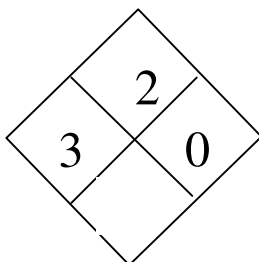


RISK DIAMMOND**Fire 2 – risk with light heating****Health 3 – very hazardous****Reaction risk 0 – no risk under normal conditions**

Revision item 3, hazards identification; item 7, storage; item 9, PH; item 10 stability and reactivity; item 11, toxicological data; item 12 revision ecotoxicity, insertion of Henry Law Constant and Partition Coefficient octanol/water; item 15, insertion of EPA data; item 16, updating bibliographical references.

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name (label): **Urea Formaldehyde Concentrate.**
- Name in English: Urea Formaldehyde Concentrate.
- Supplier name, address and telephone number:
Elekeiroz S.A. (Várzea Paulista-SP Unit) - Rua Dr. Edgardo de Azevedo Soares, 392
CEP 13224-030
Phone: **(0xx11) 4596-8800 (24 h)**. Fax: (0xx11) 4596-8881
Elekeiroz S.A. (Camaçari-BA Unit) - Rua João Úrsulo, 1261, Pólo Petroquímico do Nordeste
CEP 42810-000
Phone: **(0xx71) 3632-7711 (24 h)**
Fax: (0xx71) 3632-2110
E-mail (customer service):
elisabete.moskalenko@elekeiroz.com.br
carlos.villani@elekeiroz.com.br

2. COMPOSITION AND INFORMATION ABOUT INGREDIENTS

- Common chemical name of the substance:
Urea Formaldehyde Concentrate.
- Synonyms:
Formaldehyde Stabilized with Urea
- Register in *Chemical Abstract Service* (nº C.A.S):
[50-00-0]
- Ingredients that contribute to hazard:
Formaldehyde (50 to 51%), nº C.A.S.: 50-00-0

3. HAZARDS IDENTIFICATION

- Hazards and most important effects:
Colorless liquid, irritant, suffocating odour. Corrosive to eyes, skin and respiratory tract.
Can cause skin sensitization.
Chronic effects: dermatitis, damages in kidneys.
Classified by ACGIH as Group A2: suspect human carcinogenic.
Classified by IARC as human carcinogenic (Group 1).

4. FIRST AID MEASURES

- Inhalation:
Remove the victim to fresh air and keep him/her laid/deitada. If he/she is not breathing, apply artificial respiration by qualified person.
- Contact with skin:
Wash the skin with plenty of water (15 minutes) and soap, while contaminated clothing are removed.
- Contact with eyes:
Wash the eyes with plenty of water (15 minutes), including under eyelids. Remove contact lenses, if it is the case, with medical help. Consult an oculist physician.
- Ingestion:
Drink water or milk immediately, if the victim is conscious.
- Observation: in all cases, the victim should be sent to emergency medical assistance.
- Information to physician:
Take into consideration the risk of pulmonary edema due to substance inhalation. Use corticoestheroids since the beginning.
The ingestion of the substance leads to fixation risk in the tissue of vocal cord with possible perforation within the first three days. Give a careful wash with an isotonic solution of sodium chloride and activated carbon.
Administer (via probe), from 100 to 150 ml of carbamic acid solution/ácido carbâmico at 20% to form a non-poisonous combination.
Treat the victim affected by acidosis due to anion absence and simulatneously monitor the level of methanol in the blood.
Formic acid quickly metabolized requires attention: treat for acidosis and use dialysis to remove formic acid.
Causes severe damages to tissues.

5. FIREFIGHTING MEASURES

- Extinguishing media:
Alcohol foam, dry powder and CO₂.
- Specific hazards:
Liquid combustible, normally, there is no risk of fire. When heated, flammable gases evaporate, forming a possible explosive mixture with air. Explosion range is from 7 to 73%. Flash point of the solution of Urea Formaldehyde Concentrate decreases as the methanol concentration increases.
- Special methods / firemen protection:
For large fires, the use of alcohol foam and cooling with water fog are recommended. The personnel involved in firefighting should wear self-contained breathing apparatus and full protection clothing.

6. CONTROL MEASURES FOR SPILLS AND LEAKAGES

- Personal precautions:
Remove ignition sources. Isolate the area. Approach the incident area for containment and/or cleaning with adequate PPE's (see item 8). Prevent gases inhalation and contact with skin, mucous membranes and eyes. Dust control not applicable.
- Environmental precautions:
Contain the spill with sand dikes or specific accessories, avoid gases releasing to the environment.
- Cleaning methods:
Do not use tools or equipment which generate sparks. Absorb the material with sand or other absorbant material and dispose in polyurethane containers for later disposal or recycling. The material can be dissolved or mixed with combustible solvent and burnt in chemical burner, properly regulated.

7. HANDLING AND STORAGE

- Handling:
Prevent contact with eyes and skin. Do not inhale the vapours. Keep containers closed and sealed. Use exhaustion (explosion proof) in the area where the material is handled. Electrical installations in the area should be explosion proof. It is necessary eye washing fountains and emergency shower in handling area. Wear adequate PPE's (see item 8).
- Fire and explosion prevention:
Be careful with flames, sparks and welding. Prevent sparks formation resulting from static electricity.

- Proper material for package: Polyethylene.
- Storage:
304 stainless steel or fiberglass with polyesther resin tanks, at temperature from 20 to 35°C. Temperatures above 35°C, reduce product lifetime.
Avoid physical damages to storage containers.
Store the material in proper place. It should be dry, well ventilated and without direct and indirect incidence of heat.
Do not store close to incompatible substances (see item 10).
Prevent static discharge generation, keep grounded all equipment used in storage, manufacturing and substance transportation.
Use only anti-sparking tools.
Bulk storage should be made in stainless steel tanks.
Prolonged exposure can cause corrosion in some metals like alluminum, steel and copper.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- Control parameters:
Decree 3214/78, Regulatory Standard NR-15, chart I: 1.6 ppm (2.3 mg/m³) – ceiling value.
ACGIH-TLV/TWA = 0.3 ppm (ceiling value).
- Personal Protection Equipment:
Safety glasses, full vision; hard hat, apron (barber/barbeiro type) made of PVC or Tyvek (in the proper specification); pvc or hexanol gloves; safety boots or PVC boots; facial mask with cartridge for acid gases, selfcontained breathing apparatus our with supplied air.
For emergency assistance involving fire wear selfcontained breathing apparatus and full clothing.
For large spills, wear adequate clothing.

9. PHYSICAL-CHEMICAL PROPERTIES

- Physical state: volatile liquid
- Color: colorless
- Odour: orritant
- pH (25°C): **6.7 – 7.7**
- Boiling point (760 mmHg): not available
- Melting point: not available
- Flash point: 90 to 94°C.
- Auto-ignition temperature: 430°C.
- Explosion limits:
Lower: 7.0% by air volume.
Upper: 73% by air volume.
- Vapour pressure: not available.
- Vapour density (ar=1): not available.
- Liquid density/Densidade (20°C): 1.260 to 1.264 g/ml
- Solubility: not available

10. STABILITY AND REACTIVITY

- Stability and reactivity:

Stable, if observed the storage conditions.

The substance polymerizes without risk under high temperatures and reacts easily when in contact with phenol and aniline, releasing heat.

Atmospheric air can oxidize the substance forming formic acid, mainly when heated.

It happens auto-ignition when in contact with oxidizing substances, like potassium permanganate, nitrites, peroxides, chlorates and perchlorates.

It's incompatible also with ammonia, alkalis, bisulfides, copper salts, iron salts, silver salts and iodides.

It can occur corrosion in metals like aluminum, steel and copper due to prolonged contact.

The substance can react with hydrogen chloride under certain atmospheric conditions forming chloromethyl which is carcinogenic.

Incompatibilities: chlorides, acids, alkalis, oxidizing agents, isocyanates/isocianatos, anhidrites.

The substance suffers polymerization and subsequent degradation when substance temperature remains above 40°C.

- Hazardous decomposition products:

Toxic gases like carbon monoxide can be produced during fires involving formaldehyde solutions.

Biodegradation produces formic acid and methanol.

11. TOXICOLOGICAL INFORMATION

- Acute toxicity and local effects:

When inhaled the substance can cause ardor in nose and throat, cough, thickness, tears and pressure over the chest. High concentrations can cause in cramps risk and larynx swelling, eventually, pulmonar edema and pneumonia.

Even low concentrations can result in allergic risk (hypersensitivity), resulting in nasal congestion and difficult breathing, like an asthma.

When in contact with skin the substance causes irritation. Frequent and prolonged exposure causes setting and crackings in the skin resulting in hypersensitivity and increasing of the risk of allergic eczema.

When in contact with eyes the substance causes acute pain followed by ulceration/ulceração. Substance vapours cause extreme irritation and frequent contact causes eyelids inflammation.

When ingested, the substance causes hemorrhagic vomits, abdominal pain, possible shock, and damages to kidneys or death. They can occur abdomen and intestine ulcers, even if little amounts of the substance are ingested. A substância quando ingerida causa vômitos hemorrágicos, dor abdominal, possível choque, e danos aos rins ou morte. Úlceras no abdômen e intestinos podem ocorrer mesmo que pequenas quantidades sejam ingeridas.

- Known toxicological data:

Oral (woman) LD_{LO}: 108 mg/kg.

Oral (rat) LD₅₀: 800 mg/kg.

Inhalation (human): TC_{LO} 17 mg/m³/30M.

Inhalation (rat) LC_{50} : 590 mg/m³.

Dermic (rabbit) LD_{50} : 270 mg/kg.

- Irritation:
Skin (human): 0.15 mg/3d-I average.

12. ECOLOGICAL INFORMATION

- Environmental effects, behaviors and product impacts:
Product is acid. Before water discharging in purification units it is normally necessary neutralization. In case of correct introduction of little concentrations, it is not expected changes in activated sludge function of a purification unit biologically adapted.

Ecotoxicity:

LC_{50} : 10 – 100 mg/l, 96 hours (fish)

EC_{50} : 2 mg/l, 48 hours (*Daphia*)

IC_{50} : 0.4 mg/l, 24 hours (algae)

Product is readily biodegradable.

Bioaccumulative potential: bioaccumulation in aquatic organisms is not expected.

- Risks to environment:
water: it is not referred in Decree 36, 01/19/90, of Health Ministry about the maximum value allowed for potable waters.
air: odours emission can cause nuisance to community.
- Indications for elimination:
DBO: 37% in 5 days and 47% (theoretical) in 5 days.
DQO: not available.
- Henry Law constant: 3.27×10^{-7}
- Partition coefficient octanol/water: $\log K_{ow} = 0.35$.
Henry law constant: estimated to 8.5×10^{-14}
Ecotoxicity: not found data.
Bioaccumulation factor: estimated at 4.2.
DBO (Oxygen Biochemical Demand): 61%, 5 days.
Partition coefficient Octanol/Water: $\log K_{ow}$: calculated at 0.07 to 0.56.
Partition coefficient soil/sorption: K_{oc} : estimated at 3.5.

13. CONSIDERATIONS ABOUT TREATMENT AND DISPOSAL

- Treatment and disposal methods for product, wastes and used packages:
Any wastes treatment should be in accordance with local and national regulations.


14. TRANSPORTATION INFORMATION

- National and international regulations:
Follow hazardous goods road transportation regulation according to decree n° 96044, 05/18/88 and Resolution ANTT 420/04.
Follow hazardous goods ferry/train/ferroviário transportation regulation according to decree n° 98973, 02/21/90.
Follow Mercosur hazardous goods transportation regulation according to decree n° 1797, 01/25/96.
- **Road transportation (Brazil and MERCOSUR):**
Proper shipping name: FORMALDEHYDE, SOLUTIONS
Risk class: 8 (corrosive)
Risk N°: 80
UN N°: 2209
Package group: III
- Marine: Follow IMDG
PSN code: HLZ
Proper Shipping Name: Formaldehyde solution
Regulations page number: 8176-1
UN number: 2209
UN class: 8
Subsidiary risk label: -
- Aerial: Follow IATA-DGR
PSN code: MKH
UN ID number: 2209
Proper Shipping Name: Formaldehyde solution
UN class: 8
Label: CORROSIVE
Pack.Group: III

15. REGULATIONS

EPA regulations:

- RCRA 40 CFR: listed U122 toxic waste.
- CERCLA 40 CFR 302.4: listed by CWA Section 311 (b) (4), by Section RCRA 3001 100 lb (45.35 kg)
- SARA 40 CFR 372.65: Listed.
- SARA EHS 40 CFR 355: listed.
RQ: 100 lb
TPQ: 500 lb
- TSCA: listed.

 Elekeiroz MSDS	MATERIAL SAFETY DATA SHEET	PRODUCT: UREA FORMALDEHYDE CONCENTRATE ISSUE: 01/23/02 REVISION: 07/25/2008 Nº MSDS: 59 REV. Nº: 4 PAGE: 8/8
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EPA – Environmental Protection Agency

SARA - Superfund Amendments and Reauthorization Act

RCRA - Resource Conservation and Recovery Act

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

TSCA - Toxic Substances Control Act

16. OTHER INFORMATION

References:

- MSDS - GENIUM PUBLISHING CORP. (record n.º **FOR1000** – revision dte **June/06**);
- Elekeiroz Specification
- IATA/DGR – International Air Transport Association – **Edition 2008**.
- IMO/IMDG – International Maritime Dangerous Goods – Edition 2006.
- Manual ACGIH, Portuguese version **2007** (translation: ABHO).
- Commented Regulatory Standards – Health and Safety Regulation Volume I – Press GVC 2005.

Observation:

The information contained in this MSDS are offered in good faith and as guide tool, without incurring expressed or implicit liability. If clearings or additional information are needed, consult the manufacturer.