

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. Hazards identification

Physical state : Liquid.
Odor : Characteristic.
Color : Colorless to light yellow.
Hazard status : This material is classified as hazardous under OSHA regulations.
Emergency overview : WARNING !
 EXTREMELY FLAMMABLE LIQUID AND VAPOR.
 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.
 VAPOR 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)

3. Composition/information on ingredients

United States

Name	CAS number	%
Benzene	71-43-2	70 - 100

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 with plenty of water for at least 20 minutes. 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 must contact Poison Control Center.
- 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 vapor. Vapor may cause flash fire. Vapors 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 spilled material.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : If emergency personnel are unavailable, contain spilled 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, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

7 . Handling and storage

- Handling** : Do not ingest. 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 grounding 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

United States

Product name

Benzene

Exposure limits

ACGIH TLV (United States, 1/2005). Skin

STEL: 8 mg/m³ 15 minute/minutes. Form: All forms.

STEL: 2.5 ppm 15 minute/minutes. Form: All forms.

TWA: 1.6 mg/m³ 8 hour/hours. Form: All forms.

TWA: 0.5 ppm 8 hour/hours. Form: All forms.

NIOSH REL (United States, 12/2001).

STEL: 1 ppm 15 minute/minutes. Form: All forms.

TWA: 0.1 ppm 10 hour/hours. Form: All forms.

OSHA PEL Z2 (United States, 6/2002).

AMP: 50 ppm 10 minute/minutes. Form: All forms.

CEIL: 25 ppm Form: All forms.

TWA: 10 ppm 8 hour/hours. Form: All forms.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, vapor 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, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes

: Safety glasses.

Skin

: Lab coat.

Respiratory

: Vapor 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. 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)

Color

: Colorless to light yellow.

Odor

: 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)
- Vapor 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 polymerization** : 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

Toxicity data

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

Ecotoxicity data

Product/ingredient name	Species	Period	Result
Benzene	Daphnia magna (EC50)	48 hour/hours	9.23 mg/l
	Daphnia magna (EC50)	48 hour/hours	10 mg/l
	Daphnia magna (EC50)	48 hour/hours	11.73 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	5.3 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	5.9 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	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 and 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 local authority requirements.

14 . Transport information

Regulatory information	Proper shipping name	Class	UN number	PG	Label
UN / IMDG / IATA Classification	BENZENE	3	UN1114	II	
DOT Classification	BENZENE	3	UN1114	II	

Additional information	UN	IMDG	IATA	DOT
	-	-	Passenger and Cargo Aircraft Quantity limitation: 5 L Cargo Aircraft Only Quantity limitation: 60 L Limited Quantities - Passenger Aircraft Quantity limitation: 1 L	Reportable quantity 10 lbs. (4.536 kg) Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: 5 L Cargo aircraft Quantity limitation: 60 L Special provisions IB2, T4, TP1

15 . Regulatory information

United States

HCS Classification : Flammable liquid
 Irritating material
 Carcinogen
 Target organ effects

U.S. Federal regulations : TSCA : All components listed.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
 SARA 302/304 emergency planning and notification: No products were found.
 SARA 302/304/311/312 hazardous chemicals: Benzene
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Benzene:
 Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: Benzene

Clean Water Act (CWA) 311: Benzene

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	: Benzene	71-43-2	70 - 100
Supplier notification	: Benzene	71-43-2	70 - 100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Benzene: (special hazard, environmental hazard, generic environmental hazard)
 Massachusetts RTK: Benzene
 New Jersey: Benzene
WARNING: This product contains chemical(s) known to the State of California to cause cancer.
WARNING: This product contains chemical(s) known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Benzene	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)

International regulations

International lists : All components listed are listed on major international inventories or exempted from being listed in Australia (AICS), Europe (EINECS/ELINCS), Korea (TCCL), Japan (METI/MOL), Philippines (RA6969).

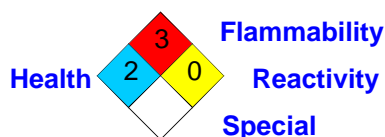
16 . Other information

Label requirements (U.S.A.) : EXTREMELY FLAMMABLE LIQUID AND VAPOR.
 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.
 VAPOR MAY CAUSE FLASH FIRE.
 MAY BE HARMFUL IF SWALLOWED.

Hazardous Material Information System (U.S.A.) :

HMIS RATING		HAZARD RATINGS
Health	* 2	4- Extreme
Fire hazard	3	3- Serious
Physical Hazard	0	2- Moderate
Personal protection	C	1- Slight
		0- Minimal

National Fire Protection Association (U.S.A.) :



References : ANSI Z400.1, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG.

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Notice to reader

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