Material Safety Data Sheets

Revision 2

1. IDENTIFICATION

Product Name	**Benzene**
Other Names	**Aromatic Benzene ,Benzol ,Cyclohexatriene ,Phene ,Phenyl Hydride**
Code No	**100-BE-2**
Uses	**No Data Available**
Chemical Family	**No Data Available**
Chemical Formula	C_6H_6
Chemical Name	**Benzene**
Product Description	**No Data Available**
Contact Information	
Company	**Arman sina.co**
Contact Information	**info@armansina.com** **www.armansina.com**

2. HAZARD IDENTIFICATION

Hazard Categories	**Highly flammable liquid and vapor.** **Toxic**
Risk Phrases	**May be fatal if swallowed and enters airways.** **Causes skin irritation.** **Causes serious eye irritation.** **May cause genetic defects.** **May cause cancer.** **Causes damage to organs (Blood) through prolonged or repeated exposure.**
Safety Phrases	**Do not handle until all safety precautions have been read and understood.** **No smoking.** **Keep container tightly closed.** **Ground/bond container and receiving equipment.** **Use explosion-proof electrical/ ventilating/ lighting/**

Symbol

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Benzene	C_6H_6	71-43-2	100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

General advice	Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.
If inhaled	If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, remove containers from the path of fire.
Flammability Conditions	Product is a flammable liquid.
Suitable extinguishing media	Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media	High volume water jet.
Specific hazards during fire fighting	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers
Fire and explosion protection	Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Flash Point	-11 ° C (12 ° F) Method: Tag closed cup
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	498 ° C (928 ° F)

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	**Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.**
Environmental precautions	**Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.**
Methods for cleaning up	**Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations .**

7. HANDLING AND STORAGE

handling	**Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.** **Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. Review all operations, which have the potential to generating and accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106 "Flammable and Combustible Liquids"; National Fire Protection Association (NFPA 77), "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and stray Currents".** **Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes.** **Smoking, eating and drinking should be prohibited in the application area.** **Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood.** **Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.**
Storage and containers	**No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.** **Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.**
Advice on protection against fire and explosion	**Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.**
Lower explosion limit	**1.2 %(V)**
Upper explosion limit	**7.8 %(V)**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures	Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.
Respiratory protection	Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.
Hygiene measures	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

Physical state	Liquid
Color	Clear, Colorless
Odor	sweet, distinct
Molecular formula	C6H6
Molecular weight	78.12 g/mol
pH	Not applicable
Pour point	No data available
Boiling point/boiling range	80 ° C (176 ° F)
Vapor pressure	75.00 MMHG at 20 ° C (68 ° F)
Relative density	0.88 at 25 ° C (77 ° F)
Water solubility	1.88 g/l at 23.5 ° C (74.3 ° F)
Partition coefficient: n-	log Pow: 2.13

octanol/water	
Relative vapor density	2.77 (Air = 1.0)
Evaporation rate	2.8
Percent volatile	> 99 %
Conductivity	< 50 pSm at 20 ° C

10. STABILITY AND REACTIVITY

Reactivity	No decomposition if stored and applied as directed.
Chemical stability	This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. No decomposition if stored and applied as directed.

Possibility of hazardous reactions

Conditions to avoid	Heat, flames and sparks.
Materials to avoid	May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products	No data available
Other data	No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD50: > 2,000 mg/kg Species: Rat Sex: female
Acute inhalation toxicity	LC50: 44.5 mg/l Exposure time: 4 h Species: Rat Sex: Not Specified Test atmosphere: vapor
Acute dermal toxicity	LD50: > 8,260 mg/kg Species: Rabbit
Skin irritation	May cause skin irritation in susceptible persons.
Eye irritation	May cause irreversible eye damage.
	Did not cause sensitization on laboratory animals.

Repeated dose toxicity	**Species: Rat, female** **Sex: female** **Application Route: oral gavage** **Dose: 0, 25, 50, 100 mg/kg** **Exposure time: 103 wk** **Number of exposures: 5 d/wk** **NOEL: < 25 mg/kg** **Lowest observable effect level: 25 mg/kg** **Species: Rat, male** **Sex: male** **Application Route: oral gavage** **Dose: 0, 50, 100, 200 mg/kg** **Exposure time: 103 wk** **Number of exposures: 5 d/wk** **NOEL: < 50 mg/kg** **Lowest observable effect level: 50 mg/kg** **Species: Mouse** **Application Route: oral gavage** **Dose: 0, 25, 50,100 mg/kg** **Exposure time: 103 wk** **NOEL: < 25 mg/kg**
Carcinogenicity	**Species: Rat** **Sex: female** **Dose: 0, 25, 50, 250 mg/kg** **Exposure time: 103 wks** **Number of exposures: daily, 5 days/week** **Test substance: yes** **Remarks: zymbal gland carcinomas, squamous cell papillomas** **Species: Rat** **Sex: male** **Dose: 0, 50, 100, 200 mg/kg** **Exposure time: 103 wks** **Number of exposures: daily, 5 days/week** **Test substance: yes** **Remarks: zymbal gland carcinomas, squamous cell papillomas** **Species: Mouse** **Sex: male and female** **Dose: 25, 50, 100 mg/kg** **Exposure time: 103 wks** **Number of exposures: daily, 5 days/week** **Test substance: yes** **Remarks: Clear evidence of multiple organ carcinogenicity.**
Aspiration toxicity	**May be fatal if swallowed and enters airways.** **Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.**
CMR effects	**Carcinogenicity: Human carcinogen.** **Mutagenicity: In vivo tests showed mutagenic effects** **Teratogenicity: Did not show teratogenic effects in animal experiments.** **Reproductive toxicity: Animal testing did not show any effects on fertility.**
Further information	**Chronic Health Hazard.** **Solvents may degrease the skin.**

12. ECOLOGICAL INFORMATION

Toxicity to fish	**LC50: 5.3 mg/l** **Exposure time: 96 h** **Species: Oncorhynchus mykiss (rainbow trout)** **flow-through test Test substance: yes** **Method: OECD Test Guideline 203**
Toxicity to daphnia and other aquatic invertebrates	**EC50: 10 mg/l** **Exposure time: 48 h** **Species: Daphnia magna (Water flea)** **static test Test substance: yes** **Method: OECD Test Guideline 202**
Toxicity to algae	**ErC50: 100 mg/l** **Exposure time: 72 h** **Species: Pseudokirchneriella subcapitata (green algae)** **Test substance: yes** **Method: OECD Test Guideline 201**
Biodegradability	**This material is expected to be readily biodegradable.**
Acute aquatic toxicity	**Toxic to aquatic life.**
Chronic aquatic toxicity	**Harmful to aquatic life with long lasting effects.**
Results of PBT assessment	**This substance is not considered to be persistent, bioaccumulating and toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).**
Additional ecological information	**Toxic to aquatic life.** **An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life.**

13. DISPOSAL CONSIDERATIONS

General Information	**Dispose of in accordance with all local regulations. All empty packaging should be disposed of in accordance with Local Regulations or recycled/reconditioned at an approved facility. Handle contaminated packaging in the same way as the substance if self. Empty containers should be recycled or disposed of through an approved waste management facility.**
Special Precautions for Land Fill	**Contact a specialist disposal company or the local waste regulator for advice.**

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	BENZENE
Subsidiary Risk(s)	No Data Available
ERG	RQ (BENZENE)
UN Number	1114
Hazchem	3
Pack Group	II
Special Provision	No Data Available

Sea Transport

Proper Shipping Name	BENZENE
UN Number	1114
Hazchem	2P
Pack Group	II
Special Provision	No Data Available
EMS	FE,SC
Marine Pollutant	No

Air Transport

Proper Shipping Name	BENZENE
UN Number	1114
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

15. OTHER INFORMATION

Revision	2
Key/Legend	< Less Than > Greater Than atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm Square Centimetres CO2 Carbon Dioxide COD Chemical Oxygen Demand Degrees Celsius Degrees Fahrenheit g Grams g/cm Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluable in each other. inHg Inch of Mercury inH2O Inch of Water K Kelvin kg Kilogram kg/m Kilograms per Cubic Metre lb Pound LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. ltr or L Litre m Cubic Metre mbar Millibar mg Milligram

mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m Milligrams per Cubic Metre
Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight