Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Code</th>
<th>Validated on</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENZENE</td>
<td>W117</td>
<td>4/21/2004</td>
</tr>
</tbody>
</table>

Material Uses
Petrochemical manufactured by extraction process of petroleum fraction. Component of crude oil. Found in various refinery streams (e.g., gasoline). Laboratory solvent. Used in manufacture of organic compounds (e.g., detergents, dyes, insecticides).

In case of Emergency
Petro-Canada: 403-296-3000
Canutec Transportation: 613-996-6666
Poison Control Centre: Consult local telephone directory for emergency number(s).

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% (V/V)</th>
<th>TLV-TWA(8 h)</th>
<th>STEL</th>
<th>CEILING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Benzene</td>
<td>71-43-2</td>
<td>99.6</td>
<td>0.5 ppm</td>
<td>2.5 ppm</td>
<td>Not established</td>
</tr>
<tr>
<td>2) Toluene</td>
<td>108-88-3</td>
<td>0.3</td>
<td>50 ppm</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>3) Non-aromatics</td>
<td>Mixture</td>
<td>0.1</td>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

Manufacturer
Petro-Canada
P.O. Box 2844
Calgary, Alberta
T2P 3E3

Other Exposure Limits
Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification

Potential Health Effects
Flammable liquid. Exercise caution when handling this material. Contact with this product may cause skin and eye irritation. Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include: weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. May cause cancer. May cause heritable genetic effects (mutagenicity). For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact
IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.

Skin Contact
Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.

Inhalation
Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.

Ingestion
DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.

Note to Physician
Not available

Section 5. Fire-fighting Measures

Flammability
Class I - flammable liquid (NFPA).

Flammable Limits
LOWER: 1.3%; UPPER: 7.1% (NFPA).

Flash Points
CLOSED CUP: -11°C (12°F)

Auto-Ignition Temperature
498°C (928°F) (NFPA)

Fire Hazards in Presence of Various Substances
Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. This product can accumulate static charge and ignite. May accumulate in confined spaces.

Explosion Hazards in Presence of Various Substances
Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Runoff to sewer may create fire or explosion hazard.

Products of Combustion
Carbon oxides (CO, CO2), aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.
Section 6. Accidental Release Measures

Material Release or Spill

IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Evacuate non-essential personnel. Extinguish all ignition sources. Ventilate area. Stop leak if safe to do so. Ensure clean-up personnel wear appropriate personal protective equipment. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Avoid contact with spilled material. Avoid breathing vapours or mists of material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling

FLAMMABLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Ensure all equipment is grounded/bonded. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Avoid confined spaces and areas with poor ventilation. Avoid contact with any incompatible or reactive materials. Wear proper personal protective equipment (See Section 8). Empty containers may contain product residue. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated. Thoroughly wash all severely contaminated clothing before reuse.

Storage

Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Store away from incompatible and reactive materials (See section 5 and 10). Avoid direct sunlight. Ensure the storage containers are grounded/bonded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls

For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.

Personal Protection - The selection of personal protective equipment varies, depending upon conditions of use.

Eyes

Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.

Body

Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.

Respiratory

Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

Hands

Wear appropriate chemically protective gloves.

Feet

Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State and Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Clear and colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>Sweetish aromatic</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>80°C (176°F) (NFPA)</td>
</tr>
<tr>
<td>Density</td>
<td>0.88 @ 15°C (41°F)</td>
</tr>
<tr>
<td>Vapour Density</td>
<td>2.8 (Air = 1) (NFPA)</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>75 mmHg @ 20°C (NFPA)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Softening Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Dropping Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Penetration</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Oil / Water Dist. Coefficient</td>
<td>Not available</td>
</tr>
<tr>
<td>Ionicity (in water)</td>
<td>Not available</td>
</tr>
<tr>
<td>Dispersion Properties</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Continued on Next Page Internet: www.petro-canada.ca/msds Available in French
### Section 10. Stability and Reactivity

<table>
<thead>
<tr>
<th>Corrosivity</th>
<th>Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>The product is stable under normal handling and storage conditions.</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur under normal working conditions.</td>
</tr>
<tr>
<td>Incompatible Substances / Conditions to Avoid</td>
<td>Reactive with oxidizing agents, acids, chlorine, ozone, peroxides, plastics, rubbers and coatings.</td>
</tr>
<tr>
<td>Decomposition Products</td>
<td>May release COx, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.</td>
</tr>
</tbody>
</table>

### Section 11. Toxicological Information

#### Routes of Entry
- **Skin contact, eye contact, inhalation, and ingestion.**

#### Acute Lethality
- Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below:
  - **Benzene (71-43-2):**
    - Acute oral toxicity (LD50): 930 mg/kg (rat).
    - Acute dermal toxicity (LD50): >9400 mg/kg (rabbit).
    - Acute inhalation toxicity (LC50): 13,700 ppm/4h (rat).
  - **Toluene (108-88-3):**
    - Acute oral toxicity (LD50): 636 mg/kg (rat).
    - Acute dermal toxicity (LD50): 12,124 mg/kg (rabbit).
    - Acute inhalation toxicity (LC50): 8800 ppm/4h (rat).

#### Chronic or Other Toxic Effects
- **Dermal Route:**
  - This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant. Prolonged or repeated contact may defat and dry skin, and cause dermatitis. Harmful if absorbed through the skin.

- **Inhalation Route:**
  - Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

- **Oral Route:**
  - Ingestion of this product may lead to aspiration of the liquid, especially if vomiting occurs. This may result in chemical pneumonitis (inflammation of the lungs) and/or pulmonary edema (an accumulation of fluid in the lungs). Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

- **Eye Irritation/Inflammation:**
  - This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.

#### Immuntotoxicity:
- Not available

#### Skin Sensitization:
- Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.

#### Respiratory Tract Sensitization:
- Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.

#### Mutagenic:
- This product contains a component(s) at >= 0.1% that has been shown to cause mutagenicity in laboratory tests. Therefore, this product is considered to be a mutagen. (Benzene).

#### Reproductive Toxicity:
- This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.

#### Teratogenicity/Embryotoxicity:
- Some test results have shown that Toluene was teratogenic in the absence of maternal toxicity, but the applicability of these results to WHMIS is unknown.

#### Carcinogenicity (ACGIH):
- This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be A1 by the ACGIH. Benzene, 71-43-2)

#### Carcinogenicity (IARC):
- This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be carcinogenic to humans (group 1) by IARC. Benzene, 71-43-2)

#### Carcinogenicity (NTP):
- This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Known to be a human carcinogen according to NTP. Benzene, 71-43-2)

#### Carcinogenicity (IRIS):
- This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be carcinogenic by IRIS. Benzene, 71-43-2)

#### Carcinogenicity (OSHA):
- This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be carcinogenic by OSHA. Benzene, 71-43-2)

#### Other Considerations
- No additional remark.
Section 12. Ecological Information

Environmental Fate

Persistanse/Bioaccumulation Potential Not available

BOD5 and COD

Products of Biodegradation Not available

Additional Remarks

No additional remark.

Section 13. Disposal Considerations

Waste Disposal

Spent/used/waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification

BENZENE, 3, UN1114, PGII (CL-TDG)

Special Provisions for Transport

See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations

This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

DSD/DPD (Europe) Not evaluated.

HCS (U.S.A.) CLASS: Contains material which may cause cancer.

ADR (Europe) (Pictograms)

DOT (U.S.A) (Pictograms)

HMIS (U.S.A.) Health Hazard (2+)

NFPA (U.S.A.) Fire Hazard (3) Reactivity (0) Personal Protection (K)

CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F).

CLASS: Irritating substance.

CLASS: Target organ effects.

Please contact Product Safety for more information.

Section 16. Other Information

References

Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists

ADR - Agreement on Dangerous goods by Road (Europe)

ASTM - American Society for Testing and Materials

BOD5 - Biological Oxygen Demand in 5 days

CAN/CGA B149.2 - Propane Installation Code

CAS - Chemical Abstract Services

CEPA - Canadian Environmental Protection Act

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act

CFR - Code of Federal Regulations

CHIP - Chemicals Hazard Information and Packaging Approved Supply List

COD5 - Chemical Oxygen Demand in 5 days

CPR - Controlled Products Regulations

DOT - Department of Transport

DSCL - Dangerous Substances Classification and Labeling (Europe)

DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)

DSL - Domestic Substance List

EEC/EU - European Economic Community/European Union

EINECS - European Inventory of Existing Commercial Chemical Substances

EPCLI - Emergency Planning and Community Right to Know Act

FDA - Food and Drug Administration

IRIS - Integrated Risk Information System

LD50/LC50 - Lethal Dose/Concentration kill 50%

LDLo/LCLo - Lowest Published Lethal Dose/Concentration


NIRP - National Institute for Occupational Safety & Health

NSRR - New Substances Notification Regulations (Canada)

NTP - National Toxicology Program

OSHA - Occupational Safety & Health Administration

PEL - Permissible Exposure Limit

PGII - Product Group II

RCRA - Resource Conservation and Recovery Act

SARA - Superfund Amendments and Reorganization Act

SD - Single Dose

SDCL - Single Dose Classification and Labeling (Europe)

SL - Single Limit

STEL - Short Term Exposure Limit (15 minutes)

TDLo/TCLo - Lowest Published Toxic Dose/Concentration

TLM - Median Tolerance Limit

TLV-TWA - Threshold Limit Value-Time Weighted Average

USEPA - United States Environmental Protection Agency

USP - United States Pharmacopoeia

Available in French

Internet: www.petro-canada.ca/msds

Continued on Next Page
To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.