

## SAFETY DATA SHEET

**Product:** SODIUM CYANIDE SOLUTION

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**SECTION 1: IDENTIFICATION**

Identification of the product	SODIUM CYANIDE SOLUTION.
Recommended use of the chemical and restrictions on use	Industrial use.
Company	PROQUIGEL QUÍMICA S/A.
Address	Rua Hidrogênio, 2200 - Polo Petroquímico – Camaçari – BA - CEP: 42.810-000, Brazil.
Telephone number	55 (71) 3878-6313.
Company	PROQUIGEL QUÍMICA S/A.
Address	Fazenda Caroba s/n, Candeias - BA - CEP: 43.813-300, Brazil.
Telephone number	55 (71) 3878-6633.
Emergency telephone number	0800 110 8270 Pró-Química.

**SECTION 2: HAZARD IDENTIFICATION**

Classification of the substance or mixture	Corrosive to metals – Category 1
	Acute toxicity – Oral – Category 2
	Acute toxicity – Dermal – Category 1
	Acute toxicity – Inhalation – Category 2
	Skin corrosion/irritation – Category 2
	Serious eye damage/eye irritation – Category 2A
	Specific target organ toxicity (repeated exposure) – Category 1
	Hazardous to the aquatic environment – Short-term (acute) hazard – Category 1
Hazardous to the aquatic environment – Short-term (chronic) hazard – Category 1	
Classification system adopted	Globally Harmonized System of Classification and Labelling of

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Chemicals (GHS), United Nations, 2019.

Other hazards which do not result in classification

The product does not have other hazards.

Adequate labeling elements

Pictograms



Signal word

**DANGER**

Hazard statement(s):

H290 May be corrosive to metals.  
 H300 Fatal if swallowed.  
 H310 Fatal in contact with skin.  
 H315 Causes skin irritation.  
 H319 Causes serious eye irritation.  
 H330 Fatal if inhaled.  
 H372 Causes damage to thyroid through prolonged or repeated exposure.  
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):

**PREVENTION:**

P234 Keep only in original packaging.  
 P260 Do not breathe mist, vapours and spray.  
 P262 Do not get in eyes, on skin, or on clothing.  
 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.  
 P273 Avoid release to the environment.  
 P280 Wear protective gloves, protective clothing, eye

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protection and face protection.

P284 In case of inadequate ventilation, wear respiratory protection

**RESPONSE:**

P301 + P316 IF SWALLOWED: Get emergency medical help immediately.

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

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.

P316 Get emergency medical help immediately.

P320 Specific treatment is urgent.

P321 Specific treatment.

P330 Rinse mouth.

P332 + P317 If skin irritation occurs: Get medical help.

P337 + P317 If eye irritation persists: Get medical help.

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

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

P390 Absorb spillage to prevent material damage.

P391 Collect spillage.

**STORAGE:**

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

P405 Store locked up.

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P406 Store in a corrosion resistant or container with a resistant inner liner.

**DISPOSAL:**

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

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

## MIXTURES

General information Sodium Cyanide Solution.

Ingredients or impurities contributing to the hazard

Component	Concentration (%)	CAS Number
Sodium cyanide	33,0 – 35,0	143-33-9
Sodium hydroxide	1,0 – 1,5	1310-73-2

**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 15-20 minutes. Remove contact

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	<p>lenses, if present and easy to do. If eye irritation persists: Get medical advice/attention. Take this SDS.</p>
Inhalation	<p>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.</p>
Most important symptoms/effects, acute and delayed	<p>Fatal if swallowed, in contact with skin and if inhaled. Causes skin irritation with redness, pain and dryness. Causes serious eye irritation with redness and pain. Causes damage to thyroid through prolonged or repeated exposure.</p>
Indication of immediate medical attention and special treatment needed, if necessary	<p>Along with this MSDS, consult a detailed medical protocol on the treatment of cyanide poisoning.</p> <p>Avoid contact with the product to help the victim.</p> <p>If there is contact of the product with the skin or victim's clothing, remove them immediately and wash with plenty of water.</p> <p>If the victim shows symptoms, antidotes may be needed. Administer according to clinical condition:</p> <p><b>Oxygen</b> – Offer a 100% concentration when possible.</p> <p><b>Amyl nitrite</b> – 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.</p> <p><b>Sodium Nitrite</b> – Start administer intravenously 50 g sodium nitrite, with average dose for treatment 300 mg, shall not pass 600 mg.</p> <p><b>Sodium Thiosulfate</b> – Start administer intravenously 12,5 g sodium thiosulfate, shall not pass 175 g.</p> <p><b>Cianokit (Hidroxicobalamina)</b> – Start administer intravenously 5 g of hydroxycobalamine, shall not pass 10 g.</p>

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**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:

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	Suitable: Compatible with chemical powder. Not recommended: Water jets directly and carbon dioxide (CO2).
Specific hazards arising from the	The combustion of the chemical products or containers may

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chemical	form toxic and irritating gases such as carbon monoxide and dioxide.
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	Isolate spills from sources of ignition. Evacuate the area within a radius of at least 50 meters. Keep unauthorized persons away from the area. Stop the leak if it can be done without risk. 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, waterproof neoprene, butyl rubber or polyethylene gloves, suitable protective clothing and boots. Respiratory protection masks with adequate filter.
Environmental precautions	Avoid that the spilled material reaches waterways or sewage system.
Methods and materials for containment and cleaning up	Do not allow water to enter the containers. 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 and remove them to a safe place. For final destination, proceed pursuant to Section 13 of this SDS.

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**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

It is not expected that the product presents a fire or explosion hazard.

Adequate conditions

Store in a well ventilated place away from sunlight. Keep container closed. Keep stored at room temperature. It is not necessary the addition of stabilizers and antioxidants to ensure the durability of the product. This product may react dangerously with some incompatible materials as highlighted in Section 10.

Packaging compatibilities

Similar to the original packaging.

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

## Control parameters



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Occupational exposure limit	<b>Common or common name</b>	<b>TLV – C (ACGIH, 2020)</b>
	Acetone cyanohydrin	5 mg/m <sup>3</sup>
	Sodium hydroxide	2 mg/m <sup>3</sup>
Biological limit:	Not established.	
Other limits and values	Information related to: - Sodium cyanide (cyanides) <b>IDLH (NIOSH, 2017):</b> 25 mg/m <sup>3</sup> (as CN) - Sodium hydroxide <b>IDLH (NIOSH, 2017):</b> 10 mg/m <sup>3</sup>	
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 neoprene, butyl rubber or polyethylene gloves, suitable protective clothing and boots.	
Respiratory protection	Respiratory protection masks with adequate filter. 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.	
Thermal hazards	No specific IPE's are necessary since the product does not show thermal hazards.	

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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Physical state	Liquid.
Colour	Pink to red aspect.
Odour	Characteristic.
Melting point/freezing point	562°C.
Boiling point or initial boiling point and boiling range	1496°C.
Flammability	Not available.
Lower and upper explosion limit /flammability limit	Not available.
Flash point	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
pH	Aproximately 11.0 (aqueous solution 5 g/L).
Kinematic viscosity	Not available.
Solubility	Completely miscible in water.
Partition coefficient n-octanol/water (log value)	Information related to: - Sodium cyanide log kow: -0.25
Vapour pressure	0.10 kPa at 800°C.
Density and/or relative density	1.6 at 20°C.
Relative vapour density	1.6 at 20°C.
Particle characteristics	Not available.

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Other information

Not applicable.

**SECTION 10: STABILITY AND REACTIVITY**

Reactivity and chemical stability	Product not reactive. The product is stable under normal conditions of storage and use.
Possibility of hazardous reactions	It may react with acids, with release of hydrocyanic acid, which may form explosive mixtures with air. May be corrosive to metals.
Conditions to avoid	High temperatures and contact with incompatible materials.
Incompatible material	Oxidizing agents, acids, water and carbon dioxide.
Hazardous decomposition products	Contact with acids, water, carbon dioxide or oxidants may produce toxic gases, such as hydrocyanic acid and nitrogen oxides.

**SECTION 11: TOXICOLOGICAL INFORMATION**

	Fatal if swallowed, in contact with skin and if inhaled.
	ATEmix (Acute Toxicity Estimate)
	ATEmix (oral): 14.54 mg/kg
	ATEmix (dermal): 21 mg/kg
	ATEmix (inhalation, 4h): 0.10 mg/L
	Information related to:
	- Sodium cyanide
	LD50 (oral, rats): 5.09 mg/kg
	LD50 (dermal, rabbits): 7.35 mg/kg
	LC50 (Inhalation, rats, 4h): 0.036 mg/L
Acute toxicity	
Skin corrosion/irritation	Causes skin irritation with redness, pain and dryness.

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	Information related to: - Hidróxido de sódio Studies demonstrate to cause corrosion to rabbit skin.
Serious eye damage/irritation	Causes serious eye irritation with redness and pain. Information related to: - Hidróxido de sódio Studies demonstrate to cause corrosion in rabbit eyes.
Respiratory or skin sensitization	Based on available information, the classification criteria have not been met.
Germ cell mutagenicity	Based on available information, the classification criteria have not been met.
Carcinogenicity	Based on available information, the classification criteria have not been met.
Reproductive toxicity	Based on available information, the classification criteria have not been met.
STOT - Single exposure	Based on available information, the classification criteria have not been met.
STOT - Repeated exposure	Causes damage to thyroid through prolonged or repeated exposure. Information related to: - <u>Sodium cyanide</u> Animal studies have demonstrated that repeated exposure can cause damage to the endocrine system by preventing the thyroid's absorption of iodine, acting as a goitrogenic agent.
Aspiration hazard	Based on available information, the classification criteria have not been met.

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**SECTION 12: ECOLOGICAL INFORMATION**

Ecotoxicity	Very toxic to aquatic life with long lasting effects. Information related to: - <u>Sodium cyanide</u> LC50 (Gasterosteus aculeatus, 96h): 0.099 mg/L EC50 (Pseudokirchneriella subcapitata, 72h): 0.116 mg/L
Persistence and degradability	Due to the lack of data, it is expected that the product presents persistence and it is not considered readily biodegradable.
Bioaccumulative potential	It has low bioaccumulative potential in aquatic organisms. Information related to: - Sodium cyanide log kow: -0.25
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**

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Road	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
UN Number	1935
UN Proper Shipping Name	CYANIDE SOLUTION, N.O.S. (Sodium cyanide)
Transport hazard class(es)	6.1
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	1935
UN Proper Shipping Name	CYANIDE SOLUTION, N.O.S. (Sodium cyanide)
Transport hazard class(es)	6.1
Packing group	I
Sea	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN Number	1935
UN Proper Shipping Name	CYANIDE SOLUTION, N.O.S. (Sodium cyanide)
Transport hazard class(es)	6.1
Packing group	I
Marine pollutant	The product is considered a marine pollutant.
EmS	F-A, S-A
Air	IATA - International Air Transport Association Dangerous Goods Regulation (DGR)
UN Number	1935
UN Proper Shipping Name	CYANIDE SOLUTION, N.O.S. (Sodium cyanide)
Transport hazard class(es)	6.1
Packing group	I

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Environmental hazard:	The product is considered environmentally hazardous.
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: <ul style="list-style-type: none"><li>- International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006.</li><li>- 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.</li></ul>

**SECTION 15: REGULATORY INFORMATION**

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

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## Subtitles and abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

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, 2019.

SDS. Safety Data Sheet. SODIUM CYANIDE SOLUTION. PROQUIGEL QUÍMICA. Versão: 6. Data: 22/10/2019.