

MATERIAL SAFETY DATA SHEET

UREA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

MANUFACTURER'S NAME: GENOMIC SOLUTIONS
ADDRESS: 4355 VARSITY DR. ANN ARBOR, MI 48108
TELEPHONE NUMBER: (734) 975-4800
US EMERGENCY PHONE: (800) 535-5053
INTERNATIONAL EMERGENCY PHONE: 1(352) 323-3500 (Call Collect)

CAS NUMBER: 57-13-6
RTECS NUMBER: YR6250000

SUBSTANCE: UREA

TRADE NAMES/SYNONYMS:
80-0180, UREA, 100G; 80-0070, UREA, 1000G; CARBONYLDIAMIDE; UREAPHIL; UREOPHIL;
CARBAMIMIDIC ACID; VARIOFORM II; UREAPEARL; CARBONYL DIAMIDE; UREA CRYSTALS;
CARBAMIDE; CH4N2O.

CHEMICAL FAMILY: AMIDE

CREATION DATE: 6/14/95
REVISED: 2/20/98

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

COMPONENT: UREA
CAS NUMBER: 57-13-6
PERCENTAGE: 100
OTHER CONTAMINANTS: NONE

PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Colorless to white, hygroscopic, tetragonal prisms, pellets or powder with a slight ammonia-like odor and a cooling saline taste.

MOLECULAR WEIGHT: 60.06

MOLECULAR FORMULA: H₂-N-C-O-N-H₂

MELTING POINT: 275 F (135 C) -decomposes above 275 F (135 C)

BOILING POINT: N/A

VAPOR PRESSURE: no data available

VAPOR DENSITY: N/A

SPECIFIC GRAVITY: 1.3230

WATER SOLUBILITY: 100%

pH: 7.2 @ 10% solution

ODOR THRESHOLD: no data available

EVAPORATION RATE: N/A

SOLVENT SOLUBILITY: Soluble in methanol, pyrimidine, absolute alcohol, glycerol, concentrated hydrochloric acid, acetic acid; slightly soluble in ether; almost insoluble in chloroform.

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SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

CERCLA RATINGS (SCALE 0-3): HEALTH = 3 FIRE = 1 REACTIVITY = 0 PERSISTENCE = 0
NFPA RATINGS (SCALE 0-4): HEALTH = 1 FIRE = 1 REACTIVITY = 0

EMERGENCY OVERVIEW:

Colorless to white, hygroscopic, tetragonal prisms, pellets or powder with a slight ammonia-like odor and a cooling saline taste. Causes eye irritation. May be irritating to the respiratory tract and skin. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS

INHALATION:

Short Term Effects: May cause irritation. Additional effects may include sneezing, coughing and shortness of breath.

Long Term Effects: May cause lung effects.

SKIN CONTACT:

Short Term Effects: May cause irritation. Additional effects may include itching.

Long Term Effects: May cause rash.

EYE CONTACT:

Short Term Effects: May cause irritation.

Long Term Effects: No information available on significant adverse effects.

INGESTION:

Short Term Effects: May cause sore throat and stomach pain.

Long Term Effects: May cause tumors.

CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: N

FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARD:

Slight fire hazard when exposed to heat or flame.

EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

FIREFIGHTING:

Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

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FLASH POINT: no data available
LOWER FLAMMABLE LIMIT: no data available
UPPER FLAMMABLE LIMIT: no data available
AUTOIGNITION: no data available

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include biuret, cyanuric acid, corrosive fumes of ammonia, and toxic oxides of nitrogen and carbon.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY AND REACTIVITY

REACTIVITY:

Stable under normal temperatures and pressures.

CONDITIONS TO AVOID:

May burn but does not ignite readily. Avoid contact with strong oxidizers, excessive heat, sparks, or open flame.

INCOMPATIBILITIES:

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ACIDS: Incompatible.

ALKALIS: Incompatible.

CALCIUM HYPOCHLORITE: Forms explosive compound.

CHROMYL CHLORIDE: Ignites on contact.

DICHLOROMALEIC ANHYDRIDE + SODIUM CHLORIDE: May explode above 118 C if not ice cooled.

GALLIUM PERCHLORATE: Violent decomposition when heated.

NITRATES: Incompatible.

NITRIC ACID: Possible explosion on heating.

NITROSYL PERCHLORATE: Ignited when stirred.

OXIDIZERS (STRONG): Fire and explosion hazard.

PHOSPHORUS PENTACHLORIDE: May explode if heated.

POTASSIUM NITRITE: Possible explosion hazard.

SODIUM HYPOCHLORITE: Forms explosive compound.

SODIUM NITRITE: Possible explosion hazard.

TITANIUM TETRACHLORIDE: May form explosive complex on prolonged storage.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products may include biuret, cyanuric acid, corrosive fumes of ammonia, and toxic oxides of nitrogen and carbon.

POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

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SECTION 5 - HEALTH HAZARD DATA

EMERGENCY FIRST AID

INHALATION:

First Aid - Remove to fresh air. If breathing becomes difficult, call a physician.

SKIN CONTACT:

First Aid - Flush with copious amounts of water for at least 15mins. Remove contaminated clothing and shoes and call a physician.

EYE CONTACT:

First Aid - Flush with copious amounts of water for at least 15mins. Assure adequate flushing by separating the eyelid with fingers. Call a physician.

INGESTION:

First Aid - Wash out mouth with water. Call a physician.

TOXICOLOGY INFORMATION

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IRRITATION DATA:

22 mg/3 days intermittent skin-human mild

TOXICITY DATA:

8471 mg/kg oral-rat LD50	4600 mg/kg intravenous-mouse LD50
11 gm/kg oral-mouse LD50	4800 mg/kg intravenous-rabbit LDLo
511 mg/kg oral-domestic animal LDLo	3000 mg/kg intravenous-dog LDLo
8200 mg/kg subcutaneous-rat LD50	6608 mg/kg intraperitoneal-mouse LDLo
9200 mg/kg subcutaneous-mouse LD50	mutagenic data (RTECS)
3000 mg/kg subcutaneous-rabbit LDLo	reproductive effects data (RTECS)
3000 mg/kg subcutaneous-dog LDLo	tumorigenic data (RTECS)
5300 mg/kg intravenous-rat LD50	
> 21000 mg/kg skin-rabbit LD50 (american industrial hygiene association 1988)	

CARCINOGEN STATUS: None.

LOCAL EFFECTS: Irritant - eye.

ACUTE TOXICITY LEVEL: Slightly toxic by ingestion; relatively non-toxic by dermal absorption.

TARGET EFFECTS: No data available

AT INCREASED RISK FROM EXPOSURE: Persons with skin, eye, respiratory, or kidney disorders.

HEALTH EFFECTS

INHALATION:

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Acute Exposure: May cause irritation with sore throat, sneezing, coughing, and shortness of breath.

Chronic Exposure: Repeated and prolonged occupational exposure to high concentrations has been reported to cause emphysema.

SKIN CONTACT:

Acute Exposure: May cause irritation. A burning and itching sensation that disappears within a hour has been reported from using urea creams.

Chronic Exposure: Prolonged exposure may cause some redness or rash due to mild irritation.

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EYE CONTACT:

IRRITANT.

Acute Exposure: Contact may cause irritation with redness and pain. Powder applied to human eyes caused clouding of the front part of the eye. This cleared up completely several weeks after the end of exposure.

A saturated urea solution applied to rabbit eyes caused loss of corneal epithelium, and produced moderate grayness of the stroma with subsequent slow regeneration of the epithelium. A rabbit's cornea returned to normal after several weeks following a one hour exposure to a 40% solution.

Chronic Exposure: A 10% solution of urea in water used as eye drops several times a day for a year caused no eye irritation or discomfort.

INGESTION:

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Acute Exposure: Ingestion may cause sore throat and abdominal pain.

Chronic Exposure: Among female mice treated with urea, there was a significant occurrence of hematopoietic tumors, namely, malignant lymphomas. Among the urea treated rats, there was a significant linear trend and a higher proportion of interstitial adenomas. However, the increased incidence of malignant lymphomas in mid-dose female mice was non-dose related.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

EXPOSURE LIMITS:

No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

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10 mg/m³ AIHA recommended TWA

VENTILATION:

Provide local exhaust ventilation. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

EMERGENCY WASH FACILITIES:

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

CLOTHING:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

GLOVES:

Employee must wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR:

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

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Any dust and mist respirator.

Any air-purifying respirator with a high-efficiency particulate filter.

Any powered air-purifying respirator with a dust and mist filter.

Any powered air-purifying respirator with a high-efficiency particulate filter.

Any type 'C' supplied-air respirator operated in the pressure-demand or other positive pressure or continuous-flow mode.

Any self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/LEAK PROCEDURES

ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL:

Sweep up and place in suitable clean, dry containers for reclamation or later disposal. Do not flush spilled material into sewer. Keep unnecessary people away.

HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance. Keep in a tightly closed container. Store in a cool, dry, ventilated area. Store away from incompatible substances.

DISPOSAL INFORMATION

Observe all federal, state and local regulations when disposing of this substance.

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SECTION 8 - TRANSPORTATION AND REGULATORY INFORMATION

TRANSPORTATION INFORMATION:

No classification currently assigned.

REGULATORY INFORMATION:

TSCA STATUS: Y
CERCLA SECTION 103 (40CFR302.4): N
SARA SECTION 302 (40CFR355.30): N
SARA SECTION 304 (40CFR355.40): N
SARA SECTION 313 (40CFR372..65): N
OSHA PROCESS SAFETY (29CFR1910.119): N
CALIFORNIA PROPOSITION 65: N

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD: Y
CHRONIC HAZARD: N
FIRE HAZARD: N
REACTIVITY HAZARD: N
SUDDEN RELEASE HAZARD: N

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