

**MATERIAL SAFETY DATA SHEET (MSDS)****BENZENE****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

SUBSTANCE OR PREPARATION TRADE NAME	Benzene
CHEMICAL CLASSIFICATION	Hydrocarbon (aromatic)
COMPANY/ UNDERTAKING NAME AND ADDRESS	Haldia Petrochemicals Limited, PO Box No 12, Haldia Plant PO Durgachak, Dist Midnapore West Bengal, India PIN 721 602
TELEPHONE	091-3224-274384 / 274400
EMERGENCY TELEPHONE NUMBER	091-3224-275916

2. COMPOSITION AND INFORMATION ON INGREDIENTS

CHEMICAL NAME	CHEMICAL FORMULA	CONTENT	CAS NUMBER	EXPOSURE LIMITS IN AIR		
				ACGIH TLV-TWA	ACGIH TLV-STEL	CEILIN G
Benzene	C ₆ H ₆	99.9 min wt%	71-43-2	0.5 (ppm)	2.5 (ppm)	25(ppm)
Total non aromatics including methyl cyclo hexane		300 max (ppmw)	Mixture	NA	NA	NA
Toluene + methyl cyclo hexane	C ₇ H ₈ +C ₇ H ₁₄	200 max (ppmw)	Mixture			
Acid wash color		1 max (ppmw)				
Thiophene	C ₄ H ₄ S	1 max (ppmw)	110-02-1			
Total Sulphur	S	1 max (ppmw)	7704-34-9			

3. HAZARD CLASSIFICATION

EMERGENCY OVERVIEW	TOXIC, FLAMMABLE, CANCER HAZARD product is a clear liquid at room temperature with a sweet, solvent-like odour. Flammable liquid and vapour can accumulate static charge-distant ignition and flash back are possible. Product will float on water and may travel to distant locations and or spread fire; product vapour is heavier than air and may also spread long distances				
POTENTIAL HEALTH HAZARDS					
	EYE	SKIN	INHALATION	INGESTION	OTHERS
ACUTE	Contact with liquid and high concentrations of this product vapour are irritating to	Product may be rapidly absorbed through the skin. Prolonged and or repeated skin contact may cause mild to severe	Excessive inhalation may result in heartbeat irregularities and adverse central nervous	Harmful if swallowed. Ingestion of this product may result in adverse central nervous system effects including	
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	the eyes	irritation/dermatitis and chemical blistering, skin sensitisation and secondary skin infections	system effects including headache, sleepiness, dizziness, nausea, and in extreme conditions, coma and death.	headache, sleepiness, dizziness, nausea, loss of coordination, and in extreme conditions coma and or death. Ingestion may also cause kidney and liver damage and blood disorders.	
CHRONIC	Bone marrow is the main target organ of benzene				
NFPA HAZARD SIGNALS	HEALTH 2	FLAMMABILITY 3	REACTIVITY 0	SPECIAL	
HAZCHEMCODE	3WE				

4. FIRST AID MEASURES

SKIN CONTACT	Remove contaminated clothing and immediately wash skin with large amounts of warm water and an oil emulsifying soap or shampoo
EYE CONTACT	Immediately flush eyes with lukewarm water for at least 15 minutes, while holding eyelids open. Remove contact lenses, if worn.
INHALATION	Move to a well-ventilated area as soon as possible. Loosen any restrictive clothing such as a collar, tie, and belt.
INGESTION	If ingestion occurs and exposed individual is unconscious, maintain an open airway by gently lifting chin and tilting head back. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Seek medical attention immediately.
OTHER INSTRUCTIONS	Avoid mouth-to-mouth contact by using a mouth shield to perform artificial respiration. Person who is inhaling of this product.

5. FIRE FIGHTING MEASURES

FLASH POINT	-11.1 °C (Closed cup)
AUTO IGNITION TEMP	498 °C
FLAMMABLE LIMITS IN AIR BY VOL%	LEL%: 1.2, UEL%: 7.8
FIRE EXTINGUISHING AGENTS AND SPECIAL PROCEDURES	Dry chemical, foam, carbon dioxide, and water fog
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapour may form explosive mixture with air, container may explode when involved in a fire
SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS	Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	Isolate area. Keep unnecessary personnel away. Alert stand-by emergency and fire fighting personnel. Do not touch spilled material
ENVIRONMENTAL PRECAUTIONS	Restrict access to area until completion of cleanup. Notify government occupational and environmental authorities. Prevent material from entering sewers or confined space. Contain spill with earth, sand or absorbent material which does not react with spilled material

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CLEAN UP	Soak up spill with absorbent material, which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product.
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7. HANDLING AND STORAGE

HANDLING	Handle in fully grounded, properly designed equipment systems suitable for flammable liquids. Collect and flare vents. Keep away from heat, ignition sources and incompatible materials such as oxidising agents and acids. Dissipate static electricity during transfer by grounding and bonding containers and equipment. Take special precautions when cold cutting or breakage into lines, or when cleaning and disposal of empty containers.
STORAGE	Storage area should be clearly identified, well illuminated, clear of obstruction and accessible only to trainees and authorized personnel. Store in grounded, properly designed vessel and away from incompatible materials. Store and use away from heat, sparks, open flame or any other ignition source. Equipment storage vents with flame arrestor. Storage tank should be above ground level and diked to hold entire contents.

8. EXPOSURE CONTROLS-PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROL	Provide local and general exhaust ventilation to effectively remove and prevent build-up of any vapours or mists generated from the handling of this product.		
OTHER CONTROL PARAMETERS	Ensure that eye wash stations and safety showers are proximal to the workstation location.		
PERSONAL PROTECTION EQUIPMENT			
EYE/ FACE PROTECTION	RESPIRATORY PROTECTION	HAND PROTECTION	BODY PROTECTION
Wear safety glasses wear chemical goggles	Organic vapour cartridge respirators or SCBA	Chemically resistant gloves and footwear with good traction to avoid slipping.	Impervious over coat. Fire resistant or natural fiber clothing is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	ODOUR	PHYSICAL STATE	BOILING POINT
Colourless	Characteristic	Liquid	80.1 ⁰ C
MELTING / FREEZING POINT	SPECIFIC GRAVITY (AT20 ⁰ C) (WATER=1)	PH	SOLUBILITY IN WATER (AT 30 ⁰ C)
5.5 ⁰ C	0.88	NA	Insoluble
VAPOUR PRESSURE (AT 20 ⁰ C) IN MM Hg	VAPOUR DENSITY (AIR=1)	OTHER INFORMATIONS	VISCOSITY
100	2.77		NA

10. STABILITY AND REACTIVITY

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CONDITIONS TO AVOID	Keep away from heat, sparks, or open flame
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE	Reactive with oxidizing agents, acids and halogens. May attack and degrade some type of plastics, rubbers and coatings
HAZARDOUS DECOMPOSITION PRODUCTS	Carbon monoxide, carbon dioxide and or low molecular weight hydrocarbons
HAZARDOUS POLYMERIZATION	Not likely to occur

11. TOXICOLOGICAL INFORMATION

ANIMAL TOXICITY DATA	
ORAL: LD50 IN (rat) mg/kg 930	DERMAL: LD50 (rabbit) μ L/kg 9400
IRRITANCY OF PRODUCT	Mild Skin and eye irritation
REPRODUCTIVE TOXICITY INFORMATION	
REPRODUCTIVE TOXICITY	Benzene does not appear to cause reproductive toxicity.
MUTAGENICITY	Benzene has been extensively examined in mutagen city studies with rats and mice with positive results in virtually all tests reported.
EMBRYOTOXICITY/ TERATOGENICITY	Results show that benzene is not teratogenic or embryo toxic even at levels that caused maternal toxicity. Fatal toxicity was observed at exposures above 50ppm
CARCINOGENICITY	Benzene is known to be carcinogenic in humans. The international agency for research on cancer (IARC) has concluded that there is sufficient evidence for carcinogenicity of benzene in animals.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY	When released to soil or water, product will rapidly begin to volatilize, benzene migrates in soils and ground waters
EFFECT OF MATERIAL ON PLANTS OR ANIMALS	
EFFECT OF CHEMICAL ON AQUATIC LIFE	Metabolites may be detected in fatty tissues of aquatic organism.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Do not attempt to dispose of by uncontrolled ignition. Disposal of this product as per federal, provincial/state and local authorities
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14. TRANSPORT INFORMATION

	PROPER SHIPPING NAME	HAZARD CLASS	IDENTIFICATION NUMBER	PACKING GROUP	LABEL REQUIRED
DOT	Benzene	3	UN1114	II	Flammable liquid
TDG	Benzene	3	UN1114	II	Flammable
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					liquid
IMDG/IA CO	Benzene	3	UN1114	II	Flammable liquid

15. REGULATORY INFORMATION

INDIAN REGULATION		Manufacture Import & Storage of hazardous chemical rules. Amended as on 2000
INTERNATIONAL REGULATIONS		
EU CLASSIFICATION		Highly flammable. Carcinogenic, category 1.toxic
	RISK PHRASES	May Cause Cancer. Highly Flammable. Also Toxic. [R: 45-11-48/23/24/25]
	SAFETY PHRASES	Avoid exposure-obtain special instruction before use
WHMIS CLASSIFICATION		B2- flammable and combustible material D2A-poisonous and infectious material –other effects-very toxic D2B-poisonous and infectious material-other effects-toxic
OSHA CLASSIFICATION		Meets criteria of hazardous material, as defined by 29CFR 1910.1200.

16. OTHER INFORMATION

DISCLAIMER	Information contained in this material safety data sheet is believed to be reliable but no representation, guarantee or warranties of any kind are made as to its accuracy, suitability for a particular application or results to be obtained from them. It is upto the user/ distributor to ensure that the information contained in the material safety data sheet is relevant to the product manufactured/ handled or sold by him as the case may be. HPL makes no warranties, expressed or implied, in respect of the adequacy of this document for any particular purpose.
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