



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Benzene**

Chemical formula : C₆H₆

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, UN 1114

Company : Specialty Gases of America, Inc
6055 Brent Dr.
Toledo, OH 43611

Telephone : 419-729-7732

Emergency : 800-424-9300

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Benzene	71-43-2	99+%
Thiophene	110-02-1	0.00010

3. Hazards Identification

Emergency Overview

Flammable liquid and vapor. Vapor may cause flash fire.

May cause respiratory tract irritation, skin irritation, eye irritation, central nervous system depression, cancer hazard (in humans).

Potential Health Effects

Inhalation : 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, convulsion, coma. May cause hearing loss, visual disturbances, reproductive effects, brain damage, cancer in long term exposure.

Eye contact : Irritation.

Skin contact : Irritation, blisters. May cause tingling sensation in long term exposure.

Ingestion : Nausea, vomiting, chest pain, headache, drowsiness, symptoms of drunkenness, disorientation, visual disturbances, lung congestion, paralysis, convulsion, coma. May cause impotence, cancer in long term exposure.

Chronic Health Hazard : Not applicable.

4. First Aid Measures

General advice : None.

Eye contact : Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

- Skin contact : Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.
- 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.
- Inhalation : If adverse effects occur, remove to contaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

5. Fire-Fighting Measures

- Suitable extinguishing media : Regular dry chemical carbon dioxide water regular foam.
Large fires: Use regular foam or flood with fine water spray.
- Specific 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.
- 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 well after fire is out. If this is impossible, 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.

6. Accidental Release Measures

- 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 : Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers. 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.
- 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 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. Notify Local Emergency Planning Committee and State Emergency Response Committee 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).

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Subject to storage regulation: 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.

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH	:	0.5 ppm TWA 2.5 ppm STEL Skin – potential significant contribution to overall exposure by the cutaneous route
OSHA (final)	:	5 ppm STEL (see 29 CFR 1910.1028) 10 ppm TWA applies to industry segments except from the benzene standard at 29 CFR 1910.1028; 1 ppm TWA 25 ppm Ceiling
OSHA (vacated)	:	50 ppm STEL unless specified in 1910.1028 10 minute 10 ppm TWA unless specified in 1910.1028 25 ppm Ceiling unless specified in 1910.1028
NIOSH	:	1 ppm STEL 0.1 ppm TWA

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.

Personal protective equipment

Respiratory protection	:	The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. OSHA Standard: Respirator selection should comply with 29 CFR 1910.134, 29 CFR 1910.1028 and the final rule published in the Federal Register on August 24, 2006. NIOSH Recommendations: At any detectable concentration – 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 pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in positive-demand or other positive-pressure mode. Escape – Any air-purifying respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister. Any escape-type, self-contained breathing apparatus.
Hand protection	:	Wear appropriate chemical resistant gloves. OSHA REGULATED SUBSTANCES: U.S. OSHA 29 CFR 1910.1028.
Eye protection	:	Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection	:	Wear appropriate chemical resistant clothing.

9. Physical and Chemical Properties

Form	:	Liquid.
Color	:	Colorless to yellow.

Odor	: Distinct odor.
Molecular weight	: 78.11
Vapor pressure	: 75 mmHg @ 20°C
Vapor density	: 2.8 (air = 1)
Specific gravity	: 0.8765 @ 20°C (water = 1)
Boiling point	: 176°F (80°C)
Melting point	: 43°F (6°C)
Water solubility	: 0.18% @ 25°C
Solvent solubility	: Soluble: acetone, alcohol, carbon disulfide, acetic acid, carbon tetrachloride, chloroform, ether, oils.
Evaporation rate	: 5.1 (butyl acetate = 1)

10. Stability and Reactivity

Stability	: Stable under normal conditions.
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.
Materials to avoid	: Acids, bases, halogens, oxidizing materials, metal salts.
Hazardous decomposition products	: Thermal decomposition products: oxides of carbon.

11. Toxicological Information

The components of this material have been reviewed in various sources and the following selected endpoints are published:

BENZENE (71-43-2)	: Inhalation LC50 Rat: 13050-14380 ppm/4H; Oral LD50 Rat: 1800 mg/kg
THIOPHENE (110-02-1)	: Oral LD50 Rat: 1400 mg/kg

Acute Toxicity Level

BENZENE (71-43-2)	: Highly toxic: dermal absorption. Moderately toxic: ingestion. Slightly toxic: inhalation.
THIOPHENE (110-02-1)	: Toxic: inhalation. Moderately toxic: ingestion.

Component Carcinogenicity

BENZENE (71-43-2)	: ACGIH: A1 – Confirmed Human Carcinogen IARC: Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans)) DFG: Category 1 (causes cancer in man) Present Known Human Carcinogen
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Local Effects

BENZENE (71-43-2)	: Irritant: inhalation, skin, eye.
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Target Organs

BENZENE (71-43-2)	: Immune system (blood), central nervous system.
THIOPHENE (110-02-1)	: Central nervous system.

Medical Conditions Aggravated by Exposure

Blood system disorders, immune system disorders or allergies.

Additional Data

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

12. Ecological Information

Ecotoxicity Data

BENZENE (71-43-2) : Fish:
96 Hr LC50 Pimephales promelas: 10.7 – 14.7 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 5.3 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 22.49 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 28.6 mg/L [static]; 96 Hr LC50 Pimephales promelas: 22330 – 41160 µg/L [static]; 96 Hr LC50 Lepomis macrochirus: 70000 – 142000 µg/L [static]

Algae:
72 Hr EC50 Pseudokirchneriella subcapitata: 29 mg/L

Invertebrate:
48 Hr EC50 Daphnia magna: 8.76 – 15.6 mg/L [static]; 48 Hr EC50 Daphnia magna: 10 mg/L

13. Disposal Considerations

Waste from residues / unused products : 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.

Contaminated packaging : Return cylinder to supplier.

Component Waste Numbers

BENZENE (71-43-2) : RCRA: waste_number U019 (Ignitable waste; Toxic waste)
0.5 mg/L regulatory level

14. Transport Information

DOT (US only)

Proper shipping name : Benzene
Class : 3, Packing Group II
UN/ID No. : UN1114
Labeling : Flammable Liquid

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

BENZENE (71-43-2) – 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 1989 final rule)

BENZENE (71-43-2) – SARA 313: 0.1% de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 1989 final rule)

SARA 311/312

Acute: Yes
Chronic: Yes
Fire: Yes
Reactive: No
Pressure: No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
BENZENE	71-43-2	Yes	Yes	Yes	Yes	Yes	Yes
THIOPHENE	110-02-1	No	Yes	No	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enhancement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

16. Other Information

Prepared by : Specialty Gases of America, Inc.

For additional information, please visit our website at www.americangasgroup.com.