SAFETY DATA SHEET FOR CHEMICAL PRODUCTS

Compiled according to GB/T 16483, GB/T 17519
Product name: benzene
Revision date: 2020.06.28
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SDS Nr: P2020061905
Version: 1.0

SECTION 1 Chemical product and company identification

Chemical name (English name)	:	benzene
Name of Supplier	:	Braskem S.A.
Address	:	Rua Benzeno, 2391, COPEC, Polo de Camaçari, CEP: 42810-020 -Camaçari/BA-Brasil
Tel.	:	+55-11-3576-9750
Emergency number	:	Chemtrec +(86) 4001-204937 +1-703-741-5970
Name of Importer	:	
Address	:	
Telephone	:	
Email	:	
Recommended use	:	Use as an intermediate Formulation & (re)packing of substances and mixtures

SECTION 2 Hazards identification

Emergency overview

Flammable Liquid

GHS classification

Physical hazards	:	Flammable liquids, Category 2
Health hazards	:	Skin corrosion/irritation, Category 2
	:	Serious eye damage/eye irritation, Category 2
	:	Germ cell mutagenicity, Category 1B
	:	Carcinogenicity, Category 1A
	:	Specific target organ toxicity — Repeated exposure, Category 1
	:	Aspiration hazard, Category 1
Environmental hazards	:	Hazardous to the aquatic environment — Acute Hazard, Category 2
	:	Hazardous to the aquatic environment — Chronic Hazard, Category 3

Other hazards not mentioned above are Not applicable or No data is available.

Label elements

Hazard pictograms (GHS CN) :

Signal word (GHS CN) : Danger.

Hazard statements (GHS CN) :

H225 - Highly flammable liquid and vapour.

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.

H304 - May be fatal if swallowed and enters airways.

H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements (GHS CN)

Prevention precautionary statements :

P233 - Keep container tightly closed.

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P260 - Do not breathe dust/fume/gas/mist/vapours/spray.

P264 - Wash hands, forearms and face thoroughly after handling.

P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P270 - Do not eat, drink or smoke when using this product.

P273 - Avoid release to the environment.

Response Precautionary Statements :

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

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

P337+P313 - If eye irritation persists: Get medical advice/attention.

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P362+P364 - Take off contaminated clothing and wash it before reuse.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

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

P321 - Specific treatment (see supplemental first aid instruction on this label).

P331 - Do NOT induce vomiting.

P370+P378 - In case of fire: Use media other than water to extinguish.

Storage precautionary statements	:	P403+P235 - Store in a well-ventilated place. Keep cool P405 - Store locked up.
Disposal precautionary statements	:	P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Physical and chemical hazards

Highly flammable liquid and vapour.

Health hazards

Causes skin irritation.

Causes serious eye irritation.

May cause genetic defects.

May cause cancer.

Causes damage to organs through prolonged or repeated exposure.

May be fatal if swallowed and enters airways.

Symptoms/effects	:	May cause cancer,May cause genetic defects.
Symptoms/effects after eye contact	:	Irritating to eyes.
Symptoms/effects after ingestion	:	May cause gastrointestinal irritation, nausea, vomiting and diarrhoea,Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis
Symptoms/effects after inhalation	:	Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness
Symptoms/effects after skin contact	:	Causes skin irritation,Prolonged/repetitive skin contact may cause skin defattening or dermatitis,Repeated exposure may cause skin dryness or cracking,Redness
Chronic symptoms	:	Chronic inhalation may result in chronic solvent encephalopathy or "chronic painter's syndrome" a

central nervous system disorder that can follow many years of heavy exposure to solvents.

Environmental hazards

Harmful to aquatic life with long lasting effects.

Other hazards

No additional information available

SECTION 3 Composition/information on ingredients

Product form : Substance.

Name	CAS-No.	Concentration (%)
Benzene	71-43-2	100

SECTION 4 First aid measures

Emergency

First-aid measures general : IF exposed or concerned: Get medical advice/attention.

First-aid measures after inhalation : Remove casualty to fresh air and keep warm and at rest.

In case of irregular breathing or respiratory arrest provide artificial respiration.

In case of breathing difficulties administer oxygen.

Immediately get medical attention.

First-aid measures after skin contact : Rinse immediately with plenty of water (for at least 15 minutes).

Immediately get medical attention.

Discard contaminated clothing

First-aid measures after eye contact : Rinse immediately and plentifully with water, also under the eyelids, for at least 20 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately get medical attention.

First-aid measures after ingestion : Do not induce vomiting.

If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person.

Immediately get medical attention.

Most Important Symptoms/Effects

May cause cancer

May cause genetic defects.

Irritating to eyes.

May cause gastrointestinal irritation, nausea, vomiting and diarrhoea

Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis

Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness

Causes skin irritation.

Prolonged/repetitive skin contact may cause skin defattening or dermatitis.

Repeated exposure may cause skin dryness or cracking.

Redness

Chronic inhalation may result in chronic solvent encephalopathy or "chronic painter's syndrome" a central nervous system disorder that can follow many years of heavy exposure to solvents.

Personal Protection in First Aid and Measures

No additional information available

Notes for the doctor

Note to physician : : Treat symptomatically.

SECTION 5 Fire fighting measures

Extinguishing media

Suitable extinguishing media : Carbon dioxide (CO2), dry chemical powder, foam
Water fog.

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire

Special hazard

Fire hazard : Highly flammable liquid and vapour.
This material can accumulate static charge by flow or agitation and can be ignited by static discharge.
Vapours may cause fire/explosion if source of ignition is present
Heavier than air, vapours may travel long distances along ground, ignite and flash back to source
Will float and can be reignited on water surface
Under fire conditions closed containers may rupture or explode
On combustion forms:
Carbon monoxide.
Carbon dioxide
Formaldehyde
ketone.

Explosion hazard : Vapours can form explosive mixtures with air.

Advice for firefighters and protective measures

Firefighting instructions	:	Do not approach fire except upwind and only with proper skin and respiratory protection (supplied air only) Cool closed containers exposed to fire with water spray
Protective equipment for firefighters	:	Extra personal protection: complete protective clothing including self-contained breathing apparatus In case of fire: Wear self-contained breathing apparatus. Refer to chapter 8.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

General measures	:	Evacuate unnecessary personnel
Personal Precautions, Protective Equipment and Emergency Procedures	:	No additional information available

For non-emergency personnel

Protective equipment	:	Wear suitable protective clothing, gloves and eye/face protection Refer to chapter 8.
Emergency procedures	:	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Evacuate unnecessary personnel

For emergency responders

Protective equipment	:	Wear suitable protective clothing, gloves and eye/face protection. Refer to chapter 8.
Emergency procedures	:	Eliminate leaks immediately. Eliminate all ignition sources if safe to do so. Ventilate affected area. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing
Environmental precautions	:	Avoid discharge to the environment Do not flush down sewers Do not allow to enter into surface water or drains. Do not allow run-off from fire fighting to enter drains or water courses Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Methods and Equipment for Containment and Cleaning up

Methods for cleaning	:	No additional information available

For containment	:	Stop leak if safe to do so. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams Ventilate affected area.

Prevention Measures for Secondary Accidents

Prevention Measures for Secondary Accidents	:	No additional information available
Other information	:	Bioremediation of contaminated water bodies using granulated activated charcoal has been demonstrated to be the best method of removal from contaminated water bodies Recovery and remediation of polluted soil and water can be accomplished through the Fenton reaction

SECTION 7 Handling and storage

Handling

Precautions for safe handling	:	Spilled product must never be returned to the original container for recycling Use grounded electrical/mechanical equipment Ground/bond container and receiving equipment. Avoid producing mist or vapours by heating of opened receptacle/container
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice Always wash hands and face immediately after handling this product, and once again before leaving the workplace
Local and general ventilation	:	No additional information available

Storage

Storage conditions	:	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep in original containers closed Keep stored the least quantity possible Store at room temperature Store in dry, cool, well-ventilated area
Technical measures	:	Ground/bond container and receiving equipment.
Material used in packaging/containers	:	No additional information available
Incompatible materials	:	Oxidizing agents. Strong acid. Halogenated compounds.
Packaging materials	:	stainless steel Carbon steel PVC

SECTION 8 Exposure controls / Personal protection equipment

Occupational Exposure Limits

benzene (71-43-2)	
China - Occupational Exposure Limits	
Local name	苯# Benzene
OEL TWA	6 mg/m³
OEL STEL	10 mg/m³
Remark (CN)	皮 G1（对人致癌(Carcinogenic to humans)）
Regulatory reference	GBZ 2.1-2019
USA - ACGIH - Occupational Exposure Limits	
Local name	Benzene
ACGIH TWA (ppm)	0.5 ppm
ACGIH STEL (ppm)	2.5 ppm
Remark (ACGIH)	Leukemia

Biological limit values

No additional information available

Monitoring methods

No additional information available

Appropriate engineering controls : Local exhaust and general room ventilation are both essential to prevent accumulation of flammable vapour
Use explosion-proof equipment

Personal protective equipment

Environmental exposure controls : Avoid release to the environment.

Hand protection : Impermeable protective gloves
It is recommended that the glove supplier be consulted to ensure the protective gloves are resistant to chemicals in this product

Eye protection : Chemical goggles or face shield with safety glasses

Skin and body protection : Wear suitable protective clothing or Rubber apron

Respiratory protection : Approved organic vapour respirator
An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits

SECTION 9 Physical and chemical properties

Physical state : Liquid

Appearance : No data available

Colour : Clear to light yellow

Odour : characteristic,aromatic hydrocarbons

pH : No data available

Relative evaporation rate (butylacetate=1)	:	2.8
Melting point	:	5.49 ° C Atm. press.: 1013 hPa Decomposition: 'no' Sublimation: 'no'
Freezing point	:	5.51 ° C
Boiling point	:	80.1 ° C
Flash point	:	-11 ° C (closed cup)
Auto-ignition temperature	:	498 ° C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Flammable
Critical temperature	:	288.9 ° C.
Vapour pressure	:	77 mm Hg at 20 ° C
Critical pressure	:	4894 kPa (48.3 atm)
Relative vapour density at 20 ° C	:	2.77
Density	:	0.88
Solubility	:	soluble in most organic solvents.
Solubility in water	:	sparingly soluble.
Partition coefficient n-octanol/water (Log Pow)	:	1.18 - 1.9 (also reported 2.13 - 2.15)
Viscosity, dynamic		0.604 mPa • s Temp.: 'other:25.0° C' Parameter: 'dynamic viscosity (in mPa s)'
Explosive limits (vol %)	:	1.3 - 8 vol %
Lower explosive limit (LEL)	:	No data available
Upper explosive limit (UEL)	:	No data available
Radioactive	:	No

SECTION 10 Stability and reactivity

Reactivity	:	Reacts violently with (some) halogens
Chemical stability	:	Stable at ambient temperature and under normal conditions of use
Possibility of hazardous reactions	:	None known under normal conditions of use
Conditions to avoid	:	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Avoid static electricity discharges
Incompatible materials	:	Oxidizing agents Strong acids Halogenated compounds
Hazardous decomposition products	:	Carbon dioxide (CO2). Carbon monoxide. Formaldehyde ketone.
Other properties	:	No additional information available

SECTION 11 Toxicological information

Acute toxicity

Acute toxicity (oral) : Based on available data, the classification criteria are not met.

Acute toxicity (dermal) : Based on available data, the classification criteria are not met.

Acute toxicity (inhalation) : Based on available data, the classification criteria are not met.

benzene	
LD50 oral rat	> 2000 mg/kg
LD50 dermal rabbit	> 8260 mg/kg
LC50 inhalation rat (mg/l)	43.767 mg/l air Animal: rat, Animal sex: female, Guideline: OECD Guideline 403 (Acute Inhalation Toxicity), 95% CL: 41690 - 45939

Skin corrosion/irritation

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation

Serious eye damage/irritation : Causes serious eye irritation.

Respiratory or skin sensitisation

Respiratory or skin sensitisation : Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Germ cell mutagenicity : May cause genetic defects.

Carcinogenicity

Carcinogenicity : May cause cancer.

benzene	
IARC group	1 - Carcinogenic to humans
National Toxicity Program (NTP) Status	Known Human Carcinogens

Reproductive toxicity

Reproductive toxicity : Based on available data, the classification criteria are not met.

STOT-single exposure

STOT-single exposure : Based on available data, the classification criteria are not met.

STOT-repeated exposure

STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.

benzene	
NOAEL (oral, rat, 90 days)	100 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
NOAEC (inhalation, rat, vapour, 90 days)	0.096 mg/l air Animal: rat, Guideline: OECD Guideline 412 (Subacute Inhalation Toxicity: 28-Day Study), Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study)

Aspiration hazard

Aspiration hazard : May be fatal if swallowed and enters airways.

benzene	
Density	0.88

SECTION 12 Ecological information

Ecotoxicity

Ecology - general : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Hazardous to the aquatic environment, short-term (acute) : Toxic to aquatic life.

Hazardous to the aquatic environment, long-term (chronic) : Harmful to aquatic life with long lasting effects.

No additional information available

Persistence and degradability

No additional information available

Bioaccumulative potential

benzene	
Partition coefficient n-octanol/water (Log Pow)	1.18 - 1.9 (also reported 2.13 - 2.15)

Mobility in soil

benzene	
Partition coefficient n-octanol/water (Log Pow)	1.18 - 1.9 (also reported 2.13 - 2.15)

Other adverse effects

Classification procedure (Ozone) : No data available

Results of PBT and vPvB assessment

Results of PBT assessment : This substance does not meet the criteria for classification as PBT or vPvB.

SECTION 13 Disposal considerations

Waste treatment methods : No additional information available

Contaminated container and packaging : No additional information available

Additional information : No additional information available

Product/Packaging disposal recommendations : Dispose of this material and its container at hazardous or special waste collection point

Regional legislation (waste) : Dispose of contents/container to comply with applicable local, national and international regulations.

Consult the appropriate authorities about waste disposal.

SECTION 14 Transport information

Overland transport (JT/T 617)	UN RTDG	Transport by sea	Air transport	Inland waterway transport	Rail transport
UN number					
Not applicable	Not applicable	1114	1114	1114	1114
UN proper shipping name					
Not applicable	Not applicable	BENZENE	Benzene	BENZENE	BENZENE
Transport document description					
Not applicable	Not applicable	UN 1114 BENZENE, 3, II (-11° C c.c.)	UN 1114 Benzene, 3, II	UN 1114 BENZENE, 3, II	UN 1114 BENZENE, 3, II
Transport hazard class(es)					
Not applicable	Not applicable	3	3	3	3
Not applicable	Not applicable				
Packing group					
Not applicable	Not applicable	II.	II.	II.	II.

Overland transport (JT/T 617)	UN RTDG	Transport by sea	Air transport	Inland waterway transport	Rail transport
Environmental hazards					
Not applicable	Not applicable	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No

Special transport precautions

Overland transport (JT/T 617)

Not applicable

UN RTDG

Not applicable

Transport by sea

Limited quantities (IMDG)	: 1 L.
Excepted quantities (IMDG)	: E2.
Packing instructions (IMDG)	: P001.
IBC packing instructions (IMDG)	: IBC02.
Tank instructions (IMDG)	: T4.
Tank special provisions (IMDG)	: TP1.
Stowage category (IMDG)	: B.
Flash point (IMDG)	: -11° C c.c.
Properties and observations (IMDG)	: Colourless liquid with a characteristic odour. Flashpoint: -11° C c.c. Explosive limits: 1.4% to 8% Freezing point 5° C, flashes below its freezing point. Immiscible with water. Narcotic. Exposure to this substance may produce serious chronic effects of a toxic nature.

Air transport

PCA Excepted quantities (IATA)	: E2.
PCA Limited quantities (IATA)	: Y341.
PCA limited quantity max net quantity (IATA)	: 1L.
PCA packing instructions (IATA)	: 353.
PCA max net quantity (IATA)	: 5L.
CAO packing instructions (IATA)	: 364.
CAO max net quantity (IATA)	: 60L.
ERG code (IATA)	: 3H.

Inland waterway transport

Classification code (ADN)	: F1.

Limited quantities (ADN)	: 1 L.
Excepted quantities (ADN)	: E2.
Carriage permitted (ADN)	: T.
Equipment required (ADN)	: PP, EX, A.
Ventilation (ADN)	: VE01.
Number of blue cones/lights (ADN)	: 1

Rail transport

Classification code (RID)	: F1.
Limited quantities (RID)	: 1L.
Excepted quantities (RID)	: E2.
Packing instructions (RID)	: P001, IBC02, R001.
Mixed packing provisions (RID)	: MP19.
Portable tank and bulk container instructions (RID)	: T4.
Portable tank and bulk container special provisions (RID)	: TP1.
Tank codes for RID tanks (RID)	: LGBF.
Transport category (RID)	: 2.
Colis express (express parcels) (RID)	: CE7.
Hazard identification number (RID)	: 33.

SECTION 15 Regulatory information

New Chemical Substance Environmental Management Registration Measures (MEE Order 12 of 2020)

Inventory of Existing Chemical Substances in China (IECSC) : Listed
Benzene (CAS-No. 71-43-2)

SECTION 16 Other information

Sources of Key data : MSDS

Abbreviations and acronyms

ACGIH	ACGIH (American Conference of Governement Industrial Hygienists)
IARC	IARC (International Agency for Research on Cancer)
ADR	Overland transport (ADR)
PVC	PVC (Polyvinyl chloride).

SDS	SDS - Safety Data Sheet
TWA	TWA- Time Weighted Average
STEL	Short-Term Exposure Limit
PEL	PEL- Permissible Exposure Level
OSHA	OSHA - Occupational Safety and Health Administration
DNEL	Derived-No Effect Level
PNEC	Predicted No-Effect Concentration

SDS CN (GB/T 17519-2013)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.