



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 10/01/2014

Version 1.2

SECTION 1. Identification

Product identifier

Product number	BX0220
Product name	Benzene GR ACS
CAS-No.	71-43-2

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Reagent for analysis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 2, H225
Acute toxicity, Category 4, Oral, H302
Skin irritation, Category 2, H315
Eye irritation, Category 2A, H319
Germ cell mutagenicity, Category 1B, H340
Carcinogenicity, Category 1A, H350
Specific target organ systemic toxicity - repeated exposure, Category 1, Blood, H372
Aspiration hazard, Category 1, H304

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word
Danger

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Hazard Statements

H340 May cause genetic defects.
H350 May cause cancer.
H225 Highly flammable liquid and vapor.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H372 Causes damage to organs (Blood) through prolonged or repeated exposure.

Precautionary Statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P321 Specific treatment (see supplemental first aid instructions on this label).
P330 Rinse mouth.
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	C ₆ H ₆ (Hill)
Molar mass	78.11 g/mol

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Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

benzene (>= 90 % - <= 100 %)

71-43-2

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

General advice

First aider needs to protect himself.

Inhalation

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

Skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

Eye contact

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Call a physician immediately. Pulmonary failure possible after aspiration of vomit.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, respiratory arrest, Dizziness, narcosis, inebriation, euphoria, agitation, Nausea, Headache, Tiredness, CNS disorders

Drying-out effect resulting in rough and chapped skin.

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Foam, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible.

Forms explosive mixtures with air at ambient temperatures.

Vapors are heavier than air and may spread along floors.

Pay attention to flashback.

Development of hazardous combustion gases or vapors possible in the event of fire.

Advice for firefighters

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Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Store at room temperature.

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SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>benzene 71-43-2</i>			
ACGIH	Time Weighted Average (TWA):	0.5 ppm	Can be absorbed through the skin.
	Short Term Exposure Limit (STEL):	2.5 ppm	
	Skin designation:		
NIOSH/GUIDE	Recommended exposure limit (REL):	0.1 ppm	
	Short Term Exposure Limit (STEL):	1 ppm	
Z1A	Time Weighted Average (TWA):	1 ppm	
	Short Term Exposure Limit (STEL):	5 ppm	
OSHA/Z2	Time Weighted Average (TWA):	10 ppm	
	Ceiling Limit Value:	25 ppm	
	Maximum concentration:	50 ppm	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	0.5 - 277.1 ppm
pH	No information available.
Melting point	5.5 °C
Boiling point/boiling range	176.2 °F (80.1 °C) at 1,013 hPa
Flash point	12 °F (-11 °C) Method: DIN 51755 Part 1
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.4 %(V)
Upper explosion limit	8.0 %(V)
Vapor pressure	101 hPa at 68 °F (20 °C)
Relative vapor density	2.7
Density	0.88 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	1.8 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 2.13 (experimental) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.

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Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	1031 °F (555 °C) Method: DIN 51794
Viscosity, kinematic	0.78 mm ² /s at 68 °F (20 °C)

SECTION 10. Stability and reactivity

Reactivity

steam-volatile
Vapors may form explosive mixture with air.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions

Exothermic reaction with:

halogens, uranium hexafluoride

Halogenated hydrocarbon, in the presence of:

Light metals

Risk of explosion with:

perchlorates, Nitric acid, Ozone, peroxi compounds

Risk of ignition or formation of inflammable gases or vapors with:

Oxygen, halogen-halogen compounds, oxyhalogenic compounds, chromium(VI) oxide

Violent reactions possible with:

mineral acids, sulfur, Oxidizing agents

Conditions to avoid

Warming.

Incompatible materials

rubber, various plastics

Hazardous decomposition products

no information available

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Target Organs

Eyes

Skin

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Respiratory system
Blood
Central nervous system
Bone

Acute oral toxicity

LD50 Rat: 930 mg/kg (IUCLID) (Regulation (EC) No 1272/2008, Annex VI)

LDLO human: 50 mg/kg (IUCLID)

absorption

Symptoms: Nausea

Acute inhalation toxicity

LC50 Rat: 44 mg/l; 4 h (IUCLID)

absorption

Symptoms: Possible damages:, mucosal irritations

Acute dermal toxicity

LD50 Rabbit: > 8,260 mg/kg
(IUCLID)

absorption

Skin irritation

Rabbit

Result: Irritations

OECD Test Guideline 404

Drying-out effect resulting in rough and chapped skin.

Causes skin irritation.

Eye irritation

Rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

Genotoxicity in vivo

Mutagenicity (mammal cell test): chromosome aberration.

Result: positive

(National Toxicology Program)

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

(National Toxicology Program)

CMR effects

Carcinogenicity:

May cause cancer. Positive evidence from human epidemiological studies.

Mutagenicity:

May cause genetic defects.

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Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

Target Organs: Blood

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

Carcinogenicity

IARC	Group 1: Carcinogenic to humans
	benzene 71-43-2
OSHA	
	benzene 71-43-2
NTP	Known carcinogen.
	benzene 71-43-2
ACGIH	A1: Confirmed human carcinogen
	benzene 71-43-2

Further information

Systemic effects:

After absorption:

agitation, euphoria, Headache, Dizziness, inebriation, Tiredness, CNS disorders, narcosis, respiratory arrest

Subacute toxicity

After a latency period:

Changes in the blood count, hemolysis

This substance should be handled with particular care.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 *S.gairdnerii*: 5.9 mg/l; 96 h

OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

EC50 *Daphnia magna* (Water flea): 9.2 mg/l; 48 h (ECOTOX Database)

Toxicity to algae

IC50 *Pseudokirchneriella subcapitata* (green algae): 29 mg/l; 72 h

OECD Test Guideline 201

Toxicity to bacteria

EC10 *Pseudomonas putida*: 168 mg/l (Lit.)

Persistence and degradability

Biodegradability

Readily biodegradable.

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Theoretical oxygen demand (ThOD)

3,100 mg/g
(Lit.)

Ratio BOD/ThBOD

BOD5 71 %
(Lit.)

BOD20 80 %
(Lit.)

Ratio COD/ThBOD

19 %
(Lit.)

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 2.13
(experimental)
(Lit.) Bioaccumulation is not expected.

Mobility in soil

Distribution among environmental compartments

Adsorption/Soil
log Koc: 1.93
(experimental)
Mobile in soils (Lit.)

Other adverse effects

Henry constant

562 Pa*m³/mol
at 77 °F (25 °C)
Method: (experimental)
(Lit.) Distribution preferentially in air.

Additional ecological information

Endangers drinking-water supplies if allowed to enter soil or water.
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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SECTION 14. Transport information

Land transport (DOT)

UN number UN 1114
Proper shipping name BENZENE
Class 3
Packing group II
Environmentally hazardous --

Air transport (IATA)

UN number UN 1114
Proper shipping name BENZENE
Class 3
Packing group II
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)

UN number UN 1114
Proper shipping name BENZENE
Class 3
Packing group II
Environmentally hazardous --
Special precautions for user yes
EmS F-E S-D

SECTION 15. Regulatory information

United States of America

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

benzene	71-43-2	100 %
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SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients

benzene

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients

benzene

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

benzene

Pennsylvania Right To Know

Ingredients

benzene

New Jersey Right To Know

Ingredients

benzene

California Prop 65 Components

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Ingredients

benzene

California Prop 65 Components

WARNING: this product contains a chemical known in the State of California to cause cancer.

Ingredients

benzene

Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

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Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
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.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 10/01/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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