1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>![Hazards Icons]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product code:</th>
<th>U1015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name:</td>
<td>UREA, CRYSTAL, REAGENT, ACS</td>
</tr>
<tr>
<td>Chemical Name:</td>
<td>Carbonyldimide</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>Carbamide, Carbonyldiamine, Isourea, Ureaphil, Ureophil, Carbonyldiamide</td>
</tr>
<tr>
<td>Recommended use:</td>
<td>Manufacturing of resins, plastics; Condensed with Malonic ester to form Barbituric acid; cellulose softner; in ammoniated dentifrices; chemical intermediate; stabilizer in explosives; in medicine (diuretic); separation of hydrocarbons; sulfamic acid production; in flameproofing agents; liquid and other fertilizer applications; livestock nutrient; monomer for urea-formaldehyde resins; insect (mosquito) repellent.</td>
</tr>
<tr>
<td>CAS #:</td>
<td>57-13-6</td>
</tr>
<tr>
<td>RTECS #:</td>
<td>YR6250000</td>
</tr>
<tr>
<td>Formula:</td>
<td>NH₂)₂CO or CH₄N₂O</td>
</tr>
<tr>
<td>CI#:</td>
<td>Not available</td>
</tr>
<tr>
<td>Supplier:</td>
<td>Spectrum Chemicals and Laboratory Products, Inc.</td>
</tr>
<tr>
<td></td>
<td>14422 South San Pedro St.</td>
</tr>
<tr>
<td></td>
<td>Gardena, CA 90248</td>
</tr>
<tr>
<td></td>
<td>(310) 516-8000</td>
</tr>
<tr>
<td>Order Online At:</td>
<td><a href="https://www.spectrumchemical.com">https://www.spectrumchemical.com</a></td>
</tr>
<tr>
<td>Emergency Telephone Number:</td>
<td>CHEMTREC: 1-800-424-9300</td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Regina Wachenheim (East Coast)</td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Martin LaBenz (West Coast)</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION
2. HAZARDS IDENTIFICATION

Chronic Potential Health Effects:

Component Carcinogen Status:
- Urea 57-13-6 (100)
  - No information available

Target Organs:
- No information available

Mutagenic Effects:
- May affect genetic material
  - Mutagenic effects in mammalian somatic cells
  - Experiments with animal lymphocytes have shown mutagenic effects
  - Experiments with human lymphocytes have shown mutagenic effects

Teratogenic Effects:
- No information available

Aggravated Medical Conditions:
- No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

EMERGENCY OVERVIEW

WARNING! IRRITANT
- Irritating to eyes
- Irritating to skin

Odor:
- Almost odorless. It may gradually develop a slight odor of ammonia, especially in the presence of moisture.

Physical state:
- Solid.

Appearance:

Color:
- White.

OSHA Regulatory Status
- This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
- Ingestion. Inhalation.

Acute Potential Health Effects:

Skin Contact:
- Causes skin irritation. Mild skin irritation.

Eye Contact:
- Causes eye irritation. Mild eye irritation.

Inhalation:
- May cause irritation of respiratory tract.

Ingestion:
- Causes digestive (gastrointestinal) tract irritation. May cause abdominal pain, nausea, vomiting, diarrhea. May affect respiration. May cause central nervous system effects. May affect the cardiovascular system. It may affect the kidneys. May affect the blood. May affect electrolyte balance.

Chronic Potential Health Effects:

Product code: U1015

Product name: UREA, CRYSTAL, REAGENT, ACS
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>57-13-6</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**General Advice:** Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126).

**Skin Contact:** Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

**Eye Contact:** Flush eye with water for 15 minutes. Get medical attention.

**Inhalation:** Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

**Notes to Physician:** Treat symptomatically

5. FIRE-FIGHTING MEASURES

**Flammable Properties**

**Flashpoint (°C/°F):** No information available.

**Flash Point Tested according to:** Not applicable

**Lower Explosion Limit (%):** No information available

**Upper Explosion Limit (%):** No information available

**Autoignition Temperature (°C/°F):** No information available

**Suitable Extinguishing Media:** Dry chemical. Carbon dioxide (CO2). Water spray mist or foam.

**Unsuitable Extinguishing Media:** No information available.

**Hazardous Combustion Products:** Carbon monoxide; Carbon dioxide; Nitrogen oxides

**Specific hazards:** May be combustible at high temperatures

**Special Protective Equipment for Firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

**Specific Methods:** No information available.
6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Avoid dust formation. Remove all sources of ignition.

Environmental Precautions:
No information available.

Methods for Cleaning Up:
Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Do not ingest. Do not breathe vapours/dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials:
Oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:
Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protective Equipment

Eye protection: Goggles.
Skin and body protection: Long sleeved clothing. Chemical resistant apron. Gloves.
Respiratory protection: Wear respirator with dust filter..
Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
</thead>
</table>

Product code: U1015
Product name: UREA, CRYSTAL, REAGENT, ACS
9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:**
Solid.

**Appearance:**

**Color:**
White.

**Odor:**
Almost odorless. It may gradually develop a slight odor of ammonia, especially in the presence of moisture.

**Taste**
Saline.

**Flash point (°C):**
No data available

**Autoignition Temperature (°C/°F):**
No information available

**pH:**
No information available

**Decomposition temperature (°C/°F):**
No information available

**Evaporation rate:**
No information available

**Odor threshold (ppm):**
No information available

**Solubility:**
Very soluble in water
Soluble in Methanol
Insoluble in Ether
Insoluble in Chloroform
Insoluble in Benzene
Soluble in Acetic acid
Soluble in concentrated hydrochloric acid
Solubility: 1 gram dissolves in 1 ml water, 10 ml of 95% Alcohol, 6 ml Methanol, 1 ml boiling 65% Alcohol, 2 ml Glycerol

**Vapor pressure @ 20°C (kPa):**
No information available

**Boiling point/range (°C/°F):**
No information available

**Melting point/range (°C/°F):**
132-135 °C/269.6-275 °F

**Specific gravity:**
1.323

**Density (g/cm3):**
No information available

**VOC content (g/L):**
No information available

**Molecular/Formula weight:**
60.06

10. STABILITY AND REACTIVITY

**Stability:**
Stable at normal conditions

Incompatible Materials: Oxidizing agents.


Possibility of Hazardous Reactions: Reacts violently with Gallium Perchlorate. Reacts with chlorine to form chloramines. It also reacts with the following: sodium hypochlorite, sodium nitrate, calcium hypochlorite, NaNO2, P2Cl5, nitrosyl perchlorate, strong oxidizing agents (permanganate, nitrate, dichromate, chloride)

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Urea - 57-13-6
- LD50/oral/rat = 8471 mg/kg (RTECS)
- LD50/oral/mouse = 11000 mg/kg
- LD50/dermal/rat = No information available
- LD50/dermal/rabbit = No information available
- LC50/inhalation/rat = No information available
- LC50/inhalation/mouse = No information available
- Other LD50 or LC50 information = No information available

Product Information

- LC50/inhalation/rat No information available
- LC50/inhalation/mouse No information available
- LD50/dermal/rabbit No information available
- LD50/dermal/rat No information available
- LD50/oral/mouse = 11000mg/kg
- LD50/oral/rat = 8471mg/kg

Local Effects

Skin irritation: Causes skin irritation. Mild skin irritation.

Eye irritation: Causes eye irritation. Mild eye irritation.

Inhalation: May cause irritation of respiratory tract.
Ingestion:

Sensitization:
May cause sensitization by skin contact

Chronic Toxicity
Chronic exposure may affect the liver and kidneys. Chronic exposure may affect the blood (leukocytosis, thrombosis). Chronic exposure may affect the brain.

Carcinogenic effects:
Tumorigenic agent by RTECS criteria. No other information.

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA HCS - Carcinogens</th>
<th>ACGIH - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects:
May affect genetic material
Mutagenic effects in mammalian somatic cells
Experiments with animal lymphocytes have shown mutagenic effects
Experiments with human lymphocytes have shown mutagenic effects

Reproductive Effects:
No information available

Teratogenic Effects:
No information available

Target Organs:
No information available

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: Information given is based on data on the components and the ecotoxicology of similar products

Ecotoxicity effects: Aquatic environment.

Aquatic toxicity:

Urea - 57-13-6

Freshwater Fish Species Data: 16200 - 18300 mg/L LC50 Poecilia reticulata 96 h 1
Water Flea Data: 3910 mg/L EC50 Daphnia magna 48 h

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.
13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Urea</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
- UN-No: Not regulated
- Proper Shipping Name: No information available
- Hazard Class: No information available
- Packing Group: None
- Subsidiary Risk: Not applicable
- Marine Pollutant: No data available
- ERG No: No information available
- DOT RQ (lbs): No information available

TDG (Canada)
- UN-No: Not Regulated
- Proper Shipping Name: No information available
- Hazard Class: No information available
- Packing Group: No information available
- Subsidiary Risk: No information available
- Description: No information available

ADR
- UN-No: No information available
- Proper Shipping Name: No information available
- Hazard Class: No information available
- Packing Group: No information available
- Subsidiary Risk: No information available
- Classification Code: No information available
- Description: No information available
- CEFIC Tremcard No: No information available

IMO / IMDG
- UN-No: Not Regulated
- Proper Shipping Name: No information available
- Hazard Class: No information available
- Packing Group: No information available
- Subsidiary Risk: No information available
- Description: No information available
- IMDG Page: No information available
- Marine Pollutant: No information available
- MFAQ: No information available
- Maximum Quantity: No information available

RID
- UN-No: No information available
- Proper Shipping Name: No information available

Product code: U1015  Product name: UREA, CRYSTAL, REAGENT, ACS
15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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<tbody>
<tr>
<td>Urea</td>
<td>Present</td>
<td>Present</td>
<td>Present KE-35144</td>
<td>Present (2)-1732</td>
<td>Present</td>
<td>Present</td>
<td>Present 200-315-5</td>
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</table>

U.S. Regulations

*Urea*

- Minnesota - Hazardous Substance List: Present
- FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1923


**Chemicals Known to the State of California to Cause Cancer:**
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</tbody>
</table>

U.S. TSCA

Product code: U1015  
Product name: UREA, CRYSTAL, REAGENT, ACS
Components

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) -Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
Non-controlled

Urea
Uncontrolled product according to WHMIS classification criteria

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
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<td>Not listed</td>
</tr>
</tbody>
</table>

EU Classification

R-phrase(s)
not determined

S -phrase(s)
none

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Not dangerous

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1/Z129.1-2010 standards.

Preparation Date: 19-Feb-2014

Product code: U1015  Product name: UREA, CRYSTAL, REAGENT, ACS
All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.