

MATERIAL SAFETY DATA SHEET

Revision Date : 01.07.2006

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : BENZENE
Chemical name : Benzene
Product use : Chemical feedstock
UN number : 1114
MSDS Internet website : www. hitechchemicals.co.za

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No.	Weight%	Symbol Codes	R-Phrase Numbers
Benzene	71-43-2	100.00	F, T	R11, R45, R48/23/24/25

See Section 15 for European Label Information.

See Section 8 for Exposure Limits (if applicable).

3. HAZARDS IDENTIFICATION

Emergency response data : Colourless Liquid. Highly flammable. Vapour accumulation could flash and/or explode if in contact with any ignition source. DOT ERG No. : 130

Potential health effects

Inhalation : Inhalation of material could be harmful.
Skin : Irritation or more serious skin disorders.
Eye : Practically non-irritating.
Ingestion : Swallowing may result in severe gastric irritation.
Carcinogenicity : Both NTP and IARC list Benzene as a human carcinogen.
Potential environmental effects : Toxic to fish, aquatic organisms and wildlife. Do not discharge into lakes, streams, ponds and ground water supply.

See Section 11 for further health effects/toxicological data.

4. FIRST AID MEASURES

Inhalation : Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation with a mouthpiece.
Skin contact : Remove contaminated clothing. Dry wipe exposed skin and cleanse with hand cleaner, soap and water. Launder contaminated clothing before reuse. (See Section 16 - Injection Injury)
Eye contact : Flush thoroughly with water. If irritation occurs call a doctor.

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Ingestion	:	Seek immediate medical attention. Do not induce vomiting.
Note to doctors	:	Material if aspirated into the lungs may cause chemical pneumonitis. Treat appropriately.

5. FIRE-FIGHTING MEASURES

Extinguishing media	:	Carbon dioxide, foam, dry chemical and water fog.
Special fire fighting procedure	:	Stay upwind and keep out of low areas. For tank, rail car or tank truck maintain an evacuation radius of 800m. Water spray should only be used to keep fire-exposed containers cool, flush spills away from exposures, disperse vapours and protect personnel attempting to stop leak. Prevent runoff from fire control or dilution from entering streams, municipal sewers, or drinking water supply.
Special protective equipment for firefighters	:	For fires in enclosed areas, fire fighters must use Self-Contained Breathing Apparatus.
Unusual fire and explosive hazards	:	Highly flammable. Vapour accumulation could flash or explode if in contact with an open flame.
Products of decomposition	:	Fumes, smoke and carbon monoxide.
Flash Point	:	< 0 °C (ASTM D-56)
Upper Explosion Limit	:	7.9 %(V)
Lower Explosion Limit	:	1.3 %(V)
NFPA Hazard Id	:	Health: 3; Flammability: 3; Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

Procedure if material is released or spilled	:	Report spills/releases as required to appropriate authorities.
Methods for cleaning up	:	Personnel performing clean up must wear protective equipment. SMALL SPILLS: Eliminate all ignition sources. Absorb on fire-retardant treated sawdust, diatomaceous earth, etc. Shovel up with spark-resistant utensils for later disposal at an approved facility, in accordance with current laws and regulations. LARGE SPILLS: Self-contained breathing apparatus must be worn during cleanup. Eliminate all sources of ignition. Shut off source, seal the leak taking normal safety precautions. Contain material and pump back to holding tank for later disposal. Transfer equipment should be explosion-proof.
Personal precautions	:	See Section 8.
Environmental precautions	:	Prevent spill from entering municipal sewers, water sources or low lying areas. Advise the relevant authorities if contaminations have occurred.

7. HANDLING AND STORAGE

Safe handling advice	:	Exercise extreme care when handling this product. Use in a well ventilated area away from all ignition sources. Avoid sparking conditions. Ground and bond all transfer equipment.
Storage information	:	Store and handle in accordance with required regulations (eg. OSHA 29 CFR 1910.106). Should not be stored with incompatible substances. This product is a static accumulator, therefore, all storage containers should be grounded and bonded. Drums should also be equipped with self-closing valves, pressure vacuum bungs and flame arresters. Store away from all ignition sources in a cool, well ventilated area. Outside or detached storage area, with an automatic sprinkling system, is preferred.
Storage and handling procedures	:	Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits (OELs)

Components	CAS-No.	Source	TWA	Value		Notations
Benzene	71-43-2	ACGIH(TLV)	LTEL	1.6 mg/m ³	0.5 ppm	Skin; A1; BEI
			STEL	8 mg/m ³	2.5 ppm	
		OSHA(PEL)	LTEL	2 mg/m ³	1 ppm	
			STEL	16 mg/m ³	5 ppm	

LTEL: Long Term Exposure Limits - Time Weight Average (TWA) over 8 hours.

STEL: Short Term Exposure Limits - Time Weight Average (TWA) over 15 Minutes

Note: Limits Shown for guidance only. Follow applicable regulations.

Personal Protection Equipment (PPE)

- Engineering controls : Use in well ventilated area. Explosive-proof ventilation equipment with local exhaust is desirable.
- Respiratory protection : Approved respiratory equipment must be used when mist concentrations exceed the recommended exposure limits.
- Eye protection : Chemical type goggles with a face shield must be worn.
- Skin and body protection : Impervious gloves must be worn. If body contact is likely, appropriate personal protective equipment must be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Liquid.
- Colour : Colourless
- Odour : Aromatic
- Solubility : Negligible
- Boiling point/range : 80 °C
- Flash Point : < 0 °C (ASTM D-56)
- Vapour pressure : 80 hPa
- Density : 0.8800 g/cm³ @ 20 °C (ASTM D-
- Viscosity, kinematic : 1.1 mm²/s @ 40 °C (ASTM D-445)

10. STABILITY AND REACTIVITY

- Stability : Stable.
- Conditions to avoid : Heat, sparks, flame and build up of static electricity.
- Materials to avoid : Halogens, strong acids, alkalis and oxidizers.
- Hazardous decomposition products : Fumes, smoke and carbon monoxide.

11. TOXICOLOGICAL INFORMATION

- Acute oral toxicity : (Rats): Practically non-toxic (LD50: > 2 000 mg/kg). Based on single dose level testing at 2 000 mg/kg.
- Acute inhalation toxicity : (Rats): Practically non-toxic (LC50: greater than 5 mg/l for 4 hours).
- Acute dermal toxicity : (Rabbits): Practically non-toxic (LD50: greater than 2000 mg/kg). Based on single dose testing at 2 000mg/kg.
- Skin irritation : (Rabbits): Practically non-irritating.
- Eye irritation : (Rabbits): Practically non-irritating.
- Repeated dose toxicity : Prolonged repeated skin contact with low viscosity materials may defat

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the skin resulting in possible irritation and dermatitis. Animal studies with benzene by inhalation or by oral administration have resulted in evidence of carcinogenic effects. Both NTP and IARC list benzene as a human carcinogen. Long-term exposure to benzene at < 100 ppm has been reported to result in blood abnormalities in humans, including anaemia and, in rare cases, leukemia, and may develop without warning symptoms.

- Toxicity to reproduction : High levels of benzene may cause reproductive and developmental effects in laboratory animals. While it does not cause malformations it may be toxic to the foetus. Therefore, precautionary measures should be taken to avoid excessive exposure during pregnancy.
- Genetic (in vitro) : Benzene exposure can cause chromosomal aberrations in animals, humans and in vitro assays.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

- Biodegradability : Not established.
- Physico-chemical removability : Water solubility: 1 800 mg/l @ 25 C.

Ecotoxicity effects

- Toxicity to fish : (Rainbow trout) LC/EC50: 9.2 mg/l at 96 hours.
- Toxicity to aquatic organisms : (Daphnia) LC/EC50 (Immobilisation): 10 mg/l at 48 hours

Further information on ecology

13. DISPOSAL CONSIDERATIONS

- Waste disposal : Dispose of waste at an appropriate disposal facility in accordance with current applicable laws and regulations.
- Contaminated packaging : Empty containers retain residue (liquid and/or vapour) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.
- Other regulations : Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). BENZENE: 100 PCT (TCLP)
- Flash Point : < 0 °C (ASTM D-56)

14. TRANSPORT INFORMATION

ADR

- Proper shipping name : BENZENE
- UN number : 1114
- Class : 3
- Letter : F
- Packing group : II

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Labelling number : 3
Product Reportable Quantity : 4.5 kg

CFR

Proper shipping name : BENZENE
UN number : 1114
Class : 3
Letter : F
Packing group : II
Labelling number : 3
Product Reportable Quantity :

IATA_C

Proper shipping name : BENZENE
UN number : 1114
Class : 3
Letter : F
Packing group : II
Labelling number : 3
Product Reportable Quantity :

IMDG

Proper shipping name : BENZENE
UN number : 1114
Class : 3
Letter : F
Packing group : II
Labelling number : 3
Product Reportable Quantity :
Marine pollutant : Severe marine pollutant
Medical First Aid Guide : 312
(MFAG) table
Emergency Schedule (EmS) : 3-03
number
IMDG code page number : 3185

15. REGULATORY INFORMATION

US OSHA Hazard : Product assessed in accordance with OSHA 29 CFR 1910.1200 and
Communication Standard : determined to be hazardous.

Governmental Inventory : All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL,
Status : KECI, ENCS, PICCS and IECSC.

EU Labelling : Product is dangerous as defined by the European Union Dangerous
Substances/Preparations Directives.

Symbols : F, T
Highly flammable, Toxic

R-Phrase(s) : R45, R11, R48/23/24/25
May cause cancer., Highly flammable., Toxic: danger of serious damage
to health by prolonged exposure through inhalation, in contact with skin
and if swallowed.

S-phrase(s) : S53, S45
Avoid exposure - obtain special instructions before use., In case of
accident or if you feel unwell, seek medical advice immediately (show the
label where possible).

Note : Contains Benzene.

SARA

U.S. Superfund : This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
Amendments and
Reauthorization Act SARA
Title III

SARA (311/312) Reportable : Fire Chronic

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Hazard Categories

SARA (313) Toxic Release : Benzene (71-43-2) - Conc > 99%
Chemicals:

The following product ingredients are cited on the lists below

Chemical name	CAS-No.	Concentration [%]	List Citations
Benzene	71-43-2	100.00	1, 2, 4, 6, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

Regulatory List Searched

1 = ACGIH ALL	6 = IARC 1	11 = TSCA 4	17 = CA P65	22 = MI 293
2 = ACGIH A1	7 = IARC 2A	12 = TSCA 5a2	18 = CA RTK	23 = MN RTK
3 = ACGIH A2	8 = IARC 2B	13 = TSCA 5e	19 = FL RTK	24 = NJ RTK
4 = NTP CARC	9 = OSHA CARC	14 = TSCA 6	20 = IL RTK	25 = PA RTK
5 = NTP SUS	10 = OSHA Z	15 = TSCA 12b	21 = LA RTK	26 = RI RTK

Code Key: CARC = Carcinogen; SUS = Suspected Carcinogen

16. OTHER INFORMATION

Note: Our products do not contain PCBs.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for any other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a doctor as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS BENZENE

WARNING!

FLAMMABLE LIQUID AND VAPOUR. RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

OVEREXPOSURE TO BENZENE MAY RESULT IN CANCER, BLOOD DISORDERS, AND DAMAGE TO THE BONE MARROW.

SAFETY: Keep away from heat and flame. Do not get on skin or clothing. Wear impervious gloves and clothing. Avoid breathing mist or vapour. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: If swallowed, call a doctor immediately. Only induce vomiting at the instruction of a doctor. Never induce vomiting or give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a doctor immediately. In case of contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Call a doctor if symptoms occur. Wash clothing before reuse.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

Disclaimer

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing

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is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.
