

SECTION 1 Chemical product and company identification

Product Chinese name	: No additional information available
Product English name	: Isoprene
Chemical Chinese name	: 2-甲基 1,3-丁二烯
Chemical English name	: isoprene (stabilised); 2-methyl-1,3-butadiene
CAS No.	: 78-79-5
Chemical formula	: C ₅ H ₈
Name of company	: Braskem S.A.
Address	: Rua Eteno, 1561, Polo Petroquímico de Camaçari Camaçari, BA, CEP: 42810-000, Brasil
Zip code	: 42810-000
Tel.	: +55 (71) 3413-3600
E-mail	: productsafety@braskem.com
Emergency number	: CHEMTREC China: +(86) 4001-204937 CHEMTREC International: +1 703-741-5970
Emergency number in China (24 hours)	: No additional information available
Recommended use of the chemical	: Manufacturer. Distribution. Polymer production.
Restricted use of the chemical	: No additional information available

SECTION 2 Hazards identification

Emergency overview


Extremely flammable colourless liquid. Suspected of causing genetic defects. Suspected of causing cancer. Toxic to aquatic life with long lasting effects.

GHS hazard classification

Physical hazards	: Flammable liquids, Category 1
Health hazards	: Germ cell mutagenicity, Category 2 : Carcinogenicity, Category 2
Environmental hazards	: Hazardous to the aquatic environment – Acute hazard, Category 2 : Hazardous to the aquatic environment – Chronic hazard, Category 2

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

Label elements

Hazard pictograms (GHS CN)	: 
Signal word (GHS CN)	: Danger.

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Hazard statements (GHS CN) : H224 - Extremely flammable liquid and vapour
H341 - Suspected of causing genetic defects
H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (GHS CN)

Prevention measures : 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.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Incident response : P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P370+P378 - In case of fire: Use media other than water to extinguish.
P391 - Collect spillage.

Safe storage : P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.

Disposal : 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

Extremely flammable liquid and vapour

Health hazards

Suspected of causing genetic defects

Suspected of causing cancer

Environmental hazards

Toxic to aquatic life with long lasting effects

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Other hazards

May cause eye, skin and respiratory system irritation

Prolonged or repeated contact with skin or mucous membrane result in irritation symptoms such as redness, blistering, dermatitis, etc.

CNS depression.

In high concentrations may cause asphyxiation.

Vapours can travel considerable distances to a source of ignition where they can ignite, flash back, or explode.

This material or its emissions may induce blood disorders and/or aggravate pre-existing blood disorders.

SECTION 3 Composition/information on ingredients

Product form : Substance.

Ingredient(s)	Concentration or concentration ranges (w/w %)	CAS No.
isoprene (stabilised); 2-methyl-1,3-butadiene	≥99,5	78-79-5

SECTION 4 First-aid measures

Description of necessary first-aid measures

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

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
Remove victim to fresh air.
Do not apply mouth-to-mouth resuscitation.
In case of irregular breathing or respiratory arrest provide artificial respiration.
Immediately get medical attention.

First-aid measures after skin contact : Rinse immediately with plenty of water for 15 minutes.
Do not rub the skin and eyes after direct contact with the product.
Remove contaminated clothing and shoes.
Discard contaminated clothing.
Immediately get medical attention.
Rinse skin with water/shower.
Take off immediately all contaminated clothing.

First-aid measures after eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum).
Remove contact lenses, if present and easy to do. Continue rinsing.
Do not rub the skin and eyes after direct contact with the product.
Seek immediate medical advice.
Rinse eyes with water as a precaution.

First-aid measures after ingestion : Do not induce vomiting.
If the person is fully conscious, make him/her drink water. Never give an unconscious person anything to drink.

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Seek medical attention immediately.

Call a poison center or a doctor if you feel unwell.

Most important symptoms/effects

- Symptoms/effects after eye contact : May cause moderate irritation.
- Symptoms/effects after ingestion : Ingestion may cause nausea and vomiting.
- Symptoms/effects after inhalation : Inhalation may cause irritation, cough, shortness of breath.
Asphyxiant in high concentrations.
May have a narcotic effect at high concentrations.
- Symptoms/effects after skin contact : May cause moderate irritation.
Effects of skin contact may include : redness.
- Chronic symptoms : This material or its emissions may induce blood disorders and/or aggravate pre-existing blood disorders.

Advices for first aid responders

No additional information available

Notes for the doctor

- Note to physician : : Use personal protective equipment as required.
Refer to chapter 8.

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 heavy stream of water.
Use of heavy stream of water may spread fire.

Specific hazards

- Fire hazard : Extremely flammable liquid and vapour.
This material can accumulate static charge by flow or agitation and can be ignited by static discharge.
The vapours are heavier than air and can accumulate in high concentrations on the ground, in cavities, channels and cellars.
Vapours can travel considerable distances to a source of ignition where they can ignite, flash back, or explode.
Combustion generates:
hydrocarbons
Extremely flammable liquid and vapour.
- Hazardous decomposition products in case of fire : Toxic fumes may be released
- Explosion hazard : Prolonged exposure to fire may cause containers to rupture/explode
Can polymerise exothermically if heated, exposed to air, sunlight or by addition or free radical initiators.
- Reactivity in case of fire : React violently in contact with oxidation agents. Reacts violently with (some) halogens. Can polymerise exothermically if heated, exposed to air, sunlight or by addition or free radical initiators.

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Advice for firefighters and protective measures

- Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
Stop leak if safe to do so.
Fight fire with normal precautions from a reasonable distance.
Do not approach fire except upwind and only with proper skin and respiratory protection (supplied air only).
Cool adjacent tanks / containers / drums with water jet.
- Protective equipment for firefighters : Wear recommended personal protective equipment.
In case of fire: Wear self-contained breathing apparatus.
Do not attempt to take action without suitable protective equipment.
Self-contained breathing apparatus.
Complete protective clothing.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

- General measures : Eliminate all ignition sources if safe to do so.
When using do not smoke.
Use personal protective equipment as required.
Stop leak if safe to do so.
- 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 : Ventilate spillage area
Avoid all eye and skin contact and do not breathe vapour and mist
Evacuate unnecessary personnel
Eliminate all ignition sources if safe to do so.
Do not smoke
No open flames, no sparks, and no smoking

For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment
Wear suitable protective clothing, gloves and eye/face protection.
In case of fire: Wear self-contained breathing apparatus.
Refer to chapter 8.
For further information refer to section 8: "Exposure controls/personal protection"
- Emergency procedures : Avoid all eye and skin contact and do not breathe vapour and mist
Evacuate and limit access
Eliminate every possible source of ignition
Stop leak if safe to do so.

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Environmental precautions

- Avoid release to the environment
- Prevent spread over a wide area (e.g. by containment or oil barriers).
- Absorb remaining liquid with sand or inert absorbent and remove to safe place
- Collect in closed containers for disposal.
- Do not empty into drains.

Methods and material for containment and cleaning up

- Methods for cleaning : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams
- For containment : Prevent spread over a wide area (e.g. by containment or oil barriers).
Collect spillage.

Prevention measures for secondary accidents

- Prevention Measures for Secondary Accidents : No additional information available
- Other information : Dispose of materials or solid residues at an authorized site

SECTION 7 Handling and storage

Handling

- Precautions for safe handling : Ensure good ventilation of the work station
Avoid producing mist or vapours by heating of opened receptacle/container.
Ground/bond container and receiving equipment.
Keep container closed when not in use
Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers to flames, sparks, heat, or other potential ignition sources.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Ground/bond container and receiving equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Flammable vapours may accumulate in the container
Use explosion-proof equipment
Wear personal protective equipment
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
- Hygiene measures : Do not eat, drink or smoke when using this product
Wash hands thoroughly after handling.
- Local and general ventilation : No additional information available

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Storage

- Storage conditions : Store in a well-ventilated place. Keep cool.
Store in tightly closed, properly ventilated containers away from heat, sparks, open flame.
Protect containers against damage.
Keep stored the least quantity possible.
Store in a well-ventilated place.
Keep cool.
Keep container tightly closed.
Store locked up.
- Technical measures : Use explosion-proof ventilating equipment.
Use explosion-proof electrical equipment.
Use grounded electrical/mechanical equipment.
Use only non-sparking tools.
Ground/bond container and receiving equipment.
- Incompatible materials : Strong oxidizing agents. Halogens.
- Material used in packaging/containers : PVC (Polyvinyl chloride).
stainless steel.
Carbon steel.
This material may attack some forms of plastics, rubbers and coatings.

SECTION 8 Exposure controls / Personal protection equipment

Occupational exposure limits

No additional information available

Biological limit values

No additional information available

Monitoring methods

No additional information available

Appropriate engineering controls

- Use explosion-proof ventilating equipment.
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure
Ensure good ventilation of the work station

Personal protective equipment

- Personal protective equipment : An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits.
Gloves.
Protective goggles.
Protective clothing.
- Environmental exposure controls : Avoid release to the environment.
- Materials for protective clothing : PVC (Polyvinyl chloride).
PE (polyethylene).

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Hand protection	: Protective gloves made of PVC Materials to avoid: Butyl caoutchouc (butyl rubber). NR (Natural rubber (caoutchouc), Natural latex).
Eye protection	: if necessary: tightly fitting safety goggles. Safety glasses.
Skin and body protection	: Use chemically protective clothing.
Respiratory protection	: An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits. [In case of inadequate ventilation] wear respiratory protection.

SECTION 9 Physical and chemical properties

Physical state	: Liquid
Appearance	: No data available
Colour	: Colourless
Odour	: aromatic hydrocarbons
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: Not applicable
Melting point	: - 145.9 °C
Freezing point	: No data available
Boiling point	: 34 °C @ 760 mmHg
Flash point	: - 54 °C Closed cup
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability	: Extremely flammable liquid and vapour.
Vapour pressure	: 63.397 kPa (21.1°C)
Critical pressure	: 37896 hPa
Relative vapour density at 20°C	: 2.4 Relative density (air = 1)
Relative density	: 0.679 g/cm ³
Density	: 0.681 @ 20°C (Water = 1)
Solubility	: Soluble in:, Benzene., Diethyl ether, acetone, Ether.
Solubility in water	: 642 mg/l (25°C)
Partition coefficient n-octanol/water (Log Pow)	: 2.42
Partition coefficient n-octanol/water (Log Kow)	: 2.58
Viscosity, kinematic	: 0.308 mm ² /s
Viscosity, dynamic	: 0.21 mPa·s @ 20-25°C
Explosive limits (vol %)	: 1.5 – 8.9 vol %
Lower explosion limit	: No data available

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Upper explosion limit : No data available

Radioactive : No

SECTION 10 Stability and reactivity

Chemical stability : May form explosive peroxides.

Reactivity : React violently in contact with oxidation agents. Reacts violently with (some) halogens. Can polymerise exothermically if heated, exposed to air, sunlight or by addition of free radical initiators. Extremely flammable liquid and vapour.

Possibility of hazardous reactions : Hazardous polymerization.
Can polymerise exothermically if heated, exposed to air, sunlight or by addition of free radical initiators.

Conditions to avoid : Direct sunlight. Pure oxygen. Open flame. Rust. Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

Incompatible materials : Strong oxidizing agents.
Halogens.
Strong acids.
alcohols.

Hazardous decomposition products : Toxic fumes.
Irritating gases.

Other properties : No additional information available

SECTION 11 Toxicological information

Acute toxicity

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

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

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

Isoprene (78-79-5)	
LD50 dermal rat	> 2000 mg/kg OECD Guideline 402 (Acute Dermal Toxicity)
LC50 Inhalation - Rat	180000 mg/m ³ 4 Hours

Skin corrosion/irritation

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)

Serious eye damage/eye irritation

Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)

Respiratory or skin sensitisation

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity

Germ cell mutagenicity : Suspected of causing genetic defects.

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Carcinogenicity

Carcinogenicity : Suspected of causing cancer.

isoprene (stabilised); 2-methyl-1,3-butadiene (78-79-5)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicity Program (NTP) Status	Reasonably anticipated to be Human Carcinogen

Reproductive toxicity

Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)

STOT - single exposure

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)

STOT - repeated exposure

STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)

Aspiration hazard

Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

SECTION 12 Ecological information

Ecotoxicity

Ecology - general : Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Ecology - air : Contributes to the formation of photochemical smog.

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

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

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Isoprene (78-79-5)	
LC50 - Fish [1]	7.43 mg/l OECD Guideline 203 (Fish, Acute Toxicity Test)
EC50 - Crustacea [1]	5.77 mg/l Daphnia magna OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Partition coefficient n-octanol/water (Log Kow)	2.58
Partition coefficient n-octanol/water (Log Pow)	2.42

Persistence and degradability

Isoprene (78-79-5)	
Not rapidly degradable	Yes
Persistence and degradability	Inherently biodegradable
BOD (% of ThOD)	61 % ThOD (28 d - activated sludge, non-adapted)

Bioaccumulative potential

Isoprene (78-79-5)	
Bioaccumulative potential	Low bioaccumulation potential
Partition coefficient n-octanol/water (Log Kow)	See section 12.1 on ecotoxicology 2.58
Partition coefficient n-octanol/water (Log Pow)	2.42

Mobility in soil

Isoprene (78-79-5)	
Bioaccumulative potential	Low bioaccumulation potential
Partition coefficient n-octanol/water (Log Kow)	See section 12.1 on ecotoxicology 2.58
Partition coefficient n-octanol/water (Log Pow)	2.42
Ecology - soil	Very mobile.

Other adverse effects

- Classification procedure (Ozone) : Not classified
Other adverse effects : No additional information available

SECTION 13 Disposal considerations

- Waste treatment methods** : Dispose of contents/container in accordance with licensed collector's sorting instructions.
- Contaminated container and packaging** : No additional information available
- Additional information** : Flammable vapours may accumulate in the container.

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Product/Packaging disposal recommendations : Disposal through controlled incineration or authorised waste dump.

SECTION 14 Transport information

In accordance with JT/T 617 / IMDG / IATA

Overland transport (JT/T 617)	Transport by sea	Air transport
UN number		
1218	1218	1218
Proper shipping name		
ISOPRENE, STABILIZED	ISOPRENE, STABILIZED	Isoprene, stabilized
Transport hazard class(es)		
3	3	3
Packing group		
I.	I.	I.
Environmental hazards		
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes
<p>Consult the associated transport regulations for available and applicable exceptions or exemptions.</p> <p>The suitable shipping classification must be evaluated at the time of shipment due to the possibility for variations in regard to the transportation of this material considering the requirements, modes of transport, packaging, packaging configuration, quantity etc. Please consult the appropriate regulation for specific shipping information and requirements.</p> <p>This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation information can be obtained through the authorized transporting corporation. It is the responsibility of the transporting corporation to follow all applicable laws, regulations and rules relating to the transportation of this product.</p>		

Special transport precautions

Overland transport (JT/T 617)

- Classification code (JT/T 617) : F1.
- Limited quantities (JT/T 617) : 0.
- Excepted quantities (JT/T 617) : E3.
- Packing instructions (JT/T 617) : P001.
- Mixed packing provisions (JT/T 617) : MP7, MP17.

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Portable tank and bulk container instructions (JT/T 617) : T11.
Portable tank and bulk container special provisions (JT/T 617) : TP2.
Tank codes (JT/T 617) : L4BN.
Vehicle for tank carriage (JT/T 617) : FL.
Transport category (JT/T 617) : 1.
Tunnel restriction code (JT/T 617) : D/E.
Special provisions for carriage - Operation (JT/T 617) : S2, S20.
Hazard identification number (JT/T 617) : 339.
Orange-coloured plate (JT/T 617) :



Transport by sea

Special provisions (IMDG) : 386.
Limited quantities (IMDG) : 0.
Excepted quantities (IMDG) : E3.
Packing instructions (IMDG) : P001.
Tank instructions (IMDG) : T11.
Tank special provisions (IMDG) : TP2.
EmS-No. (Fire) : F-E.
EmS-No. (Spillage) : S-D.
Stowage category (IMDG) : D.
Stowage and handling (IMDG) : SW1.
Flash point (IMDG) : -48°C c.c.
Properties and observations (IMDG) : Colourless, volatile liquid. Flashpoint: -48°C c.c. Explosive limits: 1.5% to 9.7% Boiling point: 34°C. Immiscible with water.

Air transport

PCA Excepted quantities (IATA) : E3.
PCA Limited quantities (IATA) : Forbidden.
PCA limited quantity max net quantity (IATA) : Forbidden.
PCA packing instructions (IATA) : 351.
PCA max net quantity (IATA) : 1L.
CAO packing instructions (IATA) : 361.
CAO max net quantity (IATA) : 30L.
Special provisions (IATA) : A209.
ERG code (IATA) : 3H.

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SECTION 15 Regulatory information

Regulation on the Safety Management of Hazardous Chemicals : Catalogue of Hazardous Chemicals (2015)
1031, 2-Methyl-1,3-butadiene

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

Inventory of Existing Chemical Substances in China (IECSC) : Contains listed substance(s)
1,3-Butadiene, 2-methyl- (CAS-No. 78-79-5)

Regulations on the Safe Management of Hazardous Chemicals (Decree 591 of the State Council)

Catalogue of Hazardous Chemicals (2015) : Contains Hazardous Chemical(s)
2-Methyl-1,3-butadiene(inhibited) (CAS-No. 78-79-5)
Considered as Hazardous Chemical(s)

Other domestic regulatory lists

Dangerous Goods List (GB 12268-2012) : Contains listed substance(s)
ISOPRENE, STABILIZED (CAS-No. 78-79-5)

SECTION 16 Other information

Safety Data Sheet (SDS), China

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.