
1. PRODUCT AND COMPANY IDENTIFICATION

Product name	Benzene
Synonyms	
Grade	ACS, HPLC, Anapremium
Company	Anaqua Chemicals Supply 1510 Eldridge Parkway, Suite 110-268 Houston, TX 77077, USA
Telephone	(281) 668-0032
Fax	(281) 668-0033

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Formula	C ₆ H ₆
CAS-No.	71-43-2
Index-No.	601-020-00-8
Ec-No.	200-753-7
Concentration	≥ 99 %

3. HAZARDS IDENTIFICATION**GHS Classification**

Flammable liquids	Category 2
Carcinogenicity	Category 1A
Germ cell mutagenicity	Category 1B
Aspiration hazard	Category 1
Skin irritation	Category 2
Specific target organ toxicity – repeated exposure	Category 1
Eye irritation	Category 2

According to European Directive 67/548/EEC as amended.

Highly flammable. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. May cause cancer. May cause heritable genetic damage. Harmful: may cause lung damage if swallowed. Irritating to eyes and skin.

4. FIRST AID MEASURES

Inhalation	If breathed in, move to fresh air. If not breathing, give artificial respiration. Consult a physician.
Ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician immediately.
Skin Contact	Immediately wash off with soap and plenty of water. Consult a physician.
Eye Contact	Rinse thoroughly with plenty of water for at least 15 minutes. Consult a physician.

Most important symptoms and effects, both acute and delayed

Nausea, Dizziness, Headache, narcosis, Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation and/or giddiness, depression, drowsiness, or fatigue. The victim may experience tightness in the chest, breathlessness, and loss of consciousness. Tremors, convulsions, and death due to respiratory paralysis or circulatory collapse can occur in a few minutes to several hours following severe exposures. Aspiration of small amounts of liquid immediately causes pulmonary edema and hemorrhage of pulmonary tissue. Direct skin contact may cause erythema. Repeated or prolonged skin contact may result in drying, scaling dermatitis, or development of secondary skin infections. The chief target organ is the hematopoietic system. Bleeding from the nose, gums, or mucous membranes and the development of purpuric spots, pancytopenia, leukopenia, thrombocytopenia, aplastic anemia, and leukemia may occur as the condition progresses. The bone marrow may appear normal, aplastic or hyperplastic, and may not correlate with peripheral blood forming tissues. The onset of effects of prolonged benzene exposure may be delayed for many months or years after the actual exposure has ceased, blood disorders.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for fire-fighters	Wear self contained breathing apparatus for fighting fire if necessary. Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Methods and materials for containment and cleaning up	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

7. HANDLING AND STORAGE

Handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build-up of electrostatic charge.
Storage	Store in cool place. 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.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Personal protective Equipment

Respiratory protection	Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Skin protection	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
Eye protection	Face shield and safety glasses which had already been tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Body protection	Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid, clear
Color	Colorless
pH	No available information
Melting point	5.5 °C (41.9 °F)
Boiling point	80 °C (176 °F)
Flash point	-11.0 °C (12.2 °F) - closed cup
Autoignition temperature	562 °C
Lower explosion limit	1.3 % (V)
Upper explosion limit	8 % (V)
Vapor pressure	99.5 hPa at 20.0 °C (68.0 °F) 221.3 hPa at 37.7 °C (99.86 °F)
Density	0.874 g/ cm ³ at 25 °C (77 °F)
Water solubility	No available information
Partition coefficient: n-octanol/ water	No available information
Molecular weight	78.11
Decomposition temperature	No available information
Viscosity	No available information
Explosive properties	No available information
Oxidizing properties	No available information

10. STABILITY AND REACTIVITY

Storage stability	No available information
Conditions to avoid	Heat, flames and sparks. Extremes of temperature and direct sunlight.
Materials to avoid	acids, Bases, Halogens, Strong oxidizing agents, Metallic salts
Hazardous decomposition products	No available information

11. TOXICOLOGICAL INFORMATION

Acute toxicity	LD50 Oral 2,990 mg/kg (rat) LC50 Inhalation 44,700 mg/m ³ (rat (female)) 4 h LD50 Dermal 8,263 mg/kg (rabbit)
Skin irritation	Skin irritation (rabbit)
Eye irritation	Eye irritation (rabbit)
Sensitization	No available information
Germ cell mutagenicity	Laboratory experiments have shown mutagenic effects. In vivo tests showed mutagenic effects Genotoxicity in vitro - Human – lymphocyte Sister chromatid exchange Genotoxicity in vitro - mouse – lymphocyte Mutation in mammalian somatic cells. Genotoxicity in vivo - mouse - Inhalation Sister chromatid exchange
Specific target organ toxicity – single exposure (GHS)	No available information
Specific target organ toxicity – repeated exposure (GHS)	No available information
Carcinogenicity	Carcinogenicity - Human - male - Inhalation Tumorigenic: Carcinogenic by RTECS criteria. Leukaemia Blood: Thrombocytopenia. Carcinogenicity - rat - Oral Tumorigenic: Carcinogenic by RTECS criteria. Endocrine: Tumors. Leukaemia This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Human carcinogen. IARC: 1 - Group 1: Carcinogenic to humans (Benzene)
Reproductive toxicity	Reproductive toxicity - mouse - Intraperitoneal Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetal death. Developmental Toxicity - rat - Inhalation Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Developmental Toxicity - mouse - Inhalation Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Specific

Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Aspiration hazard	May be fatal if swallowed and enters airways.
Potential health effects	Inhalation Harmful if inhaled. May cause respiratory tract irritation. Vapours may cause drowsiness and dizziness. Ingestion Harmful if swallowed. Aspiration hazard if swallowed - can enter lungs and cause damage. Skin Harmful if absorbed through skin. May cause skin irritation. Eyes Causes eye irritation.
Signs and Symptoms of Exposure	Nausea, Dizziness, Headache, narcosis, Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation and/or giddiness, depression, drowsiness, or fatigue. The victim may experience tightness in the chest, breathlessness, and loss of consciousness. Tremors, convulsions, and death due to respiratory paralysis or circulatory collapse can occur in a few minutes to several hours following severe exposures. Aspiration of small amounts of liquid immediately causes pulmonary edema and hemorrhage of pulmonary tissue. Direct skin contact may cause erythema. Repeated or prolonged skin contact may result in drying, scaling dermatitis, or development of secondary skin infections. The chief target organ is the hematopoietic system. Bleeding from the nose, gums, or mucous membranes and the development of purpuric spots, pancytopenia, leukopenia, thrombocytopenia, aplastic anemia, and leukemia may occur as the condition progresses. The bone marrow may appear normal, aplastic or hyperplastic, and may not correlate with peripheral bloodforming tissues. The onset of effects of prolonged benzene exposure may be delayed for many months or years after the actual exposure has ceased., Blood disorders
Additional Information	RTECS: CY1400000

12. ECOLOGICAL INFORMATION

Ecotoxicity	
Persistence and degradability	No available information
Toxicity to fish	LC50 5.90 mg/l (Oncorhynchus mykiss (rainbow trout)) 96 h LC50 15.00 – 32.00 mg/l (Pimephales promelas (fathead minnow)) 96 h LC50 230.00 mg/l (Lepomis macrochirus (Bluegill)) 96 h NOEC 10.2 mg/l (Pimephales promelas (fathead minnow)) 7 d LOEC 17.2 mg/l (Pimephales promelas (fathead minnow)) 7 d
Toxicity to daphnia and other aquatic invertebrates	EC50 22.00 mg/l (Daphnia magna (Water flea)) 48 h EC50 9.20 mg/l (Daphnia magna (Water flea)) 48 h
Toxicity to algae	EC50 29.00 mg/l (Pseudokirchneriella subcapitata (green algae)) 72 h
Bioaccumulative potential	Leuciscus idus (Golden orfe) – 3 d – 0.05 mg/l Bioconcentration factor (BCF): 10
Results of PBT and vPvB assessment	No available information
Mobility	No available information
Other adverse effects	Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging Dispose of as unused product.

14. TRANSPORT INFORMATION

IATA

UN-Number: 1114 Class: 3 Packing group: II

Proper shipping name: Benzene

IMDG

UN-Number: 1114 Class: 3 Packing group: II

Proper shipping name: Benzene

EMS-No. F-E, S-D

DOT (US)

UN-Number: 1114 Class: 3 Packing group: II

Proper shipping name: Benzene

Marine pollution: No

15. REGULATORY INFORMATION

Hazard statements

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H319: Causes serious eye irritation.

H340: May cause genetic defects.

H350: May cause cancer.

H372: Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

P201: Obtain special instructions before use.

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P301 + P310: Immediately call a POISON CENTER or doctor/physician IF SWALLOWED.

P305 + P351 + P338: Rinse cautiously with water for several minutes IF IN EYES. Remove contact lenses, if present. Continue rinsing.

P308 + P313: Get medical advice/ attention IF exposed or concerned.

P331: Do NOT induce vomiting.

GHS-Labeling

Pictogram



Signal word *Danger*

Labeling according to EC Directive

Symbol(s): F: Highly flammable Xn: Harmful

R-phrases: 45-46-48/23/24/25-65-11-36/38

May cause cancer. May cause heritable genetic damage. Also toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Also harmful: may cause lung damage if swallowed. Highly flammable. Irritating to eyes and skin.

S-phrases: 53-45

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). Restricted to professional users.

16. OTHER INFORMATION

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