Benzene, GR

BENZOL; BENZINE

BX0220

Analytical reagent.

800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)

24 Hours/Day: 7 Days/Week

3/6/2006

3/13/2006

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name
Benzene, GR

Product Code
BX0220

Manufacturer
EMD Chemicals Inc.
P.O. Box 70
480 Democrat Road
Gibbstown, NJ 08027
Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.

Section 2. Composition and Information on Ingredients

Component
Benzene

CAS #
71-43-2

% by Weight
100

Section 3. Hazards Identification

Physical State and Appearance
Liquid. (Colorless.)

Emergency Overview
DANGER!
POISON!
CONTAINS BENZENE.
CANCER HAZARD.
CAN CAUSE CANCER.
EXTREMELY FLAMMABLE LIQUID AND VAPOR.
MAY BE FATAL IF SWALLOWED.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, RESPIRATORY TRACT, SKIN, BONE MARROW, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Routes of Entry
Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Potential Acute Health Effects

Eyes
Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.

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### Medical Conditions Aggravated by Overexposure:

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Hazardous in case of skin contact (permeator, irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Hazardous in case of inhalation (lung irritant).</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Extremely hazardous in case of ingestion. May be fatal if swallowed.</td>
</tr>
</tbody>
</table>

### Potential Chronic Health Effects

**Carcinogenic Effects**

Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union.

### Additional information

See Toxicological Information (section 11)

### Section 4. First Aid Measures

**Eye Contact**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

**Skin Contact**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Inhalation**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Ingestion**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

### Section 5. Fire Fighting Measures

**Flammability of the Product**

Product will burn.

**Auto-ignition Temperature**

591.7°C (1097.1°F)

**Flash Points**

Closed cup: -11.1°C (12°F).

**Flammable Limits**

LOWER: 1.2%  UPPER: 7.8%

**Products of Combustion**

These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances**

Extremely flammable in presence of open flames, sparks and static discharge, of shocks, of heat, of oxidizing materials.

**Explosion Hazards in Presence of Various Substances**

- **Risks of explosion of the product in presence of static discharge:**
  - Extremely flammable in presence of open flames, sparks and static discharge.
  - Extremely explosive in presence of open flames, sparks and static discharge.

- **Risks of explosion of the product in presence of mechanical impact:**
  - Extremely flammable in presence of shocks.
  - Extremely explosive in presence of shocks.

**Fire Fighting Media and Instructions**

- **SMALL FIRE:** Use DRY chemical powder.
- **LARGE FIRE:** Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Protective Clothing (Fire)**

Be sure to use an approved/certified respirator or equivalent.

*Continued on Next Page*
**Section 6. Accidental Release Measures**

**Small Spill and Leak**
Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill and Leak**
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Spill Kit Information**
The following EMD Chemicals Inc. SpillSolv ® absorbent is recommended for this product: SX1330 Solvent Treatment Kit

**Section 7. Handling and Storage**

**Handling**
Keep away from heat, sparks and flame. Keep container closed. Do not ingest. Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or spray mists.

**Storage**
Keep container in a cool, well-ventilated area.

**Section 8. Exposure Controls/Personal Protection**

**Engineering Controls**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection**

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Splash goggles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Lab coat.</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.</td>
</tr>
<tr>
<td>Hands</td>
<td>Gloves.</td>
</tr>
<tr>
<td>Feet</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

**Protective Clothing (Pictograms)**

**Personal Protection in Case of a Large Spill**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Product Name**
Benzene

**Exposure Limits**

- INRS (France, 1996).
  - VME: 16 mg/m³ 8 hour(s).
  - VME: 5 ppm 8 hour(s).
  - AN: 3 mg/m³
- EH40-MEL (United Kingdom (UK), 1997).
  - TWA: 5 ppm 8 hour(s).
- ACGIH (United States, 1994). Skin
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STEL: 8 mg/m³
TWA: 1.6 mg/m³

**NIOSH REL (United States, 1994).**
STEL: 1 ppm 15 minute(s).
TWA: 0.1 ppm 10 hour(s).

**OSHA (United States, 1989).**
STEL: 5 ppm
TWA: 1 ppm

**BMWA_TRK (Austria, 2001). Skin**
STEL: 12.8 mg/m³ 15 minute(s).
STEL: 4 ppm 15 minute(s).
TWA: 3.2 mg/m³ 8 hour(s).
TWA: 1 ppm 8 hour(s).

**NOHSC (Australia, 2002). Notes: National Commission documentation available for these values Substance requiring review**
TWA: 16 mg/m³ 8 hour(s).
TWA: 5 ppm 8 hour(s).

**Lijst Grenswaarden (Belgium, 2002). Skin**
VL: 3.25 mg/m³ 8 hour(s).
VL: 1 ppm 8 hour(s).

**SUVA (Switzerland, 2001). Skin**
MAK: 3.2 mg/m³ 8 hour(s).
MAK: 1 ppm 8 hour(s).

**Ministry of Health (CL, 1992).**
TWA: 26 mg/m³ 8 hour(s).
TWA: 8 ppm 8 hour(s).

**178/2001 (CZ, 2001). Skin**
STEL: 10 mg/m³ 10 minute(s).
STEL: 3.13 ppm 10 minute(s).
TWA: 3 mg/m³ 8 hour(s).
TWA: 0.939 ppm 8 hour(s).

**TRGS900 TRK (Germany, 2002). Skin**
Spitzenbegrenzung: 12.8 mg/m³
Spitzenbegrenzung: 4 ppm
TWA: 3.2 mg/m³ 8 hour(s).
TWA: 1 ppm 8 hour(s).

**Arbejdstilsynet (Denmark, 2000). Skin**
GV: 1.6 mg/m³ 8 hour(s).
GV: 0.5 ppm 8 hour(s).

**INSHT (Spain, 2001). Skin**
TWA: 9.7 mg/m³ 8 hour(s).
TWA: 3 ppm 8 hour(s).

**NAOSH (Ireland, 2002). Skin**
OEL: 3 mg/m³ 8 hour(s).
OEL: 1 ppm 8 hour(s).

**JSOH (Japan, 1996).**
TWA: 32 mg/m³ 8 hour(s).
TWA: 10 ppm 8 hour(s).

**Ministry of Labor (KR, 1997).**
TWA: 30 mg/m³ 8 hour(s).
TWA: 10 ppm 8 hour(s).

**Secretary of Work and Social Security (MX, 1994).**
CCT: 16 mg/m³ 15 minute(s).
CCT: 5 ppm 15 minute(s).
CPT: 3.2 mg/m³ 8 hour(s).
CPT: 1 ppm 8 hour(s).

**Nationale MAC-lijst (Netherlands, 2003). Skin**
TGG 8 uur: 3.25 mg/m³ 8 hour(s).
TGG 8 uur: 1 ppm 8 hour(s).

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### Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Characteristic.</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless.</td>
</tr>
<tr>
<td>Physical State and Appearance</td>
<td>Liquid. (Colorless.)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>78.12 g/mole</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C6-H6</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Boiling/Condensation Point</td>
<td>80.05°C (176.1°F)</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>5.61°C (42.1°F)</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>289°C (552.2°F)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.879 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>2.77  (Air = 1)</td>
</tr>
</tbody>
</table>

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### Section 10. Stability and Reactivity

**Odor Threshold**
4.68 ppm

**Evaporation Rate**
3.5 compared to (n-BUTYL ACETATE=1)

**LogK**
Not available.

**Solubility**
Insoluble in water.

The product is stable.

Highly reactive with oxidizing agents.

Not available.

Will not occur.

### Section 11. Toxicological Information

**RTECS Number:** Benzene CY1400000

**Toxicity**
- Acute oral toxicity (LD_{50}): 930 mg/kg [Rat].
- Acute dermal toxicity (LD_{50}): 48 mg/kg [Mouse].
- Acute toxicity of the vapor (LC_{50}): 10000 ppm 7 hour(s) [Rat].

**Chronic Effects on Humans**
**CARCINOGENIC EFFECTS:** Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union.

**Acute Effects on Humans**
Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (permeator, irritant). Skin irritation is characterized by itching, scaling, reddening, or, occasionally, blistering. Hazardous in case of inhalation (lung irritant). Extremely hazardous in case of ingestion. May be fatal if swallowed.

**Synergetic Products (Toxicologically)**
Not available.

**Irritancy**
Draize Test (Rabbit):
- Eyes: 2mg/24h. Reaction: Severe.
- Skin: 20 mg/24h moderate

**Sensitization**
Not available.

**Carcinogenic Effects**
Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union.

**Toxicity to Reproductive System**
Tests on laboratory animals for reproductive effects are cited in Registry of Toxic Effects on Chemical Substances (RTECS).

**Teratogenic Effects**
Not available.

**Mutagenic Effects**
Tests on laboratory animals for mutagenic effects are cited in Registry of Toxic Effects of Chemical Substances (RTECS).
Section 12. Ecological Information

Ecotoxicity

Ecotoxicity in water (LC50): 9.23 mg/l [EC50, Intoxication], 48 hours [Daphnia (Daphnia magna)].
10 mg/l [EC50, Intoxication], 48 hours [Daphnia (Daphnia magna)].
11.73 mg/l [EC50, Intoxication], 48 hours [Daphnia (Daphnia magna)].
5.3 mg/l [LC50, Mortality], 96 hours [Fish (Oncorhynchus mykiss)].
5.9 mg/l [LC50, Mortality], 96 hours [Fish (Oncorhynchus mykiss)].
9.2 mg/l [LC50, Mortality], 96 hours [Fish (Oncorhynchus mykiss)].

BOD5 and COD

Not available.

Toxicity of the Products of Biodegradation

The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number

U019   D001   D018

Treatment

Always contact a permitted waste disposal (TSD) to assure compliance with all current local, state, and Federal Regulations. Specified Technology - Incineration or fuels blending to less than the TCLP standard. Contact your local permitted waste disposal site (TSD) for permissible treatment sites.

Section 14. Transport Information

DOT Classification

Proper Shipping Name: BENZENE
Hazard Class: 3
UN number: UN1114
Packing Group: II
RQ: 10 lbs. (4.536 kg)

TDG Classification

Not available.

IMO/IMDG Classification

Proper Shipping Name: BENZENE
Hazard Class: 3
UN number: UN1114
Packing Group: II
RQ: 10

ICAO/IATA Classification

Not available.

Section 15. Regulatory Information

U.S. Federal Regulations

TSCA 8(b) inventory: Benzene
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Benzene
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Benzene: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
SARA 313 toxic chemical notification and release reporting: Benzene
Clean Water Act (CWA) 307: Benzene
Clean Water Act (CWA) 311: Benzene
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.

WHMIS (Canada)

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class D-2A: Material causing other toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).

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This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations

<table>
<thead>
<tr>
<th>EINECS</th>
<th>Benzene 200-753-7</th>
</tr>
</thead>
</table>
|                 | R45: May cause cancer.
|                 | R48/23/24/25- Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. |

International Lists

- Australia (NICNAS): Benzene
- China: Benzene
- Germany water class: Benzene
- Japan (MITI): Benzene
- Korea (TCCL): Benzene
- Philippines (RA6969): Benzene
- China: Benzene

State Regulations

- Pennsylvania RTK: Benzene: (special hazard, environmental hazard, generic environmental hazard)
- Massachusetts RTK: Benzene
- New Jersey: Benzene
- California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Benzene
- California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Benzene
- California prop. 65 (no significant risk level): Benzene
- California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Benzene
- California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Benzene

Section 16. Other Information

National Fire Protection Association (U.S.A.)

Fire Hazard

Health

Reactivity

Specific Hazard

Changed Since Last Revision +

Notice to Reader

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The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.