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## **BENZENE- MATERIAL SAFETY DATA SHEET**

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### **24 Hour EMERGENCY CONTACT**

**U.S- CHEMTREC 1-800-424-9300**

**CANADA- CANUTEC 613-996-6666**

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## **1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

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### **Matheson Tri-Gas, Inc.**

*The telephone numbers listed below are emergency numbers, please contact your local branch for routine inquiries.*

#### **USA**

959 Route 46 East  
Parsippany, New Jersey  
07054-0624 USA  
**Phone: 973-257-1100**

#### **CANADA**

530 Watson Street  
Whitby, Ontario  
L1N 5R9 Canada  
**Phone: 905-668-3570**

**SUBSTANCE: BENZENE**

**SYMBOL:** C<sub>6</sub>H<sub>6</sub>

**TRADE NAMES/SYNONYMS:**

BENZOL; CYCLOHEXATRIENE; BENZOLE; PHENE; PYROBENZOL; PYROBENZOLE;  
CARBON OIL; COAL TAR NAPHTHA; PHENYL HYDRIDE; BENZOLENE; BICARBURET OF  
HYDROGEN; COAL NAPHTHA; MOTOR BENZOL; ANNULENE; (6)ANNULENE; RCRA U019;  
STCC 4908110; UN 1114; C6H6; MAT02610; RTECS CY1400000

**CHEMICAL FAMILY:** hydrocarbons, aromatic

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Mar 16 1999

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**2. COMPOSITION, INFORMATION ON INGREDIENTS**

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**COMPONENT:** BENZENE

**CAS NUMBER:** 71-43-2

**EC NUMBER (EINECS):** 200-753-7

**PERCENTAGE:** >99

**COMPONENT:** THIOPHENE

**CAS NUMBER:** 110-02-1

**EC NUMBER (EINECS):** 203-729-4

**PERCENTAGE:** 0.00010

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**3. HAZARDS IDENTIFICATION**

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**NFPA RATINGS (SCALE 0-4):** HEALTH=3 FIRE=3 REACTIVITY=0

**WHMIS CLASSIFICATION:** BD2

**EC CLASSIFICATION (ASSIGNED):**

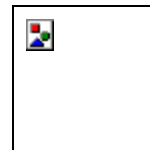
F Highly Flammable

T Toxic

Carcinogen Category 1

R 11-45-48/23/24/25

EC Classification may be inconsistent with independently-researched data.



**EMERGENCY OVERVIEW:**

**Color:** colorless to yellow

**Physical Form:** liquid

**Major Health Hazards:** respiratory tract irritation, skin irritation, eye irritation, central nervous system depression, cancer hazard (in humans)

**Physical Hazards:** Flammable liquid and vapor. Vapor may cause flash fire.

**POTENTIAL HEALTH EFFECTS:****INHALATION:**

**Short Term Exposure:** irritation, ringing in the ears, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, symptoms of drunkenness, disorientation, blurred vision, lung congestion, blood disorders, paralysis, convulsions, coma

**Long Term Exposure:** hearing loss, visual disturbances, reproductive effects, brain damage, cancer

**SKIN CONTACT:**

**Short Term Exposure:** irritation, blisters

**Long Term Exposure:** tingling sensation

**EYE CONTACT:**

**Short Term Exposure:** irritation

**Long Term Exposure:** no information on significant adverse effects

**INGESTION:**

**Short Term Exposure:** nausea, vomiting, chest pain, headache, drowsiness, symptoms of drunkenness, disorientation, visual disturbances, lung congestion, paralysis, convulsions, coma

**Long Term Exposure:** impotence, cancer

**CARCINOGEN STATUS:**

**OSHA:** Y

**NTP:** Y

**IARC:** Y

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**4. FIRST AID MEASURES**

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**INHALATION:**

When safe to enter area, remove from exposure. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Keep warm and at rest. Get medical attention immediately.

**SKIN CONTACT:**

Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

**EYE CONTACT:**

Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

**INGESTION:**

Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**NOTE TO PHYSICIAN:**

For inhalation, consider oxygen. For ingestion, consider gastric lavage.

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**5. FIRE FIGHTING MEASURES**

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**FIRE AND EXPLOSION HAZARDS:**

Severe fire hazard. Moderate explosion hazard. Vapor/air mixtures are explosive. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

**EXTINGUISHING MEDIA:**

regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

**FIRE FIGHTING:**

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Water may be ineffective.

**FLASH POINT:**

12 F (-11 C) (CC)

**LOWER FLAMMABLE LIMIT:**

1.2%

**UPPER FLAMMABLE LIMIT:**

7.8%

**AUTOIGNITION:**

928 F (498 C)

**FLAMMABILITY CLASS (OSHA):**

IB

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**6. ACCIDENTAL RELEASE MEASURES**

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**AIR RELEASE:**

Reduce vapors with water spray. Stay upwind and keep out of low areas.

**SOIL RELEASE:**

Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material.

**WATER RELEASE:**

Cover with absorbent sheets, spill-control pads or pillows. Apply detergents, soaps, alcohols or another surface active agent. Collect with absorbent into suitable container. Absorb with activated carbon. Remove trapped material with suction hoses. Collect spilled material using mechanical equipment. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

**OCCUPATIONAL RELEASE:**

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Reportable Quantity (RQ): Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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**7. HANDLING AND STORAGE**

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Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Keep separated from incompatible substances. Keep separated from incompatible substances.

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**8. EXPOSURE CONTROLS, PERSONAL PROTECTION**

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**EXPOSURE LIMITS:****BENZENE:**

1 ppm OSHA TWA

5 ppm OSHA STEL 15 minute(s)

0.5 ppm OSHA action level

0.5 ppm (1.6 mg/m<sup>3</sup>) ACGIH TWA

2.5 ppm (8 mg/m<sup>3</sup>) ACGIH STEL

0.1 ppm (0.32 mg/m<sup>3</sup>) NIOSH recommended TWA 8 hour(s)

1 ppm (3.2 mg/m<sup>3</sup>) NIOSH recommended ceiling 15 minute(s)

**VENTILATION:** Provide local exhaust or process enclosure ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves. OSHA REGULATED SUBSTANCES: U.S. OSHA 29 CFR 1910.1028.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

**10 ppm**

Any air-purifying respirator with a full facepiece and an organic vapor canister.

**50 ppm**

Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

**100 ppm**

Any powered, air-purifying respirator with a full facepiece and organic vapor cartridge(s).

**1000 ppm**

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

**Escape -**

Any air-purifying respirator with a full facepiece and an organic vapor canister.

Any self-contained breathing apparatus with a full facepiece.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** liquid

**COLOR:** colorless to yellow

**ODOR:** distinct odor

**MOLECULAR WEIGHT:** 78.11

**MOLECULAR FORMULA:** C6-H6

**BOILING POINT:** 176 F (80 C)

**FREEZING POINT:** 43 F (6 C)

**VAPOR PRESSURE:** 75 mmHg @ 20 C

**VAPOR DENSITY (air=1):** 2.8

**SPECIFIC GRAVITY (water=1):** 0.8765 @ 20 C

**WATER SOLUBILITY:** 0.18% @ 25 C

**PH:** Not available

**VOLATILITY:** 100%

**ODOR THRESHOLD:** 4.68 ppm

**EVAPORATION RATE:** 5.1 (butyl acetate=1)

**VISCOSITY:** 0.6468 cP @ 20 C

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available

**SOLVENT SOLUBILITY:**

**Soluble:** acetone, alcohol, carbon disulfide, acetic acid, carbon tetrachloride, chloroform, ether, oils

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:**

Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:**

Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:**

acids, bases, halogens, oxidizing materials, metal salts

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products: oxides of carbon

**POLYMERIZATION:**

Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**BENZENE:**

**IRRITATION DATA:**

15 mg/24 hour(s) open skin-rabbit mild; 20 mg/24 hour(s) skin-rabbit moderate; 88 mg eyes-rabbit moderate; 2 mg/24 hour(s) eyes-rabbit severe

**TOXICITY DATA:**

10000 ppm/7 hour(s) inhalation-rat LC50; >9400 ul/kg skin-rabbit LD50; 930 mg/kg oral-rat LD50

**CARCINOGEN STATUS:**

OSHA: Carcinogen; NTP: Known Human Carcinogen; IARC: Human Sufficient Evidence, Animal Sufficient Evidence, Group 1; ACGIH: A1 -Confirmed Human Carcinogen; EC: Category 1

**LOCAL EFFECTS:**

Irritant: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Highly Toxic: dermal absorption

Moderately Toxic: ingestion  
Slightly Toxic: inhalation

**TARGET ORGANS:**

immune system (blood), central nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:**

blood system disorders, immune system disorders or allergies

**TUMORIGENIC DATA:**

Available.

**MUTAGENIC DATA:**

Available.

**REPRODUCTIVE EFFECTS DATA:**

Available.

**ADDITIONAL DATA:**

May cross the placenta. Alcohol may enhance the toxic effects. Interactions with drugs may occur.

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## **12. ECOLOGICAL INFORMATION**

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**ECOTOXICITY DATA:**

**FISH TOXICITY:**

9200 ug/L 96 hour(s) LC50 (Mortality) Rainbow trout,donaldson trout (Oncorhynchus mykiss)

**INVERTEBRATE TOXICITY:**

10000 ug/L 48 hour(s) EC50 (Immobilization) Water flea (Daphnia magna)

**ALGAL TOXICITY:**

41000 ug/L 8 hour(s) EC50 (Growth) Green algae (Selenastrum capricornutum)

**OTHER TOXICITY:**

25 ug/L 24 day(s) (Residue) Wood frog (Rana sylvatica)

**FATE AND TRANSPORT:**

**BIOCONCENTRATION:**

4360 ug/L 24 day(s) BCF (Residue) Northern anchovy (Engraulis mordax) 97 ug/L

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## **13. DISPOSAL CONSIDERATIONS**

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Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U019. Hazardous Waste Number(s): D018. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.5 mg/L. Dispose in accordance with all applicable regulations.

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## 14. TRANSPORT INFORMATION

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-/SELECTION-->**U.S. DOT 49 CFR 172.101. SHIPPING NAME-UN NUMBER; HAZARD CLASS; PACKING GROUP; LABEL:**  
Benzene-UN1114; 3; II; Flammable liquid

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS:

**TSCA INVENTORY STATUS:** Y

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CERCLA SECTION 103 (40CFR302.4):** Y  
**Benzene:** 10 LBS RQ

**SARA SECTION 302 (40CFR355.30):** N

**SARA SECTION 304 (40CFR355.40):** N

**SARA SECTION 313 (40CFR372.65):**Y  
**Benzene**

**SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):**

**ACUTE:** Y

**CHRONIC:** Y

**FIRE:** Y

**REACTIVE:** N

**SUDDEN RELEASE:** N

**OSHA PROCESS SAFETY (29CFR1910.119):** N

### STATE REGULATIONS:

**California Proposition 65:** Y

Known to the state of California to cause the following:

**Benzene**

Cancer (Feb 27, 1987)

Developmental toxicity (Dec 26, 1997)

Male reproductive toxicity (Dec 26, 1997)

### EUROPEAN REGULATIONS:

**EC NUMBER (EINECS):** 200-753-7

### EC RISK AND SAFETY PHRASES:

R 11	Highly flammable.
R 45	May cause cancer.
R 48/23/24/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
S 45	In case of accident or if you feel unwell, seek medical advice

	immediately (show the label where possible).
S 53	Avoid exposure - obtain special instructions before use.

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## 16. OTHER INFORMATION

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