SAFETY DATA SHEET

Product: NITROGEL PREMIUM

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SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification of the product	NITROGEL PREMIUM.
Recommended uses	Used in the manufacture of industrialized products, including ARLA 32.
Restrictions on use	Not recommended for other uses.
Company	Proquigel Química S/A.
Address:	Rua Eteno, n° 2198 – Polo Industrial de Camaçari - Camaçari/BA, CEP: 42.816-200, Brazil.
Telephone number	55 (71) 3483-5022.
Emergency telephone number	0800 110 8270 Pró-Química.

SECTION 2: HAZARDS IDENTIFICATION

Most important hazards	Causes skin irritation. Causes serious eye irritation.
Product effects	
Adverse effects to the human health	Causes skin irritation. Causes serious eye irritation.
Environmental effects	It is not expected that product presents environmental effects.
Physical and chemical hazards	It is not expected that product presents physical and chemical hazards.
Chemical product-specific hazards	It is not expected that product presents specific hazards.
Important symptoms	Redness and dryness in the skin. Redness and tearing in the eyes.
Classification of the chemical product	Skin corrosion/irritation – Category 2. Serious eye damage/eye irritation – Category 2A.
Classification system adopted	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations, 2019.

Adequate labeling elements	
Pictograms	
Signal word	WARNING
Hazard statement(s)	H315 Causes skin irritation. H319 Causes serious eye irritation.
Precautionary statement(s)	P264 Wash hands thoroughly after handling. P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection. P302 + P352 OF ON SKIN: Wash with plenty of water. P332 + P313 If skin irritation occurs: Get medical help. P337 + P313 If eye irritation persists: Get medical help. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water several minutes. Remove contact lenses, if present and easy to do. Continue rising.
Outline of an anticipated emergency	LIQUID HAZARDOUS TO HUMAN HEALTH.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	
Systematic chemical or trivial name	Urea
Common or generic name	Carbamide.
CAS Number	57-13-6.

Impurities and stabilizing additives contributing to the hazard	

Componentes	Concentration (%)	CAS Number
Formaldehyde*	≤ 0,0015%	50-00-0
Ammonia*	≤ 0,02%	7664-41-7
Biuret*	≤ 0,9%	108-19-0
Nitrogen	≥ 46%	7727-37-9

*The ingredients are hazardous; however, they are not in sufficient concentration to extrapolate the hazards to the product.

SECTION 4: FIRST-AID MEASURES

Exposure routes	
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.
Skin contact	In case of skin contact, remove all contaminated clothing immediately. Wash immediately with plenty of running water for at least 15 minutes. Wash contaminated clothing before reuse. Seek medical attention and take this SDS.
Eye contact:	Rinse thoroughly with water for several minutes. If using contact lenses, remove them if it is easy. If eye irritation persists, consult a doctor. Take this SDS.
Ingestion	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him on the left side (upward if possible) to keep the airway open and avoid aspiration. Keep the patient silent and maintain normal body temperature. Consult a TOXICOLOGY CENTER or a doctor. Take this SDS.
Anticipated acute effects and/or anticipated delayed effects	Contact with the product causes irritation to the skin with flaking and dryness, contact with the eyes causes redness, pain and watering. Inhalation of the product may cause irritation of the respiratory tract

	with coughing and sneezing, by mechanical action.
Most important symptoms/effects	Redness and dryness in the skin, tearing and redness in the eyes.
Protection of first aiders and/or special notes to a physician	Avoid contact with the product when helping the victim. Treatment of exposure should be directed towards the control of the patient's symptoms and clinical condition. In case of contact with the skin, do not rub the affected area.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	Suitable: Compatible with dry chemical powder, alcohol resistant foam, carbon dioxide (CO_2) and water fog Not recommended: direct water jets.
Specific hazards arising from the chemical product	The combustion of the chemical products or containers may form toxic and irritating gases such as carbon monoxide and carbon dioxide.
Specific extinguishing methods	Containers and tanks involved in the fire should be cooled with water laterally.
Special equipment for the protection of firefighters	Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions	Remove all sources of ignition preventively. Prevent sparks or flames. Do not touch damaged containers or spilled material without the use of appropriate clothing. Avoid inhalation, contact with skin or eyes.
Protective equipment:	Use protective equipment as described in Section 8.
Emergency procedures	It is recommended the installation of fire alarm system and leak detection in local storage and use of the product.
Environmental precautions	Prevent the product from reaching the soil and water courses. Notify the relevant authorities if the product has caused environmental pollution (if it has reached water courses or if it has contaminated the soil or vegetation).
Methods and materials for	Containment techniques may include bunding, covering of drains and

containment	capping procedures.
Methods and materials for cleaning up	Do not allow water to enter the containers. Use natural or spill containment barriers. Collect the spilled product and place in proper containers. Absorb the remaining product with dry sand, earth, vermiculite, or any other inert material. Place the adsorbed material in appropriate containers and remove them to a safe place. Use non-sparking tools to collect the absorbed material. For final destination, proceed according to Section 13 of this SDS.
Secondary disaster prevention measures	Do not dispose directly into the environment or into the sewage system. The products resulting from fire control may cause pollution.

SECTION 7: HANDLING AND STORAGE

Handling	
Precautions for safe handling	Schedule a first aid action before starting the activity with the product. The use of the product is restricted to professionals. Caution - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general local ventilation / exhaust system. Avoid exposure to the product.
Technical measures for prevention of exposure of the handler	Use personal protective equipment as described in Section 8.
Technical measures for prevention of fire and explosion	It is not expected that the product presents a fire or explosion hazard.
Suitable precautions	Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas.
Prevention of contact:	Wash hands and face thoroughly after handling and before eating, drinking, smoking, or going to the bathroom.
Storage	
Conditions for safe storage	Store in a location only accessible to authorized personnel. Store in the original container. Store the product in a tightly closed container

	and in a dry, well-ventilated place. To maintain the quality of the product, do not store it in the heat or in direct sunlight.
Technical measures	Keep away from high temperatures, ignition sources and incompatible materials.
Incompatible substances and mixtures	Calcium cyanamide, de-fluorinated phosphates, quicklime, calcined limestones, and strong oxidizing agents such as nitrites, chlorides, and inorganic perchlorates.
Packaging materials	
Recommended material	Bulk urea must be stored in a dry place, free from humidity and protected from rain, and even kept in a covered place, without the risk of contamination or alteration of its physical-chemical properties. Plastic polypropylene bags or other airtight packaging.
Unsuitable material	Packaging of other materials.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible concentration

Occupational exposure limit

Chemical or common name	TLV – TWA (ACGIH, 2020)	PEL – TWA (OSHA, 2006)	REL – TWA (NIOSH, 2010)
Ammonia	TWA 25 ppm STEL 35 ppm	50 ppm	25 ppm (ST) 35 ppm
Formaldehyde	TWA 0.1 ppm STEL 0.3 ppm	0.75 ppm (ST) 2 ppm	Ca 0.016 ppm (C) 0.1 ppm [15-min]

ST: Short Term Exposure Limit.

A1: Confirmed Human Carcinogen.

Ca: Potential occupational carcinogens.

C: Ceiling limit.

Biological limit	Not established.

Engineering controls measures	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.
Appropriate personal protective equipment	
Respiratory protection	In case of dust formation, use respiratory protection equipment against dust - P2. 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.
Hand protection	Wear gloves resistant to natural rubber or nitrile chemicals.
Eye protection	Safety goggles.
Skin and body protection	Suitable safety clothing and closed shoes. The material used should be waterproof.
Special precautions	Not established.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Solid, white in granules.
Odour	Odorless.
pH	Not applicable.
Melting point/freezing point	132.7°C.
Boiling point, initial boiling, and boiling range	The product decomposes before reaching the boiling point.
Flashpoint	Not flammable.
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	1.2×10^{-5} mmHg at 25°C.
Vapour density	45 mmHg at 20°C (solution at 50%).
Relative density	1.335 at 20°C.
Solubility(ies)	Soluble in water (50% at 17 ºC) and alcohol.

	Slightly soluble in ether.
n-octanol/water partition coefficient	Log kow: - 2.11.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Odour threshold	Not available.
Evaporation rate	Not available.
Flammability	Not flammable.
Viscosity	1.88 cP at 20 ºC (solution at 50%).
Other information	Not applicable.

SECTION 10: STABILITY AND REACTIVITY

Chemical stability	Product is stable under normal conditions of temperature and pressure.
Hazardous reactions	Reacts violently with strong oxidizers, such as nitrites, chlorides and inorganic perchlorates, causing fire and explosion. Dissolving the product in water or moisture causes endothermic reactions.
Conditions to avoid	Elevated temperatures. Ignition sources and contact with incompatible materials.
Incompatible materials	Calcium cyanamide, de-fluorinated phosphates, quicklime, calcined limestones, and strong oxidizing agents such as nitrites, chlorides, and inorganic perchlorates.
Hazardous decomposition products	Combustion of the chemical or its packaging can form carbon monoxide and carbon dioxide and oxides of nitrogen.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity	Not classified as toxic orally. The product is not expected to be toxic to the dermal and inhalation routes. Urea:

	LD_{50} (oral, rats): 14,300 mg/kg. LD_{50} (dermal, rats): 8,200 - 9,400 mg/kg.
Skin irritation/corrosion	Contact with the product causes skin irritation with flaking and dryness.
Eye damage/irritation	Contact with the eyes causes redness, pain, and watering.
Respiratory or skin sensitization	The product is not expected to cause respiratory or skin sensitization. Evaluations conducted with workers did not show the potential of urea to cause skin and respiratory sensitization.
Reproductive cell mutagenicity	The product is not expected to cause germ cell mutagenicity. *In vitro* - Ames test conducted with *Salmonella typhimurium* TA98, TA100, TA1537 showed negative results. *In vitro* - Ames test conducted with *Salmonella typhimurium* TA98, TA100, TA1535, TA1537, TA1538 and Escherichia coli WP2uvrA, showed negative results.
Carcinogenicity	The product is not expected to have a carcinogenic potential. Studies conducted with urea administered orally in rats, no carcinogenic potential was found.
Reproductive toxicity	The product is not expected to cause reproductive toxicity. Teratogenicity tests conducted with urea via oral administration in mice, did not cause toxic effects to reproduction.
Specific target organ toxicity – single exposure	Inhalation of the product may cause respiratory irritation with coughing and sneezing by mechanical action.
Specific target organ toxicity – repeated exposure	The product is not expected to cause target organ toxicity through repeated exposure. Studies conducted for 12 months in rats and mice, did not show toxic effects on target organs due to chronic exposure.
Aspiration hazard	It is not expected that the product presents aspiration hazard.
Toxicokinetics, metabolism and distribution	The primary mechanism of ammonia toxicosis appears to be inhibition of the citric acid cycle. There is an increase in anaerobic glycolysis, blood glucose, and blood lactate. Acidosis is manifested. The exact means by which ammonia blocks the citric acid cycle is not known. It

	is postulated that ammonia saturation of the glutamine-synthesizing system causes a backing-up in the citrate cycle, a decrease in its intermediates, and a decrease in energy production and cellular respiration, which leads to convulsions. The decrease of citrate cycle intermediates is postulated to result from reamination of pyruvic, ketoglutaric, and oxaloacetic acids.

SECTION 12: ECOLOGICAL INFORMATION

Environmental effects, behavior, and fate of the product	
Ecotoxicity	The product is not toxic to aquatic organisms. Urea: LC_{50} (Fish, 96h): 6,810 mg/L. LC_{50} (*Mossambic tilapia*, 96 h): 22,500 mg/L. EC_{50} (*Daphnia magna*, 48h): 10,000 mg/L. NOEC (Algae): 47 mg/L.
Persistence and degradability	The product is not expected to show persistence, it is expected to be quickly degraded. Urea: Biodegradability: 96% in 16 days (OECD Guideline 302 B).
Bioaccumulative potential	Presents low bioacumulative potencial in aquatic organisms. BCF: 1.10. Log kow: -2.11.
Mobility in soil	High soil mobility is expected. Urea: Koc: 8.
Other adverse effects	Depending on the concentration, fine particles of urea suspended in the atmosphere may cause the degradation of the foliage of the vegetables. The biuret content in urea, above 0.3%, is harmful to the health of most vegetables and can degrade the foliage. In the soil, a content above 1.5% already compromises the germination of seeds. The contact between product dust and some metals can cause oxidation, especially carbon steel. Special attention should be paid to substations located close to installations, which process or handle

	urea, since transmission lines, transformers and electrical material in general can also undergo oxidative actions of the product.

SECTION 13: DISPOSAL CONSIDERATIONS

Methods of disposal to the chemical product, product waste and/or contaminated container and/or packaging	Must be disposed of as hazardous waste in compliance with 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.

SECTION 14: TRANSPORT INFORMATION

International regulations	
Land	UN – “United Nations” Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
Sea	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
Air	IATA – International Air Transport Association Dangerous Goods Regulation (DGR)
UN number	Not classified as hazardous to transport.
Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code	Consult regulations: - 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. - 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.
Special precautions	There is no need of special precautions.

SECTION 15: REGULATORY INFORMATION

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

International Organization for Standardization - ISO 11014:2009.

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.

SDS elaborated in march, 2021.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
BCF – Bioconcentration Factor
BEI – Biological Exposure Index
CAS – Chemical Abstracts Service
C – Ceiling
LC_{50} – Lethal Concentration 50%
LD_{50} – Lethal Dose 50%
ERPG - Emergency Response Planning Guidelines
LEL – Lower Explosive Limit
UEL – Upper Explosive Limit
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average

Bibliographic 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.

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