

## SAFETY DATA SHEET

**Product:** ACRYLONITRILE

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**SECTION 1: IDENTIFICATION**

Identification of the product	ACRYLONITRILE.
Recommended use of the chemical and restrictions on use	Industrial use.
Company	COMPANHIA BRASILEIRA DE ESTIRENO.
Address	Rua Hidrogênio, 824 - Polo Petroquímico – Camaçari – BA - CEP: 42816-140, Brazil.
Telephone number	55 (71) 3878-6313
Emergency telephone number	0800 110 8270 Pró-Química

**SECTION 2: HAZARD IDENTIFICATION**

Classification of the substance or mixture	Flammable liquids – Category 2
	Acute toxicity – Oral – Category 3
	Acute toxicity – Dermal – Category 2
	Acute toxicity – Inhalation – Category 2
	Skin corrosion/irritation – Category 2
	Eye damage/irritation – Category 1
	Skin sensitization – Category 1
	Carcinogenicity – Category 1B
	Reproductive toxicity – Category 2
	Specific target organ toxicity – single exposure – Category 3
Classification system adopted	Hazardous to the aquatic environment – Acute – Category 2
	Hazardous to the aquatic environment – Chronic – Category 2
Other hazards which do not result in classification	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations. The product does not have other hazards.

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Adequate labeling elements

Pictograms



Signal word

**DANGER**

Hazard statement(s):

H225 Highly flammable liquid and vapour.  
 H301 Toxic if swallowed.  
 H311 Toxic in contact with skin.  
 H315 Causes skin irritation.  
 H317 May cause an allergic skin reaction.  
 H318 Causes serious eye damage.  
 H331 Toxic if inhaled.  
 H335 May cause respiratory irritation.  
 H350 May cause cancer.  
 H361 Suspected of damaging fertility or the unborn child.  
 H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s):

**PREVENTION:**

P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof electrical, ventilating or lighting equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P261 Avoid breathing mist and vapours.

P264 Wash hands thoroughly after handling.

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

P271 Use only outdoors or in a well-ventilated area.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection and face protection.

**RESPONSE:**

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

P302 + P352 IF ON SKIN: Wash with plenty water and soap.

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

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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.

P311 Call a POISON CENTER or a doctor.

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P312 Call a POISON CENTER or a doctor if you feel unwell.

P321 Specific treatment.

P330 Rinse mouth.

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

P333 + P313 If skin irritation or rash occurs: Get medical advice.

P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.

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

P370 + P378 In case of fire: Use dry chemical powder, alcohol resistant foam or water fog to extinguish.

P391 Collect spillage.

**STORAGE:**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

**DISPOSAL:**

P501 Dispose of contents and container in accordance with local regulations.

**SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS**

## SUBSTANCE

Common chemical name Acrylonitrile.

Common name(s), synonym(s) of 2-Propenenitrile; Cyanoethylene.

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the substance

CAS number 107-13-1.

Ingredients or impurities contributing to the hazard It does not have impurities which contribute to hazards.

Concentration 99,40%.

**SECTION 4: FIRST-AID MEASURES****Routes of exposure**

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse the victim's mouth with water. Call a POISON CENTER or doctor/physician if you feel unwell. Take this SDS..

Skin Wash exposed skin with enough water to remove the material. In case of irritation: Consult a doctor. Take this SDS.

Eye Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. If eye irritation persists: Get medical advice/attention. Take this SDS.

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. Take this SDS.

Most important symptoms/effects, acute and delayed Toxic if swallowed. Fatal in contact with skin and if inhaled. Causes skin irritation with redness and dryness. Causes severe eye damage with burning, lacrimation and pain. May cause allergic skin reactions with dermatitis and pruritus. May cause respiratory irritation with coughing and sneezing.

Indication of immediate medical Along with this MSDS, consult a detailed medical protocol on the

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attention and special treatment  
needed, if necessary

treatment of cyanide poisoning.

After contact with the product, health effects may last 3 hours to start, and could persist for three days.

Avoid contact with the product to help the victim.

If there is contact of the product with the skin or victim's clothing, remove them immediately and wash with plenty of water.

If the victim shows symptoms, antidotes may be needed.

Administer according to clinical condition:

**Oxygen** – Offer a 100% concentration when possible.

**Amyl nitrite** – Administration of Amyl Nitrite should be done through a vial which should be placed close to the patient's mouth and nose for 15 seconds. If breathing does not return to normal, repeat the operation every 2 minutes.

**Sodium Nitrite** – Start administer intravenously 50 g sodium nitrite, with average dose for treatment 300 mg, shall not pass 600 mg.

**Sodium Thiosulfate** – Start administer intravenously 12,5 g sodium thiosulfate, shall not pass 175 g.

**Cianokit (Hidroxicobalamina)** – Start administer intravenously 5 g of hydroxycobalamine, shall not pass 10 g.

**Methylene Blue** - It should be used 100 a 200 mg IV when the amount of methaemoglobin reaches 30%.

OBS: all antidotes must be administer intravenously, should be dilute in Glucose 5% or Saline 0,9 %.

Suggestion of treatment with antidotes:

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TOXICITY LEVEL	SYMPTOMS	TREATMENT	ANTIDOTE
Mildmild	Absence of Symptoms or Mild Symptoms: headache, asthenia, smell and taste dysfunctions, dyspnoea.	Use supportive treatment + O2 100%	01 antidote
Moderate	Usually presents: headache, nausea, vomiting and cardiac arrhythmias.	Use supportive treatment + O2 100%+ Sodium Thiosulfate	02 antidotes
Severe	May occurs, in addition to the previous symptoms, hot flashes, disorders of consciousness, convulsion and severe dyspnea.	Use supportive treatment + O2 100% and/or Amyl nitrite and / or sodium thiosulfate and / or sodium nitrite.	03 antidotes
Critical	Presents loss of consciousness and respiratory and / or cardiorespiratory arrest.	Use supportive treatment + O2 100% and / or amyl nitrite and / or sodium thiosulfate and / or sodium nitrite and / or cyanokit.	03 or more antidotes

**SECTION 5: FIRE-FIGHTING MEASURES**

Suitable extinguishing media	<p>Suitable: Compatible with dry chemical powder, alcohol resistant foam or water fog.</p> <p>Not recommended: Water directly on the burning liquid.</p>
Specific hazards arising from the chemical	<p>Very dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or flames of matches and cigarettes, welding operations, pilot lights and electric motors. Can accumulate static charge by flow or agitation. Vapors from heated liquid can be ignited by static discharge. Vapors are heavier than air and tend to accumulate in low or confined areas, such as sewers and basements. Can</p>

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travel great distances causing retrogression of the flame or new fires both in open environments in as confined ones. Containers may explode if heated. The combustion of the chemical products or containers may form toxic and irritant gases such as carbon monoxide and carbon dioxide, hydrocyanic acid and oxides of nitrogen.

Special protective actions for fire-fighters

Self-contained breathing apparatus (SCBA) with positive pressure and full protective clothing. Containers and tanks involved in the fire can be cooled by water fog.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel

Do not smoke. Do not touch damaged containers or spilled material without wearing suitable clothing. Avoid exposure to the product. Use personal protective equipment as described in section 8.

For emergency responders

Wear full PPE with safety goggles and face shield, Viton or Teflon protective gloves, apron with long sleeves and boots in PVA, PVC or neoprene. Semi-facial respiratory protection mask with organic vapors filter.

Environmental precautions

Avoid that the spilled material reaches waterways or sewage system.

Methods and materials for containment and cleaning up

Use water mist or vapor suppressing foam to reduce the dispersion of vapors. Use natural barriers or spill containment. Collect spilled material and put it into containers. Adsorb the remaining product with dried sand, vermiculite or any other inert material. Put the adsorbed material in appropriate containers



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and remove them to a safe place. Use tools that do not cause sparks to collect absorbed material. For final destination, proceed pursuant to Section 13 of this MSDS.

**SECTION 7: HANDLING AND STORAGE**

## Precautions for safe handling

Safe handling of the substance or mixture

Handle in a well ventilated area or with general system of ventilation/local exhaust. Avoid vapors and mists formation. Avoid contact with incompatible materials. Use personal protective equipment as described in Section 8.

General hygiene:

Wash hands and face thoroughly after handling and before eating, drinking, smoking or going to the bathroom. Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas.

## Conditions for safe storage, including any incompatibilities

Technical measures for prevention of fire and explosion

Keep away from heat, sparks, open flames and hot surfaces. - Do not smoke. Keep container tightly closed. Ground the container vessel and the receiver of the product during transfers. Only use anti-sparking tools. Avoid the accumulation of electrostatic charges. Use electrical equipment, ventilation and lighting explosion proof.

Adequate conditions

Store in a well ventilated place away from sunlight. Keep container closed. Keep stored at room temperature. Addition of stabilizers such as hydroquinone methyl ether is required to ensure product durability. This product may react dangerously with some incompatible materials as highlighted in Section 10.

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Packaging compatibilities      Similar to the original packaging.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

Control parameters

	Common chemical name or technical name	TWA-TLV (ACGIH, 2020)
Occupational exposure limit	Acrylonitrile	2 ppm
*A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans (ACGIH).		
Biological limit:	Not established.	
Other limits and values	IDLH: 60 ppm (NIOSH, 2017).	
Appropriate engineering controls	Promote direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce exposure to product. Maintain atmospheric concentrations of the constituents of the product below occupational exposure limits indicated.	
Individual protection measures, such as personal protective equipment (PPE)		
Eye/face protection	Safety glasses and face shield.	
Skin protection	Waterproof gloves of hexaplas, neoprene, butyl rubber or polyethylene, safety goggles and face shield, suitable neoprene protective clothing, butyl rubber or polyethylene and boots.	
Respiratory protection	It is recommended to use respiratory protective equipment with filters for organic vapors. Based on the inhalation hazard of the product, a risk assessment must be carried out to adequately define respiratory protection in view of the conditions of use of the product.	

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Thermal hazards	It is not necessary to use specific EPIs, since the product does not present thermal hazards.
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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Physical state	Liquid.
Colour	Colorless.
Odour	Slight, acrid.
Melting point/freezing point	- 83.5°C
Boiling point or initial boiling point and boiling range	77.3°C
Flammability	Not available.
Lower and upper explosion limit /flammability limit	Upper: 17% Lower: 3%
Flash point	0°C
Auto-ignition temperature	481°C
Decomposition temperature	Not available.
pH	6.0 – 7.5 (5% aqueous solution)
Kinematic viscosity	Not available.
Solubility	Partially miscible in water. (7.35% at 20°C)
Partition coefficient n-octanol/water (log value)	Not available.
Vapour pressure	86 mmHg at 20°C
Density and/or relative density	0.806 at 20°C

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Relative vapour density 1.83

Particle characteristics Not available.

Other information SAPT: 481°C

**SECTION 10: STABILITY AND REACTIVITY**

Reactivity and chemical stability	Product not reactive. Unstable. Stable if hydroquinone methyl ether is added as an inhibitor.
Possibility of hazardous reactions	Violent polymerization may occur in complete absence of oxygen, exposure to light, heat, pressure or in the presence of strong acids or bases, peroxides or other initiators.
Conditions to avoid	High temperatures, ignition source, luminosity and contact with incompatible materials.
Incompatible material	Ammonia, amines, bromine, copper and copper mixtures, potassium hydroxide, sodium hydroxide and strong acids.
Hazardous decomposition products	There are no known hazardous decomposition products.

**SECTION 11: TOXICOLOGICAL INFORMATION**

Acute toxicity	Toxic if swallowed. Fatal in contact with skin and if inhaled. LD50 (oral, rats): 81 mg/kg LD50 (dermal, rabbits): 200 mg/kg LC50 (Inhalation, rats, 4h): 2.00 mg/L
Skin corrosion/irritation	Causes skin irritation with redness and dryness.
Serious eye damage/irritation	Causes severe eye damage with burning, lacrimation and pain.

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Respiratory or skin sensitization	<p>May cause allergic skin reactions with dermatitis and pruritus.</p> <p>Based on available information about respiratory sensitization, the classification criteria have not been met.</p>
Germ cell mutagenicity	<p>Based on available information, the classification criteria have not been met.international guidelines did not reveal a genotoxic effect of styrene on the liver of mice.</p>
Carcinogenicity	<p>May cause cancer.</p> <p>ACGIH - Classifies acrylonitrile as group A3 - confirmed animal carcinogen with unknown relevance to humans.</p> <p>Animal studies have shown clear evidence of carcinogenicity.</p> <p>IARC - Classifies acrylonitrile as group 2B - Possibly carcinogenic to humans.</p>
Reproductive toxicity	<p>Suspected of damaging fertility or the unborn child.</p> <p>Animal studies have shown evidence of fetal malformation.</p>
STOT - Single exposure	<p>May cause respiratory irritation with coughing and sneezing.</p>
STOT - Repeated exposure	<p>Based on available information, the classification criteria have not been met.</p>
Aspiration hazard	<p>Based on available information, the classification criteria have not been met.</p>

**SECTION 12: ECOLOGICAL INFORMATION**

Ecotoxicity	<p>It is not a marine pollutant according to legislation (IMDG code)</p> <p>LC50 (Cyprinodon variegatus, 96h): 8.6 mg/L</p> <p>EC50 (Daphnia magna, 48h): 7.6-22 mg/L</p> <p>NOEC (Daphnia magna, 21 days): 0.5 mg/L</p> <p>EC50 (Skeletonema costatum, 72h): 14.1 mg/L</p>
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Persistence and degradability	The product does have persistence and it is not considered readily biodegradable. Biodegradability rate: 15 - 23% in 28 days
Bioaccumulative potential	It is not expected potential bioaccumulation in aquatic organisms.
Mobility in soil	No data available.
Other adverse effects	There are not known adverse environmental effects of the product.

**SECTION 13: DISPOSAL CONSIDERATIONS**

## Disposal methods

Product	It must be disposed of as hazardous waste according to local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established for the product.
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**SECTION 14: Transport information**

Road	UN - "United Nations". Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations.
UN Number	1093
UN Proper Shipping Name	ACRYLONITRILE, STABILIZED
Transport hazard class(es):	3 (6.1)

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Packing group:	I
Rail	Convention concerning International Carriage by Rail (COTIF) Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail - RID
UN Number	1093
UN Proper Shipping Name	ACRYLONITRILE, STABILIZED
Transport hazard class(es)	3 (6.1)
Packing group	I
Sea:	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN Number	1093
UN Proper Shipping Name	ACRYLONITRILE, STABILIZED
Transport hazard class(es)	3 (6.1)
Packing group	I
EmS	F-E, S-D
Marine pollutant	It is not a marine pollutant according to legislation (IMDG Code)
Air	IATA - International Air Transport Association Dangerous Goods Regulation (DGR)
UN Number	1093
UN Proper Shipping Name	ACRYLONITRILE, STABILIZED
Transport hazard class(es)	3 (6.1)
Packing group	I
Hazardous to the environment	Dangerous for the environment.
Special precautions for user	There is no need of special precautions.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International

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Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006.

- International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

**SECTION 15: REGULATORY INFORMATION**

Regulations for chemical products

Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.

**SECTION 16: OTHER INFORMATION**

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

Revised and adequate in april 2021.

Subtitles and abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service



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EC<sub>50</sub> – Effective concentration 50%LC<sub>50</sub> – Lethal concentration 50%LD<sub>50</sub> – Lethal dose 50%

IARC – International Agency for Research on Cancer

IDLH – Immediately Dangerous to Life or Health

K<sub>ow</sub> – Octanol/Water Partition Coefficient

NOEC – No Observed Effect Concentration

STEL – Short Term Exposure Limit

TLV – Threshold Limit Value

TWA – Time Weighted Average

## References:

ACGIH. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Cincinnati-USA, 2020.

GHS. Globally Harmonized System of Classification and Labelling of Chemicals. 8. rev. ed. New York: United Nations, 2015.

SDS. Safety Data Sheet. Acrylonitrile. COMPANHIA BRASILEIRA DE ESTIRENO. Versão: 9. Data: 19.06.2020.