaneous  
Exposure Time: (1-6D PREG)  
Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.

Species: Rat  
Dose: 5 MG/KG

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

Species: Rat  
Dose: 2 MG/KG  
Route of Application: Intramuscular  
Exposure Time: (10D PREG)  
Result: Maternal Effects: Other effects. Nutritional and Gross Metabolic: Weight loss or decreased weight gain.

Species: Rat  
Dose: 5760 UG/KG  
Route of Application: Implant  
Exposure Time: (14-21D PREG)  
Result: Effects on Newborn: Germ cell effects (in offspring).

Species: Mouse  
Dose: 16 MG/KG  
Route of Application: Subcutaneous  
Exposure Time: (7-10D PREG)  
Result: Effects on Fertility: Other measures of fertility

Species: Rabbit  
Dose: 2400 UG/KG  
Route of Application: Subcutaneous  
Exposure Time: (6-7D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). 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: 5500 UG/KG  
Route of Application: Subcutaneous  
Exposure Time: (3D PRE)  
Result: Effects on Fertility: Other measures of fertility

Species: Rabbit  
Dose: 15 MG/KG  
Route of Application: Subcutaneous  
Exposure Time: (15D MALE)  
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rabbit  
Dose: 7500 UG/KG  
Route of Application: Subcutaneous  
Exposure Time: (15D MALE)  
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rabbit  
Dose: 90 UG/KG  
Route of Application: Intravaginal  
Exposure Time: (1D PRE)  
Result: Effects on Fertility: Other measures of fertility

Species: Hamster  
Dose: 2 MG/KG  
Route of Application: Subcutaneous

Exposure Time: (7-10D PREG)  
Result: Effects on Fertility: Other measures of fertility

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## Section 12 - Ecological Information

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No data available.

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

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.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: Toxic solids, organic, n.o.s.  
UN#: 2811  
Class: 6.1  
Packing Group: Packing Group II  
Hazard Label: Toxic substances.  
PIH: Not PIH

### IATA

Proper Shipping Name: Toxic solid, organic, n.o.s.  
IATA UN Number: 2811  
Hazard Class: 6.1  
Packing Group: II

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## Section 15 - Regulatory Information

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### EU ADDITIONAL CLASSIFICATION

Symbol of Danger: T  
Indication of Danger: Toxic.  
R: 23/24/25  
Risk Statements: Toxic by inhalation, in contact with skin and if swallowed.  
S: 36/37/39-45  
Safety Statements: Wear suitable protective clothing, gloves, and eye/face protection. 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: Highly Toxic (USA) Toxic (EU).  
Risk Statements: May cause harm to the unborn child. Toxic by inhalation, in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.  
Safety Statements: Avoid exposure - obtain special instructions before use. Do not breathe dust. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
US Statements: Target organ(s): Heart. Smooth muscle.

### 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

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## Section 16 - Other Information

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