MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**BENZENE**
Catalog #	860
Version #	02
Revision date	29-Feb-2008
CAS #	71-43-2
Synonym(s)	BENZOL
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 US www.gfschemicals.com Fax 740-881-5989 Phone 740-881-5501 Toll Free 800-858-9682 Emergency Assistance Chemtrec 800-424-8300

2. Hazards Identification

Emergency overview	DANGER EXTREMELY FLAMMABLE LIQUID AND VAPOR. Vapors may cause flash fire or explosion. Will be easily ignited by heat, spark or flames. Cancer hazard. Prolonged exposure may cause chronic effects.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Ingestion. Inhalation. Skin contact. Eye contact.
Eyes	Irritating to eyes. Avoid contact with eyes.
Skin	Irritating to skin. Avoid contact with the skin.
Inhalation	Avoid breathing dust/fume/gas/mist/vapors/spray.
Ingestion	Do not ingest.
Potential environmental effects	Components of this product are hazardous to aquatic life. May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
BENZENE	71-43-2	90 - 100

Composition comments

US OSHA Table Z-2: Ceiling Limit Value

BENZENE	71-43-2	25 PPM

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops or persists.
Skin contact	Immediately take off all contaminated clothing. Rinse skin with water/shower.
Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Ingestion	Rinse mouth. If swallowed, seek medical advice immediately and show this container or label.
General advice	If you feel unwell, seek medical advice (show the label where possible).

5. Fire Fighting Measures

Flammable properties	Flammable by OSHA criteria. Containers may explode when heated. Vapor or gas may spread to distant ignition sources and flash back. Runoff to sewer may cause fire or explosion hazard.
Extinguishing media	
Suitable extinguishing media	Water. Foam. Carbon dioxide (CO_2).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Protection of firefighters	
Specific hazards arising from the chemical	Carbon monoxide, carbon dioxide, various hydrocarbon fragments as well as thick smoke.
Protective equipment and precautions for firefighters	In the event of fire and/or explosion do not breathe fumes. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. 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. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Move containers from fire area if you can do it without risk. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.
Specific methods	In the event of fire and/or explosion do not breathe fumes. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions	Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Stay upwind. Keep out of low areas.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Should not be released into the environment. Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean contaminated surface thoroughly. After removal flush contaminated area thoroughly with water. Never return spills in original containers for re-use.

7. Handling and Storage

Handling	Vapors may form explosive mixtures with air. Do not handle or store near an open flame, heat or other sources of ignition. Do not smoke. All equipment used when handling the product must be grounded. Use only in area provided with appropriate exhaust ventilation. Wash thoroughly after handling. Avoid release to the environment. Handle and open container with care.
Storage	The pressure in sealed containers can increase under the influence of heat. Keep away from heat and sources of ignition. Store in cool place. Refrigeration recommended. Keep in a well-ventilated place. Keep container tightly closed. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Keep in an area equipped with sprinklers. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Material	CAS #	Type	Value	Form
BENZENE	71-43-2	STEL	2.5 ppm	
		TWA	0.5 ppm	

U.S. - OSHA

Material	CAS #	Type	Value	Form
BENZENE	71-43-2	Ceiling	25 ppm	
		STEL	5 ppm	
		TWA	1 ppm	

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.

Hand protection Protective gloves.

Eye / face protection Wear chemical goggles.

Skin protection No special protective equipment required.

General hygeine considerations When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance Clear.

Color Clear. Colorless.

Odor aromatic

Odor threshold Not available.

Physical state Liquid.

Form Liquid.

pH Not available.

Melting point 42.8 °F (5.5 °C) estimated

Freezing point 42.8 °F (5.5 °C)

Boiling point 176 °F (80.1 °C) estimated

Flash point 12 °F (-11.1 °C) estimated Closed Cup

Evaporation rate Not available.

Flammability Not available.

Flammability limits in air, upper, % by volume 8 %

Flammability limits in air, lower, % by volume 1.4 %

Vapor pressure 12.6387 kPa at 25°C

Vapor density 2.8

Specific gravity Not available.

Relative density Not available.

Solubility (water) 0.07 %

Partition coefficient (n-octanol/water) 2.13

Auto-ignition temperature 928 °F (497.8 °C) estimated

Decomposition temperature Not available.

VOC 100 % estimated

Percent volatile 100 % estimated

Molecular weight	78.1100 g/mol
Molecular formula	C6H6

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions. Risk of ignition.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	May include oxides of carbon. Hydrocarbons
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Sensitization

US ACGIH Threshold Limit Values: Skin designation

BENZENE	71-43-2	Can be absorbed through the skin.

Acute effects

Acute Inhalation Toxicity: LC50 value

BENZENE	71-43-2	Mouse 9980 mg/l

Acute Oral Toxicity: LD50 value

BENZENE	71-43-2	Rat 3306 mg/kg

Toxicology data for the preparation

Acute LC50: 9980 mg/l, Mouse, Inhalation
Acute LC50: 10000 mg/l, Rat, Inhalation
Acute LD50: 4700 mg/kg, Mouse, Oral
Acute LD50: 3306 mg/kg, Rat, Oral

Chronic effects Prolonged exposure may cause chronic effects.

Carcinogenicity Cancer hazard. Risk of cancer cannot be excluded with prolonged exposure.

IARC Monographs on Occupational Exposures to Chemical Agents: Evidence of carcinogenicity in humans

BENZENE	71-43-2	Sufficient data.

US ACGIH Threshold Limit Values: A1 carcinogen

BENZENE	71-43-2	Group A1 Confirmed human carcinogen.

US NTP Report on Carcinogens: Known carcinogen

BENZENE	71-43-2	Known carcinogen.

US OSHA Specifically Regulated Substances: Cancer hazard

BENZENE	71-43-2	Cancer hazard.

12. Ecological Information

Ecotoxicity Components of this product are hazardous to aquatic life.

Invertebrate Toxicity: EC50 value

BENZENE	71-43-2	Water flea (Daphnia magna) 8.76 - 15.6 mg/l 48 h Static Intoxication

Environmental effects	Harmful to aquatic life.
Persistence and degradability	Not available.
Partition coefficient	2.13

13. Disposal Considerations

Waste codes D001: Waste Flammable material with a flash point <140 F
D018: Waste Benzene

US RCRA Hazardous Waste U List: Reference

BENZENE	71-43-2	U019

Disposal instructions Dispose of this material and its container at hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. Do not allow this material to drain into sewers/water supplies. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose in accordance with all applicable regulations.

14. Transport Information

DOT

Basic shipping requirements:

Proper shipping name	Benzene
Hazard class	3
UN number	UN1114
Packing group	II
Additional information:	
Special provisions	IB2, T4, TP1
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242
ERG number	130

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

BENZENE	71-43-2	0.1 %

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	Yes
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

BENZENE	71-43-2	Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

BENZENE	71-43-2	Listed: February 27, 1987 Carcinogenic.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

BENZENE	71-43-2	Listed: December 26, 1997 Developmental toxin.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

BENZENE	71-43-2	Listed: December 26, 1997 Male reproductive toxin.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

BENZENE	71-43-2	500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

BENZENE	71-43-2	Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard

BENZENE	71-43-2	Special hazard.

16. Other Information

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings Health: 1*
Flammability: 3
Physical hazard: 0

NFPA ratings Health: 1
Flammability: 3
Instability: 0

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This data sheet contains changes from the previous version in section(s): This document has undergone significant changes and should be reviewed in its entirety.