

Material Safety Data Sheet

Benzene

1 . Product and company identification

Common name : Benzene
Supplier/Manufacturer : ABCHEM Inc.
 1234, Safety
 Newest, EA
 007-008

In case of emergency : CANUTEC (613) 996-6666
 CHEMTREC, U.S. : (800) 424-9300 International: (703) 527-3887

2 . Composition/information on ingredients

Name	CAS number	%
Benzene	71-43-2	100

See Toxicological Information (section 11)

3 . Hazards identification

Physical state : Liquid.

Odour : Characteristic.

Colour : Colourless to light yellow.

Emergency overview : WARNING !
 EXTREMELY FLAMMABLE LIQUID AND VAPOUR.
 CANCER HAZARD.
 CAN CAUSE CANCER.
 CAUSES EYE AND SKIN IRRITATION.
 CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, RESPIRATORY TRACT,
 SKIN, BONE MARROW , CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
 VAPOUR MAY CAUSE FLASH FIRE.
 MAY BE HARMFUL IF SWALLOWED.

Do not ingest. Avoid contact with skin and clothing. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes : Irritating to eyes.

Skin : Irritating to skin.

Inhalation : No known significant effects or critical hazards.

Ingestion : May be harmful if swallowed.

Potential chronic health effects : Carcinogenic effects: Classified A1 (Confirmed for humans.) by ACGIH, 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union.
 Mutagenic effects: Not available.
 Teratogenic effects: Not available.

Medical conditions aggravated by over-exposure : Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.

See toxicological information (section 11)

4 . First-aid measures

- Eye contact** : Check for and remove any contact lenses. In case of contact with eyes, rinse immediately with plenty of water. Get medical attention.
- Skin contact** : In case of contact, immediately flush skin copiously with water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention.
- Ingestion** : Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.
- Notes to physician** : No specific antidote, medical staff contact Poisons Information Centre.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

5 . Fire-fighting measures

- Flammability of the product** : Flammable.
- Products of combustion** : These products are carbon oxides.
- Extinguishing media**
- Suitable** : Use dry chemical, carbon dioxide, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Extremely flammable liquid and vapour. Vapour may cause flash fire. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilt material.
- Environmental precautions** : Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : If emergency personnel are unavailable, contain spilt material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dyke spilt material or otherwise contain material to ensure runoff does not reach a waterway. Place spilt material in an appropriate container for disposal.

7 . Handling and storage

- Handling** : Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not ingest. If ingested, do not induce vomiting. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.
- Storage** : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8 . Exposure controls/personal protection

Product name	Exposure limits
Benzene	Ministry of Manpower (MOM) (Singapore): TWA: 5 ppm; 16 mg/m ³

- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

- Eyes** : Safety glasses.
- Skin** : Lab coat.
- Respiratory** : Vapour respirator.
- Hands** : Nitrile rubber.



- Personal protection in case of a large spill** : Safety glasses, goggles or face shield. Impervious gloves. Full suit. Boots. Wear NIOSH-approved self-contained breathing apparatus or equivalent and full protective gear.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling compounds and before eating, smoking and using the lavatory and at the end of the day. During formulation, follow good industrial hygiene practice.

9 . Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : Closed cup: -11.15°C (11.9°F).(Pensky-Martens.)
- Auto-ignition temperature** : 591.65°C (1097°F)
- Colour** : Colourless to light yellow.
- Odour** : Characteristic.
- Molecular weight** : 78.12
- Molecular formula** : C₆H₆
- Boiling/condensation point** : 80°C (176°F)
- Melting/freezing point** : 5.56°C (42°F)
- Critical temperature** : 289°C (552.2°F)
- Relative density** : 0.879 (Water = 1)

- Vapour density** : 2.77 (Air = 1)
Evaporation rate : 3.5 compared with Butyl acetate.
Solubility : Very slightly soluble in cold water, hot water.

10 . Stability and reactivity

- Stability and reactivity** : The product is stable.
Incompatibility with various substances : Reactive with oxidizing materials, acids and alkalis.
Hazardous polymerisation : Will not occur.
Conditions of reactivity : Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts.

11 . Toxicological information

Product/ingredient name	Toxicity data			
	Test	Result	Route	Species
Benzene	LD50	930 mg/kg	Oral	Rat
	LD50	4700 mg/kg	Oral	Mouse
	LD50	5700 mg/kg	Oral	Mammal
	LD50	48 mg/kg	Dermal	Mouse

- IDLH** : 500 ppm
- Acute effects**
- Eyes** : Irritating to eyes.
- Skin** : Irritating to skin.
- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : May be harmful if swallowed.
- Potential chronic health effects** : Carcinogenic effects Classified A1 (Confirmed for humans.) by ACGIH, 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union.
 Mutagenic effects Not available.
 Teratogenic effects: Not available.
- Target organs** : Causes damage to the following organs: blood, upper respiratory tract, skin, eyes, bone marrow, central nervous system (CNS), eye, lens or cornea.

12 . Ecological information

Product/ingredient name	Ecotoxicity data		
	Species	Period	Result
Benzene	Daphnia magna (EC50)	48 hour(s)	9.23 mg/l
	Daphnia magna (EC50)	48 hour(s)	10 mg/l
	Daphnia magna (EC50)	48 hour(s)	11.73 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	5.3 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	5.9 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	9.2 mg/l

- Environmental precautions** : No known significant effects or critical hazards.
- Products of degradation** : These products are carbon oxides and water.
- Toxicity of the products of biodegradation** : The products of degradation are less toxic than the product itself.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional and local authority requirements.

14 . Transport information

Regulatory information	Proper shipping name	Class	UN number	PG	Label
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DOT Classification	BENZENE	3	UN1114	II	
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Additional information	UN	IMDG	IATA
	-	-	Passenger and Cargo Aircraft Quantity limitation: 5 L Cargo Aircraft Only Quantity limitation: 60 L Limited Quantities - Passenger Aircraft Quantity limitation: 1 L

15 . Regulatory information

Regulatory information : May cause cancer
Flammable liquid
Irritating material

References : GUIDELINES ON THE PREPARATION OF MATERIAL SAFETY DATA SHEETS (MSDS), Occupational Health Department, Ministry of Manpower, Singapore.

History

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Notice to reader

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.