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Material Safety Data Sheet

# Urea Liquor

MSDS Number 2046 (Revised Mar. 20, 2000)

6 Pages

## **1. CHEMICAL PRODUCT and EMERGENCY TELEPHONE CONTACT**

Product Name..... : Urea Liquor  
 Chemical Family..... : Amide  
 Synonyms..... : Urea Cattle Feed  
 Formula..... :  $CH_4N_2O + H_2O$

**EMERGENCY TELEPHONE NUMBER**  
 CHEMTREC..... : 800-424-9300

## **2. COMPOSITION / INFORMATION ON INGREDIENTS**

Component Name	Percentage by Weight	CAS Number
Urea	50 - 70 %	57-13-6
Free Ammonia	0.1 - 1.0 %	
Biuret	0.1 - 0.5 %	
Ammonium Carbamate	0.1 - 0.5 %	
Water	28 - 49.7%	

Exposure Limits for Components				
Component	TWA	STEL	PEL	IDLH
Ammonia	25 ppm	35 ppm	50 ppm	300 ppm
No limits established for urea liquor, biuret, or ammonium carbamate				

## **3. HAZARDS IDENTIFICATION**

### **EMERGENCY OVERVIEW**

Colorless liquid. With slight ammonia (pungent) odor and may have a faint salty taste. Reacts with sodium hypochlorite or calcium hypochlorite to form the explosive, nitrogen trichloride. When heated to decomposition it emits toxic fumes of nitrogen oxides (NO<sub>x</sub>) and/or ammonia. Use water to control fires involving urea liquor, if water is compatible with burning product, urea liquor itself is non-flammable.

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## **POTENTIAL HEALTH EFFECTS**

**Primary Routes of Entry:** Skin contact/absorption, eye contact, and vapor inhalation.

**General Acute Exposure:** May cause irritation to eyes and skin. Ammonia and carbondioxide vapors may accumulate in a confined space and present ammonia and carbon dioxide gases.

**General Chronic Exposure:** No test data available.

### **Carcinogenicity:**

NTP..... : Not Listed  
IARC..... : Not Listed  
OSHA..... : Not Regulated

**Medical Conditions Aggravated by Exposure:** No test data available.

## **4. FIRST AID MEASURES**

**First Aid for Eyes:** Flush eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, excessive tearing, or light sensitivity persists, the patient should be seen in a health care facility.

**First Aid for Skin:** If irritation occurs, flush exposed area with copious amounts of tepid water for at least 15 minutes followed by washing area thoroughly with soap and water. The patient should be seen in a health care facility if irritation or pain persists.

**First Aid for Inhalation:** If irritation develops move patient to fresh air and monitor. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation. If trained to do so, administer supplemental oxygen if needed. If irritation, coughing, or difficulty in breathing persists the patient should be seen in a health care facility.

**First Aid for Ingestion:** If conscious, give the patient large quantities of water to drink and induce vomiting. Seek medical attention.

## **5. FIRE FIGHTING MEASURES**

Urea liquor is not flammable.

**Extinguishing Media:** Use water to extinguish a fire involving urea liquor, if water is compatible with the burning product.

### **Special Fire Fighting Procedures:**

- a. Positive pressure self-contained breathing apparatus (SCBA) should be used when there is a potential for inhalation of vapors and/or fumes.
- b. Wear full fire fighting protective equipment which is proper for conditions.

### **Caution:**

- a. Runoff from fire control or dilution water may cause pollution.
- b. At elevated temperature, urea liquor may decompose to form cyanuric acid, ammonia, biuret, and/or nitrogen oxides.

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## **6. ACCIDENTAL RELEASE MEASURES**

**Spill or Leak Measures:** Keep unnecessary people away and isolate hazard area. Urea liquor may be toxic to cattle (ruminants) when ingested, if amount ingested is not controlled properly.

**Determining Spill Size:** Generally, a small spill is one which involves a single, small package (i.e. up to a 55 gallon drum), small cylinder, or a small (non-continuing) leak from a large container.

**Small Spill:**

- a. Spilled urea liquor may cause slippery conditions.
- b. Recover and use as fertilizer.
- c. If disposal of product or contaminated by-products is necessary, follow guidelines set forth by local, state, and federal environmental agencies.
- d. Runoff may cause pollution.

**Large Spill:**

- a. Spilled urea liquor may cause slippery conditions.
- b. Recover and use as fertilizer.
- c. If disposal of product or contaminated by-products is necessary, follow guidelines set forth by local, state, and federal environmental agencies.
- d. Runoff may cause pollution.

## **7. HANDLING AND STORAGE**

No unusual precautions are necessary.

**Handling Precautions:** Use proper personal protective equipment when working with or around urea liquor. (See section 8).

## **8. EXPOSURE CONTROLS, PERSONAL PROTECTION**

**Respiratory Protection Requirements:** Urea liquor may pose an inhalation hazard in confined areas due to its ability to produce ammonia and carbon dioxide vapors. If necessary to enter an area which contains urea liquor, monitor for ammonia and oxygen content. Oxygen levels should be maintained between 19.5% and 23.5%, if outside of this range use appropriate precautions. If ammonia vapors are present, protect as follows:

- <25 ppm: No protection required.
- 25 to 35 ppm: Protection required if the daily TWA is exceeded.
- 35 to 50 ppm: Protection required if exposed for more than 15 minutes
- 50 to 250 ppm: Minimum of an air-purifying respirator equipped with ammonia canister(s) or cartridge(s).
- 250 to 300 ppm: Minimum of a full face air-purifying respirator equipped with ammonia canister(s) or cartridge(s).
- >300 ppm: A fresh air supply system must be used (i.e. positive pressure self contained breathing apparatus)

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**Engineering Controls:** Adequate ventilation should be supplied.

**Skin Protection Requirements:** Impervious gloves should be worn. urea liquor is shipped as a hot liquid (approximately 220° F), as thus, additional protection for hands and skin should be used to prevent contact of hot liquid.

**Eye Protection Requirements:** It is recommended that safety glasses or goggles be used and if there is a potential for splashing liquid, a face shield should be used in conjunction with the safety glasses or goggles.

**Other Protective Equipment:** Safety shower and eyewash fountain or at least 5 gallons of accessible clean water should be provided in a urea liquid handling area.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form.....	: Liquid
Color.....	: Colorless
Odor.....	: Slight ammonia odor (pungent)
Boiling Point.....	: 50% urea solution boils at 223° F
Melting point.....	: 50% urea solution salts out at 64°F 70% urea solution salts out at 135°F
pH.....	: No test results
Solubility.....	: 100%
Specific Gravity.....	: 1.14 for 50% urea solution 1.175 for 70% urea solution
Vapor Density.....	: No test results
Vapor Pressure.....	: No test results
% Volatile by Volume.....	: No test results
Molecular Weight.....	: Not applicable
Density.....	: 9.51 lb. per gallon for 50 % solution 9.80 lb. per gallon for 70 % solution
Critical Temperature.....	: No test results
Critical Pressure.....	: No test results

## 10. REACTIVITY

Stability.....	: This is a stable material.
Hazardous Polymerization.....	: Will not occur.

**Decomposition:** Urea liquor forms ammonia, cyanuric acid, biuret, and/or nitrogen oxides (NO<sub>x</sub>) upon decomposition.

**Incompatibilities:** Reacts with sodium hypochlorite or calcium hypochlorite to form nitrogen trichloride which may explode spontaneously in air. Incompatible with sodium nitrite, phosphorus pentachloride, and nitrosyl perchlorate.

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## **11. TOXICOLOGICAL INFORMATION**

Human Skin Irritant .....	: 22 mg / 3 day - intermittent exposure
TDLo, oral, Rat .....	: 821 g/kg
TDLo, oral Mouse .....	: 394 g/kg
LD 50, oral, Rat .....	: 8471 mg/kg
LD 100, Creek Chub .....	: 16,000 mg/l, 24 hour

## **12. ECOLOGICAL INFORMATION**

Notify local health and wildlife officials and operators of any nearby water intakes of contamination or discharge into or leading to waterways.

**Urea** (Source; CF Industries, UAN MSDS, 1995)

Urea can be toxic to domestic animals and has caused poisonings when it was applied unevenly on pastures as a fertilizer. Large amounts of urea can damage plant seedlings and inhibit germination. At high concentrations, urea can be toxic to aquatic life. As a readily available source of nitrogen, urea can also foster excessive growth of algae or microorganisms in water systems.

The cell multiplication toxicity threshold values for bacteria, green algae, and protozoa are > 10,000, >10,000, and 29 mg/L, respectively. The critical range for the creek chub is 16,000 to 30,000 mg/L in Detroit river water.

In the soil, urea degrades rapidly, usually within 24 hours, however, degradation may be slower depending on soil type, moisture content, and urea formulation. The ultimate degradation products are carbon dioxide and ammonia. The soil mobility is high based on an organic carbon partition coefficient value of 8. In water, biodegradation rate increases with increasing temperature and presence of phytoplankton. Oxidation of urea by nitrifying bacteria can increase biological oxygen demand. Bioaccumulation of urea is very low. The 72-hour bioconcentration factor (BCF) for carp is reported to be 1.

## **13. DISPOSAL CONSIDERATIONS**

Urea liquor is not listed by the Federal EPA as a hazardous waste. Consult state and local environmental agencies for acceptable disposal methods.

## **14. TRANSPORTATION INFORMATION**

Urea liquor is not listed by any transportation authority as a hazardous material and as such, no specific information is available.

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## **15. REGULATORY INFORMATION**

**SARA TITLE III:** Not Listed

**CERCLA Hazardous Substances List:** Not Listed

**TSCA Inventory:** Listed

### **REVISIONS**

Nov. 5, 1996: The MSDS was rewritten to comply to ANSI Standard Z400.1-1993,  
by Roger Allison.

Feb. 16, 1999 Revised to make minor typographical and editorial changes.

The information and recommendations herein are taken from data contained in independent, industry recognized references including but not limited to NIOSH, OSHA, CHRIS, and SAX's Dangerous Properties of Industrial Materials - ninth edition. Thus, Terra Nitrogen Corporation, makes no guarantee, warranty or other representation concerning this substance, since conditions of its use are beyond the control of the company. Terra Nitrogen Corporation disclaims any liability for loss or damage incurred in connection with the use of this substance.