



USIQUÍMICA

SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

1. - IDENTIFICATION OF PRODUCT AND COMPANY

Product name: Urea solution at 45%.

Internal Code of product identification: 182.01.0.

Company name: Usiquímica do Brasil Ltda.

Address: Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.

Company Phone: (11) 3821-7000 (PBX system) - (11) 2481-3355.

Emergency call numbers: SUATRANS - COTEC - Environmental Emergency.

DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.

193 - Firefighters.

Main recommended uses for the substance: In chemical, textile, cosmetic and pharmaceutical industries, as a biological nutrient in effluents and in agriculture as a source of nitrogen.

2. - HAZARDS IDENTIFICATION

Substances classification

Corrosive/irritation to skin- Category 5

Serious eye damage / eye irritation - Category 5

EFFECTS OF PRODUCT:

Adverse effects to the human health: Adverse to health effects are considered unlikely.

Inhalation: Inhalation of the solution produces nose irritation, throat and upper respiratory tract. It can trigger sneezing and coughing.


Eye contact: Causes irritation with redness, lacrimation and pain.

Skin contact: It has an irritating effect producing itching and local redness.

Ingestion: Ingestion of the product may cause gastrointestinal irritation. Nausea, vomiting, abdominal pain and diarrhea may appear when ingesting larger quantities of the product.

Environmental effects: The product is not expected to present a hazard to the environment

GHS LABELING ELEMENTS, including precautionary phrases:

LABELING ELEMENTS	DATA
Product identification and supplier emergency phone.	Commercial Name: Urea solution at 45%. Synonym: Carbamide, carbonyl diamide, carbonic acid diamide. Emergency call number: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 hours.
Chemical composition.	High purity urea: 45%. High purity water: 55%.
Hazard pictogram.	
Warning words.	ATTENTION
Hazard phrase.	H317 - May cause allergic skin reactions. H320 - Causes eye irritation.
Caution Phrases.	P280 - Use protective gloves/protective clothing/eye protection/face shield. P303+P361+P353 IN CASE OF SKIN CONTACT (or with the hair), remove them immediately all contaminated clothing. Rinsing the skin with water/take a shower. P304+P340+P310 IN CASE OF INHALATION - Remove the person to a ventilated area and keep it in a rest position that does not make it difficult to breathe. Please Immediately contact a TOXICOLOGICAL INFORMATION CENTER/physician. P305 + P351 + P338 + P310 IN CASE OF EYES CONTACT - Rinse cautiously with water for several minutes. In the case of contact



SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

	lenses, remove them if easy. Continue rinsing. Please Immediately contact a TOXICOLOGICAL INFORMATION CENTER/physician. P308 + P311 IN CASE OF exposure or suspected exposure: - Please contact a TOXICOLOGICAL INFORMATION CENTER / physician.
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Other hazards which do not result in classification: Not known.

3. - COMPOSITION AND INFORMATION ON THE INGREDIENTS:

Substance: 45% aqueous urea solution - $(\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$.

Chemical or common name: Aqueous solution of urea - $(\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$.

Synonym (for urea): Carbamide, carbonyl diamide, carbonic acid diamide. **No.**

CAS (Chemical Abstract Service): CAS: 57-13-6.

Impurities that contribute to the hazard: Unidentified.

4. - FIRST AID MEASURES:

First aid measures:

Inhalation: Remove the victim to an uncontaminated and ventilated area. If you are breathing hard, administrating oxygen. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Immediately forward to the nearest hospital.

Skin contact: Remove clothing contaminated by the product. Wash the victim's mouth with plenty of water. If irritation persists, seek to physician.

Eye contact: Wash at once the eyes under running water for 15 minutes, lifting the eyelids to allow maximum product removal. Refer to the physician.

Ingestion: If a large amount of this substance is ingested, see to physician immediately.

What actions must be avoided: Do not induce vomiting. If vomiting occurs spontaneously, the victim shall be lying on his side to prevent pulmonary aspiration. Never administer liquids to unconscious victims.

Brief description of the main symptoms and effects: May cause irritation of the respiratory system if dust is inhaled. It can cause eye irritation, which must stop after removing the product. In case of prolonged exposure to the product, skin irritation is possible.

Notes to the physician: Avoid contact with the product to help the victim. Keep the victim on standing and heated. Do not give anything by mouth to an unconscious person. Symptomatic treatment must include, mainly, supportive measures such as correction of hydro electrolytic, metabolic disorders, as well as respiratory assistance. In case of contact with the skin and/or eyes, do not rub the affected parts.

5. - FIRE FIGHTING MEASURES

Extinguishing measures appropriate: The solution does not present a fire risk. Use appropriate measures to combat the fire in the surrounding area.

Not appropriate extinguishing measures: water jet.

Other relevant information: If water is used, restrict pedestrian and vehicle traffic in areas where there is a risk of slipping.

Specific hazards: When heated, the urea solution decomposes to carbon dioxide (CO_2) and ammonia (NH_3). When burned, it emits nitrogen oxides (NO_x). In high blood concentrations, urea increases the risk of glaucoma. The reaction of urea with nitrates presents the risk of fire and explosion. Urea is not a fuel, but it decomposes at temperatures above 133°C to form toxic vapors.

Additional information: The danger depends on the burning products and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official local legislation.

fire fighter protection: Special protective equipment for personnel deployed for firefighting. Do not stay in the danger zone without self-contained breathing apparatus suitable for breathing independently of the environment. To avoid contact with the skin, keep a safe distance and wear suitable protective clothing. Refresh closed containers exposed to fire with sprayable water. Suppress (throw) with water jets (fog) the gases, vapors and mists. Avoid to contamination of surface water and groundwater with water to firefighting.

6. - MEASURES OF CONTROL FOR SPILL OR LEAK

Personal precautions, protective equipment and emergency procedures:



SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

For the staff that is not part of the emergency services.

Removal ignition sources: Keeping away from sources of heat and ignition. Urea It presents a of decomposition risk when exposed to heat or flame.

Prevention of inhalation and contact with skin, mucous membranes and eyes: Please see Section 8, Field: "Appropriate personal protective equipment".

For the staff of the emergency department: Using complete PPE, with PVC protective gloves, safety glasses with side protection and appropriate protective clothing. The material used must be waterproof. In case of large leaks, where exposure is large, it is recommended to use a protective mask with a filter against vapors or mists.

Precautions to the environment: Avoid to spilled product reaching watercourses. Collect the spilled product, adsorb the remaining product with inert material, place the material in appropriate containers for proper final disposal.

Methods and materials for containment and cleaning: Use water fog or vapor suppressing foam to reduce dispersion of vapors. 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 absorbed material in appropriate containers and remove them to a safe place.

7. - HANDLING AND STORAGE

Handling:

Technical measures: Use only in areas provided with adequate exhaust ventilation. Providing the product handling area with emergency shower set and eye wash. Handling must only be done with the indicated PPEs and under safe conditions.

Prevention of worker's exposure: Avoid a formation of vapors / aerosol. Working with exhaust / chimney. Do not inhale the substance / mixture. Wear specific PPEs - splashes glasses, face shield, PVC gloves and protective clothing. To avoid inhaling vapors.

Washing after handling and decontaminate PPEs after use. The PPEs must be approved for use only with the respective CAs - Certificates of Approval.

Precautions and guidelines for safe handling: Use personal protective equipment (PPE) to avoid direct contact with the product. Handling the product in a well-ventilated place. Forms a slippery layer with water.

To avoid any change in product quality during storage and transport, the following physical conditions should be met:

- A storage temperature below 30 ° C is recommended.
- A storage temperature above - 11 ° C is recommended to avoid crystallization of the product, which occurs from - 11.5 ° C.
- Protect from sunlight to prevent algae.
- Use tightly closed containers to protect both the container and the product from any contaminating agent. Prolonged storage at a temperature above 30 ° C will cause hydrolysis, which leads to the formation of ammonia and increased pressure, and will shorten the product's life.

The urea solution must be transported in isolated tanks or plastic containers.

Special shipping information: fractional packages must be transported in a safe position in a well-ventilated vehicle. Fractionated packaging transported in an unventilated vehicle compartment can present safety risks.

Storage:

Appropriate: Keep the container hermetically sealed in a dry, cool and well-ventilated area. Storing in a cool, dry place in unopened original packaging. Avoid to humid, wet and slightly wet conditions, extremes of temperature and sources of ignition.

To be avoided: Avoid extreme heat. Highly reactive or incompatible with oxidizing materials, acids and alkalis.

Hygiene measures:

Appropriate: Always sanitize the hands before handling any food, as there is a risk of contamination of the food. Contaminated clothing must be washed and sanitized before the use. Keeping gloves free from moisture and decontaminated.

Inappropriate: Direct contact with the product and / or its residues.

Technical measures:



USIQUÍMICA

SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

Adequate conditions: Keeping containers closed and in a well-ventilated place. Keep containers protected from heat and direct sunlight. Avoid extreme temperatures. Avoid to moisture.

Packaging safe materials: Recommended: Original material.

8. - EXPOSURE CONTROLS AND INDIVIDUAL PROTECTION

Control parameters:

Occupational exposure limits:

For urea: AIHA WEEL: 10 mg / m³ (8 am, TWA).

Biological indicators: Not found.

Other limits and values: N.A.

Measures of engineering control: Handling the product in a location with good natural or mechanical ventilation, in order to keep the concentration of vapors / dust below the tolerance limit. Promote mechanical ventilation and a direct exhaust system to the outside environment. These measures help to reduce product exposure. It is recommended to make emergency showers and eye washers available in the work area. Engineering control measures are the most effective in reducing product exposure.

Appropriate personal protective equipment:

Adequate respiratory safety equipment in case of low concentrations or short term exposure: Medium efficiency filter for solid and liquid particles.

Hand protection: Chemical resistant gloves.

Eye Protection: Safety glasses with side-shields (glasses with frames).

Protection of the skin and body: Light clothing to protect.

Hygiene measures: Hands and face must be washed before breaks and at the end of the shift. Remove immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Physical condition: Liquid.

Form: Not applicable.

Color: Colorless.

Odor: No smell or a slight smell of ammonia.

pH: close to 9.8 (45% in water).

Crystallization point: -11.5 ° C, approximately.

Boiling point: 132.7°C (literature data).

Flash point: Not applicable.

Evaporation rate: Not applicable.

Flammability: Non-flammable.

Upper / lower explosive or flammable limits: Not applicable.

Vapor pressure: Not applicable.

Vapor density: Not applicable.

Density: 1117.0 - 1126.0 kg/m³.

Solubility (urea in water): Unlimited.

Solubility (urea in ethanol): 72 g/1000 mL (30°C).

Partition coefficient octanol / water: Not applicable.

Auto-ignition temperature: Not applicable.

Decomposition temperature (urea): 142°C.

Viscosity: Unknown.

Thermal Conductivity (at 25 ° C): 0.570 W / m K approx.

Specific heat (at 25 ° C): 3.40 kJ / kg K approx.

Superficial tension: min. 65 mN / m.

Other information:

Molecular weight: 60.06 g / mol (urea).

18 g / mol (water).

31.5 g / mol (32% solution)



USQUÍMICA

SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

10. - STABILITY AND REACTIVITY

Specific conditions:

Reactivity: Urea reacts violently with gallium perchlorate. Reacts with chlorine to form chloramines. Urea also reacts with sodium hypochlorite, sodium nitrate, calcium hypochlorite, sodium nitrite, strong oxidizing agents (permanganate, nitrate, dichromate, chloride).

Chemical stability: Product is stable under normal condition. In the presence of heat, urea becomes unstable and decomposes. It does not polymerize.

Conditions to be avoided: High temperatures and contact with incompatible products.

Materials or incompatible substances: Urea can be slightly corrosive to steel, aluminum, zinc and copper.

Hazardous decomposition products: Urea decomposes under heat and can form products such as: ammonia, nitrogen oxides, cyanuric acid, cyanic acid, biuret and carbon dioxide.

11. - TOXICOLOGICAL INFORMATION

Acute Toxicity: Contact with urea solution at 45% 45% may cause irritation to the respiratory tract and eyes.

Corrosion/irritation of skin: Causes irritation with redness, pain and dryness.

Severe ocular lesions/eye irritation: It can cause irritation with lacrimation and pain.

Respiratory or skin sensitization: Contact prolonged and may cause irritation.

Germ cell mutagenicity: It has no mutagenic effect.

Carcinogenicity: It has no carcinogenic effect.

Reproductive toxicity: Not classified for reproductive toxicity.

Toxicity to organs - specific targets - single exposure: Ingestion in large quantities can cause damage to the gastrointestinal tract and pain in the abdomen.

Toxicity to organs - specific targets - repetitive exposure: Repeated exposure can cause irritation to the respiratory tract.

Aspiration hazard: It may cause coughing or light irritation in the throat.

12. - ECOLOGICAL INFORMATION

Environmental effects, behaviors and impacts of the product:

Ecotoxicity: The product is not expected to present a hazard to aquatic organisms. CL_{50} (fish, 96 h): > 9.100 mg/L. CE_{50} (daphnia, 24 h): > 10.000 mg/L.

Persistence and degradability: Substantially biodegradable in soil and water. Values not found.

Bio accumulative potential: Low potential for bioaccumulation. Log Pow <1.

Mobility in soil: urea soluble in water. Values not found.

Additional information

Other adverse effects: In case of spill, the product must be collected. Falling product into streams and rivers must be avoided. In this case, report the fact immediately to the environmental control body in the region.

13. - CONSIDERATION ON THE FINAL DISPOSAL

Recommended methods for final destination:

The treatment and disposal of product wastes must be carried out in an appropriate environment, by people trained with the use of special equipment and the recommended PPE's to avoid contact with the product, its vapors or mists. Leaks must be contained and collected for later disposal after neutralization.

Product:

Ensure that all Federal, State and local agencies receive appropriate notices of spills and disposal methods. CONAMA Resolution 005/1993, Law No. 12,305, of August 2, 2010 (National Policy on Solid Waste).

Waste of products:

Please consult environmental regulatory agencies for counselling on the acceptable disposal practices. Please contact the relevant local authorities. It can be incinerated when in compliance with local regulations. Or dispose of at an approved chemical waste landfill.

- Used Package:

Empty packages must be drained and covered before handling and transport operations. If the packaging is not conveniently washed and decontaminated, it is considered to contain product.



SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

14. - TRANSPORT INFORMATION

National and International Regulations

Land:

Resolution No. 5232 of as Wednesday, December 14, 2016 of the National Land Transport Agency (ANTT), *Approves the Supplementary Instructions to the Regulation for the Land Transportation of Dangerous Products and their modifications.*

ONU number: Product not classified by the Legislation in force on the o transport of dangerous products.

Appropriate name for shipment: -

Risk class: -

Risk subclass: -

Risk number: -

Packaging group: -

Waterway:

DPC - Directorate of Ports and Coasts (Transport in Brazilian waters) Maritime Authority Standards (NORMAM)

NORMAM 01 / DPC: Vessels Employed in Open Sea Navigation

ONU number: Product not classified by the Legislation in force on the o transport of dangerous products.

Appropriate name for shipment: -

Risk class: -

Risk subclass: -

Risk number: -

Packaging group: -

Air:

ANAC - Civil Aviation National Agency - Resolution No. 129 of as 8 January, 2009

RBAC No. 175 - (BRAZILIAN CIVIL AVIATION REGULATION) - TRANSPORT OF DANGEROUS MATERIALS IN CIVIL AIRCRAFT

IS No. 175-001 - SUPPLEMENTARY INSTRUCTION - IS

ICAO - "International Civil Aviation Organization" - Doc 9284-NA / 905

IATA - "International Air Transport Association" Dangerous Goods Regulation (DGR)

ONU number: Product not classified by the Legislation in force on the o transport of dangerous products.

Appropriate name for shipment: -

Risk class: -

Risk subclass: -

Risk number: -

Packaging group: -

15. - INFORMATION ON THE REGULATIONS

Specific regulations for the chemicals:

Federal Decree No. 2,657 of as July 3, 1998;

Standard ABNT-NBR 14725:2014;

Ordinance No. 229, of as May 24, 2011 - Amends Regulatory Standard No. 26.

16- OTHER INFORMATION

The information in this sheet corresponds to the current status of our knowledge and our product experience and is not exhaustive. Applies to the product under the conditions specified, unless mention otherwise. In case of combinations or mixtures, make sure that no new hazards can appear. This information does not exempt, in any case, the user of the product from respecting the all legislative, regulatory and administrative texts related to the product, safety, hygiene and protection of human and environmental health.

Bibliographical References:

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the "Documentation" dos Limites de Exposição Ocupacional (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Brazilian Association of Occupational Hygienists Translation. São Paulo, 2016.

BRAZIL. MINISTRY OF LABOR AND EMPLOYMENT (MTE) Regulatory Standard (NR) No. 7: Control program



USQUÍMICA

SAFETY DATA SHEET FOR CHEMICALS
MSDS

UREA SOLUTION AT 45%

REVISION DATE: 7/2/2018

physician occupational health. Brasília, DF. Jun. 1978.

BRAZIL. MINISTRY OF LABOR AND EMPLOYMENT (MTE) Regulatory Standard (NR) No. 15: Atividades e operações insalubres. Brasília, DF. Jun. 1978.

EPA of USA. 2011. EPI Suite™ for Microsoft® Windows, v 4.10. United States: Environmental Protection Agency, Washington. 2011. Available at:

< <http://www.epa.gov/oppt/exposure/pubs/episuite.htm>>. Access on: June, 2018.

Globally Harmonized System of Classification and Labelling of Chemicals (GHS). 7. rev. United Nations, 2017.

HSDB - HAZARDOUS SUBSTANCES DATA BANK. Available at: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>>. Access on: June, 2018.

IARC - INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available at:

<<http://monographs.iarc.fr/ENG/Classification/index.php>>. Access on: June, 2018.

IPCS - INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY - INCHEM. Available at: <<http://www.inchem.org/>>. Access on: June, 2018.

IUCLID - INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE. [S.I.]: European chemical Bureau. Available at: <<http://ecb.jrc.ec.europa.eu>>. Access on: June, 2018.

NIOSH - NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available at:

<<http://www.cdc.gov/niosh/>>. Access on: June, 2018.

NITE-GHS JAPAN - NATIONAL INSTITUTE OF TECHNOLOGY AND EVALUATION. Available at:

<http://www.safe.nite.go.jp/english/ghs_index.html>. Access on: June, 2018.

U.S. ENVIRONMENTAL PROTECTION AGENCY. ECOSAR - Ecological Structure-Activity Relationships. Versão 1.11.

Available at: <<http://www.epa.gov/oppt/newchems/tools/21ecosar.htm>>. Access on: June, 2018.