

MATERIAL SAFETY DATA SHEET**ACRYLAMIDE SOLUTION**

PRODUCT CODE NUMBER(S): 0732-6

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: *Acrylamide solution; Propenamide solution; Ethylenecarboxamide solution*
Chemical Family: *Unsaturated aliphatic amide in aqueous solution*
Chemical Formula: C_3H_5NO in H_2O
Product Use: *Laboratory reagent*
Manufacturer's Name and Address:
*Caledon Laboratories Ltd.
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HAZARDOUS INGREDIENTS OF MATERIALS

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Acrylamide</i>	<i>40</i>	<i>0.03 mg/m³ (skin)</i>	<i>79-06-1</i>

PHYSICAL DATA

Physical State: *Liquid*
Odour and Appearance: *Clear, colourless solution, odourless*
Odour Threshold (ppm): *Not available*
Vapour Pressure (mm Hg): *18.1 @ 23°C*
Vapour Density (Air = 1): *2.45*
Evaporation Rate: *Not available*
Boiling Point (degrees C): *99-104°C*
Freezing Point (degrees C): *8-13°C*
pH: *5.0 to 6.5 (50% aqueous solution)*
Specific Gravity: *1.41 @ 25°*
Coefficient of Water/Oil distribution: *LogP (oct) -0.67*

SHIPPING DESCRIPTION

UN: 3426
T.D.G. Class: 6.1
Pkg. Group: III

REACTIVITY DATA

Chemical Stability: *Unstable; can polymerize violently if uninhibited, with release of highly flammable hydrogen and toxic ammonia gases.*
Incompatibility with other substances: *Oxidizers. May polymerize violently upon contact with oxidizing materials, e.g. peroxides. May react vigorously with acids, bases producing ammonia salts and acrylic acid. Moisture sensitive.*
Reactivity: *Avoid heat, sunlight, contact with oxidizers, acids, bases, metals, all incompatible materials, generation of mist. Avoid evaporation of water from solution, and depletion of inhibitor.*

Hazardous Decomposition Products: *Flammable hydrogen gas, ammonia gas, CO_x, NO_x*

FIRE AND EXPLOSION DATA

Flammability: *Non flammable, but decomposes above 85°C to release highly flammable hydrogen gas. In fire situation, grave danger of explosion.*
Extinguishing Media: *Water spray, carbon dioxide, dry chemical powder, alcohol-resistant foam, polymer foam. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (NIOSH/OSHA approved self-contained breathing apparatus) and clothing sufficient to prevent inhalation of mists or vapours, and contact with skin and eyes (encapsulating chemical splash suit-Bunker Gear will not be adequate). Use water spray or fog to cool fire-exposed containers, from as far away as possible. Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.*

Flash Point (Method Used): 138°C

Autoignition Temperature: 240°C

Upper Flammable Limit (% by volume): *Not applicable*
Lower Flammable Limit (% by volume): *Not applicable*
Hazardous Combustion Products: *Flammable hydrogen gas, ammonia gas, CO_x, NO_x*
Sensitivity to Impact: *None identified*
Sensitivity to Static discharge: *Decomposes violently if uninhibited, or on contact with oxidizers, releasing highly flammable/explosive hydrogen gas, which is readily ignited by static discharge.*

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:**

LD₅₀: (oral, rat) 124 mg/kg; (dermal, rat) 400 mg/kg
LC₅₀: *Not applicable*

Effects of Acute Exposure to Product:

Inhaled: *Irritating to nose and throat. Highly toxic. Skin exposure is the usual cause of toxicity in the workplace, but inhalation can also be a hazard. Acute poisoning usually leads to CNS disturbances such as drowsiness, tingling sensations, fatigue, weakness, stumbling, slurred speech and shaking. Neurotoxicity may occur after repeated low dose exposure or several weeks after an acute exposure, causing muscular weakness, paresthesia, numbness in hands, feet, lower legs, and lower arms, unsteadiness, and difficulties in walking and standing. Autonomic nervous system involvement is indicated by excessive sweating, peripheral vasodilation and difficulties in micturation and defecation.*
In contact with skin: *Very toxic, irritating. Readily absorbed by skin causing neurotoxicity (see "Inhaled"). Onset of symptoms may be delayed for several days or weeks.*
In contact with eyes: *No human information available. Based on animal information, probably moderate irritant, causing redness, tearing, temporary pain. Severe overexposure can lead to absorption with neurotoxicity as in "Inhaled".*

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Ingested: Highly toxic, although ingestion is not the typical route of industrial exposure. Symptoms as in "Inhaled".

Effects of Chronic Exposure to Product:

Is absorbed rapidly and distributed widely in the body. Crosses placental barrier, occurs in breast milk. Accumulates temporarily, but most is broken down within a day. Repeated exposure to low levels of dust has resulted in neurotoxicity in humans. Primary route of exposure is skin absorption, but inhalation and ingestion can contribute to overall exposure. Symptoms may be delayed 2 weeks to 2 months; they include tiredness, weakness in hands and feet, tremor, dizziness, muscular inco-ordination, poor memory, confusion, slurred speech, vision changes, urinary system changes, weight loss. Recovery may be good, but may take months to years depending on severity and duration of exposure.

Repeated skin exposure can cause redness, blistering and peeling of skin, particularly on hands and feet. May also cause skin sensitization.

Carcinogenicity: Evidence of carcinogenicity in animals; inadequate evidence in humans at present. IARC class: 2A (probable human carcinogen). ACGIH class: A3 (animal carcinogen).

Teratogenicity: No human information available. Inconclusive animal information: some embryotoxic effects at doses affecting parents; no teratogenic effects in animal studies.

Reproductive Effects: No human information available. Some adverse effects in male animals.

Mutagenicity: In animal studies, caused mutations in reproductive cells and blood-forming cells.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation required.

Respiratory Protection: Dust/mist mask, fume hood. For concentrations above the recommended exposure limit ($0.03\text{mg}/\text{m}^3$), or for unknown concentrations, use positive pressure, full face-piece self-contained breathing apparatus, or positive pressure, full face-piece supplied air respirator with auxiliary positive pressure self-contained breathing apparatus.

Eye Protection: Chemical safety goggles and/or face shield.

Skin Protection: Butyl rubber, Tychem BR/LV, Tychem SL, Tychem TK gloves Coveralls, boots, other clothing sufficient to prevent any contact.

Other Personal Protective Equipment: Safety shower and eye-wash fountain in work area.

Leak and Spill Procedure: Evacuate area. Eliminate all ignition sources. Cleanup personnel must be thoroughly trained in the handling of hazardous materials, and must wear protective equipment and clothing sufficient to prevent any inhalation of vapours or mists and any contact with skin and eyes. Stop or reduce leak if safe to do so. Prevent material from entering sewers or waterways. Mix with inert absorbent, transfer to container and arrange removal by disposal company. Contaminated absorbent may pose the same hazards as the chemical; treat with extreme caution. Ventilate area and flush thoroughly with plenty of running water.

Waste Disposal: Follow all federal, provincial and local regulations for disposal.

Handling Procedures and Equipment: VERY TOXIC, NEUROTOXIN, CARCINOGEN, MUTAGEN, REPRODUCTIVE TOXIN. Personnel working with this product must be thoroughly trained in its hazards and its safe use and must wear appropriate protective equipment and clothing. Prevent all eye and skin contact. Avoid generating or inhaling mist or dust. Use the smallest amount possible for the purpose, in an area with adequate ventilation. Keep work area clean and free from all extraneous materials. Use work surfaces that can be easily decontami-

nated. Empty containers will contain hazardous residues; treat with caution.

Storage Requirements: Store in sturdy, labelled containers (usually shipping containers), at a height convenient for handling. Store in a cool, dry, well-ventilated area, out of direct sunlight, and away from heat and ignition sources, and incompatible materials. Storage facilities should be made of fire-resistant materials, with raised sills and trenching to safe location. and with appropriate fire extinguishers and cleanup equipment nearby. Protect from damage and inspect frequently for damage or leaking.

FIRST AID MEASURES**Specific Measures:**

Eyes: Allow eyes to water naturally for a few minutes to dislodge particle. Do not allow victim to rub eyes. Wear protective gloves to avoid contact. Flush eyes with gently running water, holding eyelids open during flushing, for at least ten (10) minutes, or until no trace of chemical remains. Take care not to flush contaminated water into unaffected eye. If irritation persists, get medical attention.

Skin: Remove contaminated clothing under running water. Wear impervious gloves to avoid contact during first aid procedures. Immediately flush affected areas with soap and running water for at least ten (10) minutes, or until no trace of chemical remains. Obtain medical advice immediately. Completely decontaminate clothing before reuse. Discard contaminated shoes & leather goods.

Inhalation: IMMEDIATELY move victim to fresh air (caution must be observed by rescuers to avoid exposure). Give oxygen for breathing difficulty. Obtain medical advice immediately.

Ingestion: If victim is alert and NOT convulsing, give 1 to 2 glasses of water to dilute material. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain medical attention IMMEDIATELY.

Notes to Physician: Either acute or chronic exposure may lead to weak or absent reflexes, positive Romberg's sign, loss of vibration and position senses, numbness and tingling of the limbs, and peeling of the skin of the fingertips. **Antidote:** Pyridoxine (vitamin B6), pyruvate, and N-acetylcysteine have been used to reduce the toxicity of acrylamide in experimental studies, but are unproven.

REFERENCES USED

CCINFO disc: CCINFO

Budavari: The Merck Index, 12th ed., 1997

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 4A, 1991

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: October 15, 1999

Revision: November 2011

MSDS: 0732-6

WHMIS Designation: D1B; D2A

Prepared by: Caledon Laboratories Ltd. (905) 877-0101
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