



<b>WHMIS (Pictograms)</b>	<b>WHMIS (Classification)</b>	<b>Protective Clothing</b>	<b>TDG (pictograms)</b>
	<b>B-2, D-2A, D-2B</b>		

<b>Section 1. Chemical Product and Company Identification</b>	
<b>Product Name</b> <b>BENZENE</b>	<b>Code</b> W117
<b>Synonym</b> Benzol; aromatic hydrocarbons (C6H6); cyclohexatriene.	<b>Validated on</b> 4/21/2004.
<b>Manufacturer</b> PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	<b>In case of Emergency</b> Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
<b>Material Uses</b> Petrochemical manufactured by extraction process of petroleum fraction. Component of crude oil. Found in various refinery streams (eg. gasoline). Laboratory solvent. Used in manufacture of organic compounds (eg detergents, dyes, insecticides).	

<b>Section 2. Composition and Information on Ingredients</b>					
			<i>Exposure Limits (ACGIH)</i>		
<b>Name</b>	<b>CAS #</b>	<b>% (V/V)</b>	<b>TLV-TWA(8 h)</b>	<b>STEL</b>	<b>CEILING</b>
1) Benzene	71-43-2	99.6	0.5 ppm	2.5 ppm	Not established
2) Toluene	108-88-3	0.3	50 ppm	Not established	Not established
3) Non-aromatics	Mixture	0.1	Not established	Not established	Not established
<b>Manufacturer Recommendation</b>	Not applicable				
<b>Other Exposure Limits</b>	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

<b>Section 3. Hazards Identification.</b>	
<b>Potential Health Effects</b>	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.

<b>Section 4. First Aid Measures</b>	
<b>Eye Contact</b>	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
<b>Skin Contact</b>	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
<b>Inhalation</b>	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.
<b>Ingestion</b>	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
<b>Note to Physician</b>	Not available

<b>Section 5. Fire-fighting Measures</b>			
<b>Flammability</b>	Class I - flammable liquid (NFPA).	<b>Flammable Limits</b>	LOWER: 1.3%; UPPER: 7.1% (NFPA).
<b>Flash Points</b>	CLOSED CUP: -11°C (12°F)	<b>Auto-Ignition Temperature</b>	498°C (928°F) (NFPA)
<b>Fire Hazards in Presence of Various Substances</b>	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.	<b>Explosion Hazards in Presence of Various Substances</b>	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.
<b>Products of Combustion</b>	Carbon oxides (CO, CO2), aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.		

<b>Fire Fighting Media and Instructions</b>	<p>NAERG2000, GUIDE 130, Flammable liquids (Non-polar/ Water-immiscible/ Noxious). CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions.</p> <p>SMALL FIRES: Dry chemical, CO<sub>2</sub>, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. FIRE INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.</p>
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### Section 6. Accidental Release Measures

<b>Material Release or Spill</b>	<p>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.</p>
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### Section 7. Handling and Storage

<b>Handling</b>	<p>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 pressurize, cut, heat, or weld empty containers. 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.</p>
<b>Storage</b>	<p>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.</p>

### Section 8. Exposure Controls/Personal Protection

<b>Engineering Controls</b>	<p>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.</p>
<b>Personal Protection - <i>The selection of personal protective equipment varies, depending upon conditions of use.</i></b>	
<b>Eyes</b>	<p>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.</p>
<b>Body</b>	<p>Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.</p>
<b>Respiratory</b>	<p>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.</p>
<b>Hands</b>	<p>Wear appropriate chemically protective gloves.</p>
<b>Feet</b>	<p>Wear appropriate footwear to prevent product from coming in contact with feet and skin.</p>

### Section 9. Physical and Chemical Properties

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

<b>Volatility</b>	Volatile.	<b>Solubility</b>	Soluble in alcohol, petroleum oil, carbon disulphide, chloroform, ether and acetone. Insoluble in water.
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**Section 10. Stability and Reactivity**

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

**Section 11. Toxicological Information**

<b>Routes of Entry</b>	Skin contact, eye contact, inhalation, and ingestion.		
<b>Acute Lethality</b>	<p>Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below:</p> <p><u>Benzene (71-43-2):</u>          Acute oral toxicity (LD50): 930 mg/kg (rat).          Acute dermal toxicity (LD50): &gt;9400 mg/kg (rabbit).          Acute inhalation toxicity (LC50): 13,700 ppm/4h (rat).</p> <p><u>Toluene (108-88-3):</u>          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).</p>		
<b>Chronic or Other Toxic Effects</b>	<p><b>Dermal Route:</b> This product contains a component (at <math>\geq 1\%</math>) 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.</p> <p><b>Inhalation Route:</b> 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.</p> <p><b>Oral Route:</b> 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.</p> <p><b>Eye Irritation/Inflammation:</b> This product contains a component (at <math>\geq 1\%</math>) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.</p> <p><b>Immunotoxicity:</b> Not available</p> <p><b>Skin Sensitization:</b> Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.</p> <p><b>Respiratory Tract Sensitization:</b> Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.</p> <p><b>Mutagenic:</b> This product contains a component(s) at <math>\geq 0.1\%</math> that has been shown to cause mutagenicity in laboratory tests. Therefore, this product is considered to be a mutagen. (Benzene).</p> <p><b>Reproductive Toxicity:</b> This product is not known to contain any components at <math>\geq 0.1\%</math> 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.</p> <p><b>Teratogenicity/Embryotoxicity:</b> 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.</p> <p><b>Carcinogenicity (ACGIH):</b> This product contains the following chemical(s) at <math>\geq 0.1\%</math> 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)</p> <p><b>Carcinogenicity (IARC):</b> This product contains the following chemical(s) at <math>\geq 0.1\%</math> 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)</p> <p><b>Carcinogenicity (NTP):</b> This product contains the following chemical(s) at <math>\geq 0.1\%</math> 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)</p> <p><b>Carcinogenicity (IRIS):</b> This product contains the following chemical(s) at <math>\geq 0.1\%</math> that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be carcinogenic by IRIS. Benzene, 71-43-2)</p> <p><b>Carcinogenicity (OSHA):</b> This product contains the following chemical(s) at <math>\geq 0.1\%</math> that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. (Considered to be carcinogenic by OSHA. Benzene, 71-43-2)</p>		
<b>Other Considerations</b>	No additional remark.		

**Section 12. Ecological Information**

<b>Environmental Fate</b>	Not available	<b>Persistence/Bioaccumulation Potential</b>	Not available
<b>BOD5 and COD</b>	Not available	<b>Products of Biodegradation</b>	Not available
<b>Additional Remarks</b> No additional remark.			


**Section 13. Disposal Considerations**

<b>Waste Disposal</b>	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.
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**Section 14. Transport Information**

<b>TDG Classification</b>	BENZENE, 3, UN1114, PGII (CL-TDG)	<b>Special Provisions for Transport</b>	See Transportation of Dangerous Goods Regulations.
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**Section 15. Regulatory Information**

<b>Other Regulations</b>	<p>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).</p> <p>All components of this formulation are listed on the US EPA-TSCA Inventory.</p> <p>All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).</p> <p>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.</p> <p>Please contact Product Safety for more information.</p>																																																		
<b>DSD/DPD (Europe)</b>	Not evaluated.	<b>HCS (U.S.A.)</b>	<p>CLASS: Contains material which may cause cancer.</p> <p>CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F).</p> <p>CLASS: Irritating substance.</p> <p>CLASS: Target organ effects.</p>																																																
<b>ADR (Europe) (Pictograms)</b>	<p>NOT EVALUATED FOR EUROPEAN TRANSPORT</p> <p>NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.</p>	<b>DOT (U.S.A) (Pictograms)</b>																																																	
<b>HMIS (U.S.A.)</b>	<table border="1"> <tr> <td>Health Hazard</td> <td>2*</td> </tr> <tr> <td>Fire Hazard</td> <td>3</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> <tr> <td>Personal Protection</td> <td>K</td> </tr> </table>	Health Hazard	2*	Fire Hazard	3	Reactivity	0	Personal Protection	K	<b>NFPA (U.S.A.)</b>	<table border="1"> <tr> <td>Health</td> <td>2</td> <td>Fire Hazard</td> <td>3</td> <td>Reactivity</td> <td>0</td> <td>Rating</td> <td>0 Insignificant</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 Slight</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2 Moderate</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3 High</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4 Extreme</td> </tr> </table> <p><b>Specific hazard</b></p>	Health	2	Fire Hazard	3	Reactivity	0	Rating	0 Insignificant								1 Slight								2 Moderate								3 High								4 Extreme
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**Section 16. Other Information**

<b>References</b>	<p>Available upon request.</p> <p>* Marque de commerce de Petro-Canada - Trademark</p>
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**Glossary**

<p>ACGIH - American Conference of Governmental Industrial Hygienists</p> <p>ADR - Agreement on Dangerous goods by Road (Europe)</p> <p>ASTM - American Society for Testing and Materials</p> <p>BOD5 - Biological Oxygen Demand in 5 days</p> <p>CAN/CGA B149.2 Propane Installation Code</p> <p>CAS - Chemical Abstract Services</p> <p>CEPA - Canadian Environmental Protection Act</p> <p>CERCLA - Comprehensive Environmental Response, Compensation and Liability Act</p> <p>CFR - Code of Federal Regulations</p> <p>CHIP - Chemicals Hazard Information and Packaging Approved Supply List</p> <p>COD5 - Chemical Oxygen Demand in 5 days</p> <p>CPR - Controlled Products Regulations</p> <p>DOT - Department of Transport</p> <p>DSCL - Dangerous Substances Classification and Labeling (Europe)</p> <p>DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)</p> <p>DSL - Domestic Substance List</p> <p>EEC/EU - European Economic Community/European Union</p> <p>EINECS - European Inventory of Existing Commercial Chemical Substances</p> <p>EPCRA - Emergency Planning and Community Right to Know Act</p> <p>FDA - Food and Drug Administration</p>	<p>IRIS - Integrated Risk Information System</p> <p>LD50/LC50 - Lethal Dose/Concentration kill 50%</p> <p>LDLo/LCLo - Lowest Published Lethal Dose/Concentration</p> <p>NAERG'96 - North American Emergency Response Guide Book (1996)</p> <p>NFPA - National Fire Prevention Association</p> <p>NIOSH - National Institute for Occupational Safety &amp; Health</p> <p>NPRI - National Pollutant Release Inventory</p> <p>NSNR - New Substances Notification Regulations (Canada)</p> <p>NTP - National Toxicology Program</p> <p>OSHA - Occupational Safety &amp; Health Administration</p> <p>PEL - Permissible Exposure Limit</p> <p>RCRA - Resource Conservation and Recovery Act</p> <p>SARA - Superfund Amendments and Reorganization Act</p> <p>SD - Single Dose</p> <p>STEL - Short Term Exposure Limit (15 minutes)</p> <p>TDG - Transportation Dangerous Goods (Canada)</p> <p>TDLo/TCLo - Lowest Published Toxic Dose/Concentration</p> <p>TLm - Median Tolerance Limit</p> <p>TLV-TWA - Threshold Limit Value-Time Weighted Average</p> <p>TSCA - Toxic Substances Control Act</p> <p>USEPA - United States Environmental Protection Agency</p> <p>USP - United States Pharmacopoeia</p>
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FIFRA - Federal Insecticide, Fungicide and Rodenticide Act  
HCS - Hazardous Communication System  
HMIS - Hazardous Material Information System  
IARC - International Agency for Research on Cancer

WHMIS - Workplace Hazardous Material Information System

**For Copy of MSDS**

Internet: [www.petro-canada.ca/msds](http://www.petro-canada.ca/msds)

Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax:  
1-800-837-1228

Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 4/21/2004.

Data entry by Product Safety - RS.

*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.*