Section 1 - Product and Company Information

Product Name                       BENZENE, 99%, A.C.S. REAGENT
Product Number                     319953
Brand                              ALDRICH

Company                            Sigma-Aldrich
Street Address                     3050 Spruce Street
City, State, Zip, Country          SAINT LOUIS MO 63103 US
Technical Phone:                   314 771 5765
Emergency Phone:                   414 273 3850 Ext. 5996
Fax:                               800 325 5052

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 313</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENZENE</td>
<td>71-43-2</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Formula         C6H6
Synonyms       (6)Annulene * Benzeen (Dutch) * Benzen (Polish) *
                Benzene (ACGIH:OSHA) * Benzin (Obs.) * Benzine (Obs.) * Benzol (OSHA) * Benzole * Benzolene *
                Benzolo (Italian) * Bicarburet of hydrogen * Carbon oil * Coal naphtha * Cyclohexatriene *
                Fenzen (Czech) * Mineral naphtha * NCI-C55276 *
                Phene * Phenyl hydride * Pyrobenzol * Pyrobenzole *
                * RCRA waste number U019
RTECS Number:   CY1400000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Flammable (USA) Highly Flammable (EU). Toxic.
May cause cancer. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes.

HMIS RATING
HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 0

NFPA RATING
HEALTH: 2
FLAMMABILITY: 3
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

FLAMMABLE HAZARDS
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
12 °F  -11 °C  Method: closed cup

EXPLOSION LIMITS
Lower: 1.3 %  Upper: 8 %

AUTOIGNITION TEMP
562 °C

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): Flammable liquid. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.

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 self-contained breathing apparatus, 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: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

Section 8 - Exposure Controls / PPE

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

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.

EXPOSURE LIMITS, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.5 PPM3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>2.5 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard</td>
<td>Ceiling co25 PPM (80 MG/M3) (SKIN)</td>
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</tr>
<tr>
<td>New Zealand</td>
<td>OEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remarks:  check ACGIH TLV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>NIOSH</td>
<td>TWA</td>
<td>0.1 PPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling co1 PPM/15M</td>
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EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
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<th>Value</th>
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<tr>
<td>Poland</td>
<td>NDS</td>
<td>10 MG/M3</td>
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<tr>
<td>Poland</td>
<td>NDSCh</td>
<td>40 MG/M3</td>
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<tr>
<td>Poland</td>
<td>NDSP</td>
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Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Liquid</td>
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<td></td>
<td>Color: Colorless</td>
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<tr>
<td>Property</td>
<td>Value</td>
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<tr>
<td>Molecular Weight</td>
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<td>MP/MP Range</td>
<td>5.5 °C</td>
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<tr>
<td>Freezing Point</td>
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<tr>
<td>Vapor Pressure</td>
<td>74.6 mmHg, 20 °C</td>
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<td>Vapor Density</td>
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<td>Saturated Vapor Conc.</td>
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<td>Property</td>
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<tr>
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<td>SG/Density</td>
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<td>VOC Content</td>
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<td>Water Content</td>
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<td>Solvent Content</td>
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<td>Decomposition Temp.</td>
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<td>Flash Point</td>
<td>12 °F - 11 °C Method: closed cup</td>
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<tr>
<td>Explosion Limits</td>
<td>Lower: 1.3 %</td>
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</tr>
<tr>
<td></td>
<td>Upper: 8 %</td>
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<td>Flammability</td>
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<td>Autoignition Temp</td>
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<tr>
<td>Solubility</td>
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</tr>
</tbody>
</table>

N/A = not available

Section 10 - Stability and Reactivity

**STABILITY**
- Stable.
- Materials to Avoid: Acids, Bases, Halogens, Strong oxidizing agents, Avoid contact with metal salts.

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

**HAZARDOUS POLYMERIZATION**
- Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

**cancer hazard**

**ROUTE OF EXPOSURE**
- Skin Contact: Causes skin irritation.
- Skin Absorption: Toxic if absorbed through skin.
- Eye Contact: Causes severe eye irritation.
- Inhalation: Toxic if inhaled. Vapor or mist is irritating to the mucous membranes and upper respiratory tract.
- Ingestion: Toxic if swallowed.

**TARGET ORGAN(S) OR SYSTEM(S)**

**SIGNS AND SYMPTOMS OF EXPOSURE**
- Exposure can cause: Nausea, dizziness, and headache. Narcotic effect. Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation and/or giddiness, depression, drowsiness, or fatigue. The victim may experience tightness in the chest, breathlessness, and loss of consciousness. Tremors, convulsions, and death due to respiratory paralysis or circulatory collapse can occur in a few minutes to several hours following severe exposures. Aspiration
of small amounts of liquid immediately causes pulmonary edema and hemorrhage of pulmonary tissue. Direct skin contact may cause erythema. Repeated or prolonged skin contact may result in drying, scaling dermatitis, or development of secondary skin infections. The chief target organ is the hematopoietic system. Bleeding from the nose, gums, or mucous membranes and the development of purpuric spots, pancytopenia, leukopenia, thrombocytopenia, aplas

TOXICITY DATA

Inhalation
Human
2 PPH/5M
LCLO

Oral
Man
50 mg/kg
LDLO

Inhalation
Human
65 mg/m3
LCLO
Remarks: Blood:Other changes.

Oral
Rat
930 mg/kg
LD50

Inhalation
Rat
10,000 ppm
LC50

Intraperitoneal
Rat
1100 UG/KG
LD50

Oral
Mouse
4700 mg/kg
LD50

Inhalation
Mouse
9,980 ppm
LC50

Skin
Mouse
48 mg/kg
LD50

Intraperitoneal
Mouse
340 MG/KG
LD50

Skin
Rabbit
>9400 UL/KG
LD50

Skin
Guinea pig
>9400 UL/KG
LD50

Oral
Mammal
5700 mg/kg
LD50

IRRITATION DATA

Skin
Rabbit
15 mg
24H
Remarks: Open irritation test

Skin
Rabbit
20 mg
24H
Remarks: Moderate irritation effect

Eyes
Rabbit
88 mg
Remarks: Moderate irritation effect

Eyes
Rabbit
2 mg
24H
Remarks: Severe irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Man
Route of Application: Inhalation
Dose: 200 MG/M3
Exposure Time: 78W-
Frequency: I
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Blood:Leukemia Blood:Thrombocytopenia.

Species: Human
Route of Application: Inhalation
Dose: 10 PPM
Exposure Time: 8H/10Y
Frequency: I
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Blood:Leukemia

Species: Rat
Route of Application: Oral
Dose: 52 GM/KG
Exposure Time: 52W
Frequency: I
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Endocrine:Tumors. Blood:Leukemia

Species: Rat
Route of Application: Inhalation
Dose: 1200 PPM
Exposure Time: 6H/10W
Frequency: I

Species: Mouse
Route of Application: Oral
Dose: 18250 MG/KG
Exposure Time: 2Y
Frequency: C

Species: Mouse
Route of Application: Inhalation
Dose: 300 PPM
Exposure Time: 6H/16W
Frequency: I

Species: Mouse
Route of Application: Skin
Dose: 1200 GM/KG
Exposure Time: 49W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Intraperitoneal
Dose: 1200 MG/KG
Exposure Time: 8W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors.

Species: Mouse
Route of Application: Subcutaneous
Dose: 600 MG/KG
Exposure Time: 17W
Frequency: I

Species: Mouse
Route of Application: Parenteral  
Dose: 670 MG/KG  
Exposure Time: 19W  
Frequency: I  

Species: Human  
Route of Application: Inhalation  
Dose: 150 PPM  
Exposure Time: 15M/8Y  
Frequency: I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Blood:Leukemia

Species: Rat  
Route of Application: Oral  
Dose: 52 GM/KG  
Exposure Time: 1Y  
Frequency: I  

Species: Rat  
Route of Application: Oral  
Dose: 10 GM/KG  
Exposure Time: 52W  
Frequency: I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Endocrine:Tumors. Blood:Leukemia

Species: Man  
Route of Application: Inhalation  
Dose: 600 MG/M3  
Exposure Time: 4Y-  
Frequency: I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Blood:Leukemia

Species: Man  
Route of Application: Inhalation  
Dose: 150 PPM  
Exposure Time: 11Y  
Frequency: I  

Species: Mouse  
Route of Application: Inhalation  
Dose: 1200 PPM  
Exposure Time: 6H/10W  
Frequency: I  

Species: Mouse  
Route of Application: Oral  
Dose: 2400 MG/KG  
Exposure Time: 8W
Frequency: I
Result: Tumorigenic: Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors.

Species: Human
Route of Application: Inhalation
Dose: 8 PPB
Exposure Time: 4W
Frequency: I
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Blood: Leukemia

Species: Human
Route of Application: Inhalation
Dose: 10 MG/M3
Exposure Time: 11Y-
Frequency: I
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Blood: Leukemia

Species: Mouse
Route of Application: Inhalation
Dose: 300 PPM
Exposure Time: 6H/16W
Frequency: I
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Blood: Leukemia

OSHA CARCINOGEN LIST

cancer hazard

IARC CARCINOGEN LIST

Rating: Group 1

NTP CARCINOGEN LIST

Rating: Clear evidence.
Species: Mouse/rat
Route: Gavage

ACGIH CARCINOGEN LIST

Rating: A1

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 50 PPM/24H
Route of Application: Inhalation
Exposure Time: (7-14D PREG)
Result: 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).

Species: Mouse
Dose: 9 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Species: Mouse
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 500 MG/M3/12H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 5 PPM
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Species: Mouse
Dose: 20 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Species: Mouse
Dose: 219 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (14D PREG)

Species: Mouse
Dose: 1100 MG/KG
Route of Application: Subcutaneous
Exposure Time: (12D PREG)
Result: Effects on Embryo or Fetus: Other effects to embryo.

Species: Mouse
Dose: 7030 MG/KG
Route of Application: Subcutaneous
Exposure Time: (12-13D PREG)
Result: 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). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 13200 UG/KG
Route of Application: Intravenous
Exposure Time: (13-16D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).
Species: Rabbit
Dose: 1 GM/M3/24H
Route of Application: Inhalation
Exposure Time: (7-20D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Other developmental abnormalities.

CHRONIC EXPOSURE - MUTAGEN
Result: Laboratory experiments have shown mutagenic effects.

Species: Human
Dose: 2200 UMOL/L
Cell Type: leukocyte
Mutation test: DNA inhibition

Species: Human
Dose: 2200 UMOL/L
Cell Type: HeLa cell
Mutation test: DNA inhibition

Species: Human
Dose: 5 UMOL/L
Cell Type: lymphocyte
Mutation test: Other mutation test systems

Species: Human
Route: Inhalation
Dose: 125 PPM
Exposure Time: 1Y
Mutation test: Cytogenetic analysis

Species: Human
Dose: 1 MMOL/L
Exposure Time: 72H
Cell Type: leukocyte
Mutation test: Cytogenetic analysis

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

Species: Human
Route: Unreported
Dose: 10 PPM
Exposure Time: 4W
Mutation test: Cytogenetic analysis

Species: Human
Dose: 200 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Human
Dose: 1 GM/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Rat
Route: Inhalation
Dose: 1 PPM
Exposure Time: 6H
Mutation test: Micronucleus test

Species: Rat
Dose: 1 MMOL/L
Cell Type: liver
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Inhalation
Dose: 400 PPM
Mutation test: DNA inhibition

Species: Rat
Dose: 1 MMOL/L
Cell Type: liver
Mutation test: Other mutation test systems

Species: Rat
Dose: 1 MMOL/L
Cell Type: Bone marrow
Mutation test: Other mutation test systems

Species: Rat
Route: Subcutaneous
Dose: 1 GM/L
Mutation test: Other mutation test systems

Species: Rat
Route: Subcutaneous
Dose: 2200 MG/KG
Mutation test: Other mutation test systems

Species: Rat
Route: Inhalation
Dose: 300 MG/M3/16W-I
Mutation test: Cytogenetic analysis

Species: Rat
Route: Subcutaneous
Dose: 2400 MG/KG
Exposure Time: 12D
Mutation test: Cytogenetic analysis

Species: Rat
Route: Intraperitoneal
Dose: 234 MG/KG
Mutation test: Cytogenetic analysis

Species: Rat
Route: Oral
Dose: 39060 UG/KG
Mutation test: Cytogenetic analysis

Species: Rat
Route: Inhalation
Dose: 3 PPM
Exposure Time: 6H
Mutation test: Sister chromatid exchange

Species: Rat
Dose: 1 MMOL/L  
Cell Type: leukocyte  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 12500 NMOL/L  
Cell Type: Embryo  
Mutation test: Micronucleus test

Species: Mouse  
Route: Subcutaneous  
Dose: 440 MG/KG  
Mutation test: Micronucleus test

Species: Mouse  
Route: Oral  
Dose: 40 MG/KG  
Mutation test: Micronucleus test

Species: Mouse  
Route: Intraperitoneal  
Dose: 264 MG/KG  
Exposure Time: 24H  
Mutation test: Micronucleus test

Species: Mouse  
Route: Inhalation  
Dose: 10 PPM  
Exposure Time: 6H  
Mutation test: Micronucleus test

Species: Mouse  
Dose: 62500 UG/L (+S9)  
Cell Type: lymphocyte  
Mutation test: Mutation in microorganisms

Species: Mouse  
Dose: 2500 MG/L (+S9)  
Cell Type: Embryo  
Mutation test: Mutation in microorganisms

Species: Mouse  
Dose: 1 GM/L  
Cell Type: Embryo  
Mutation test: Morphological transformation.

Species: Mouse  
Dose: 150 GM/L  
Cell Type: fibroblast  
Mutation test: Morphological transformation.

Species: Mouse  
Dose: 3840 UMOL/L  
Cell Type: lymphocyte  
Mutation test: DNA damage

Species: Mouse  
Route: Intraperitoneal  
Dose: 2640 MG/KG  
Exposure Time: 3D  
Mutation test: DNA
Species: Mouse  
Route: Oral  
Dose: 2 GM/KG  
Mutation test: Other mutation test systems

Species: Mouse  
Dose: 5 MMOL/L  
Cell Type: Other cell types  
Mutation test: Other mutation test systems

Species: Mouse  
Route: Oral  
Dose: 20 GM/KG  
Mutation test: DNA inhibition

Species: Mouse  
Dose: 10 MMOL/L  
Cell Type: lymphocyte  
Mutation test: Other mutation test systems

Species: Mouse  
Route: Intraperitoneal  
Dose: 880 MG/KG  
Mutation test: DNA inhibition

Species: Mouse  
Route: Inhalation  
Dose: 3000 PPM  
Exposure Time: 4H  
Mutation test: DNA inhibition

Species: Mouse  
Dose: 3 MMOL/L  
Cell Type: Bone marrow  
Mutation test: DNA inhibition

Species: Mouse  
Route: Inhalation  
Dose: 10 PPM  
Exposure Time: 6H  
Mutation test: Sister chromatid exchange

Species: Mouse  
Route: Intraperitoneal  
Dose: 5 GM/KG  
Mutation test: Sister chromatid exchange

Species: Mouse  
Route: Oral  
Dose: 20 MG/KG  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Intraperitoneal  
Dose: 264 MG/KG  
Exposure Time: 3D  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Inhalation  
Dose: 3000 PPM  
Mutation test: Cytogenetic analysis
Species: Mouse
Route: Oral
Dose: 1 MG/KG
Mutation test: Dominant lethal test

Species: Mouse
Route: Intraperitoneal
Dose: 5 MG/KG
Mutation test: Dominant lethal test

Species: Mouse
Dose: 12500 UG/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Mouse
Route: Inhalation
Dose: 40 PPB/6W-C
Mutation test: Mutation in mammalian somatic cells.

Species: Mouse
Route: Oral
Dose: 2 GM/KG
Exposure Time: 5D
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 100 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Hamster
Dose: 17 MMOL/L
Cell Type: ovary
Mutation test: DNA damage

Species: Hamster
Dose: 550 MG/L
Cell Type: lung
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 600 MG/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 750 MG/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 62500 UG/L
Cell Type: liver
Mutation test: SLN

Species: Hamster
Dose: 30 UMOL/L
Cell Type: Embryo
Mutation test: SLN
Species: Hamster  
Dose: 10 UMOL/L  
Cell Type: Embryo  
Mutation test: Mutation in mammalian somatic cells.

Species: Rabbit  
Route: Subcutaneous  
Dose: 2344 MG/KG  
Mutation test: DNA damage

Species: Rabbit  
Route: Subcutaneous  
Dose: 2 GM/KG  
Mutation test: DNA inhibition

Species: Rabbit  
Dose: 1 MMOL/L  
Cell Type: Bone marrow  
Mutation test: Other mutation test systems

Species: Cat  
Dose: 1 MMOL/L  
Cell Type: Bone marrow  
Mutation test: Other mutation test systems

Species: Rabbit  
Route: Subcutaneous  
Dose: 8400 MG/KG  
Mutation test: Cytogenetic analysis

**CHRONIC EXPOSURE – REPRODUCTIVE HAZARD**

Species: Rat  
Dose: 670 MG/M3/24H  
Route of Application: Inhalation  
Exposure Time: (15D PRE/1-22D PREG)  
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat  
Dose: 56600 UG/M3/24H  
Route of Application: Inhalation  
Exposure Time: (1-22D PREG)  
Result: Effects on Newborn: Biochemical and metabolic.

Species: Rat  
Dose: 150 PPM/24H  
Route of Application: Inhalation  
Exposure Time: (7-14D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).  
Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse  
Dose: 12 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 6500 MG/KG  
Route of Application: Oral  
Exposure Time: (8-12D PREG)  
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse  
Dose: 5 MG/KG  
Route of Application: Intraperitoneal  
Exposure Time: (1D MALE)  
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: Fetal death.

Species: Mouse  
Dose: 4 GM/KG  
Route of Application: Parenteral  
Exposure Time: (12D PREG)  
Result: Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4).

Species: Rabbit  
Dose: 1 GM/M3/24H  
Route of Application: Inhalation  
Exposure Time: (7-20D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Abortion. Effects on Embryo or Fetus: Fetal death.

Species: Rabbit  
Dose: 500 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (6-18D PREG)  
Result: Maternal Effects: Other effects.

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Section 12 - Ecological Information

No data available.

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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.

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Section 14 - Transport Information

DOT

Proper Shipping Name: Benzene  
UN#: 1114  
Class: 3  
Packing Group: Packing Group II  
Hazard Label: Flammable liquid  
PIH: Not PIH

IATA

Proper Shipping Name: Benzene
IATA UN Number: 1114
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: F T
Indication of Danger: Highly Flammable. Toxic.
R: 45 11 48/23/24/25
Risk Statements: May cause cancer. Highly flammable. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
S: 53 45
Safety Statements: Restricted to professional users. Attention - 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
Risk Statements: May cause cancer. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes.
Safety Statements: Restricted to professional users. Attention - 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).

UNITED STATES REGULATORY INFORMATION
SARA LISTED: Yes
DEMINIMIS: 0.1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

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. This product is or contains chemical(s) known to the state of California to cause developmental toxicity. This product is or contains chemical(s) known to the state of California to cause male reproductive toxicity.

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

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