



American International Chemical, Inc.

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MATERIAL SAFETY DATA SHEET

CUSTOM DCI 0.7M ACTIVATOR SOLUTION (0.7M 4,5-Dicyanoimidazole in 50:50 Acetonitrile:Toluene with 0.1M N-Methylimidazole)

SECTION 1 - CHEMICAL PRODUCT AND COMPANY INFORMATION

American International Chemical, Inc. 135 Newbury Street Framingham, MA 01701	Emergency Number: Chemtrec Information Number:	800-424-9300 703-527-3887 800-238-0001
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Date: April 2008

Synonyms: DCI Activator Solution, AB2965

CAS #: Not Applicable

DOT Hazard Class:

Flammable Liquid, Corrosive, N.O.S. (Contains Acetonitrile, Toluene, N-Methylimidazole)
(Custom 0.7M DCI Activator Solution)

Primary Hazard Class 3, Secondary Hazard class 8

UN2924

PG II

Label: Flammable Liquid, Corrosive

SECTION 2 - COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Acetonitrile	75-05-8	49-51%	Yes
Toluene	108-88-3	49-51%	Yes
4, 5-Dicyanoimidazole	1122-28-7	<1%	No
1-Methylimidazole	616-47-7	<1%	Yes

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A clear, colorless liquid that is highly flammable liquid and has a highly flammable vapor.

POTENTIAL HEALTH EFFECTS:

Skin: Will cause skin irritation and may cause burns.

Eyes: Will cause irritation and excessive tearing. Can cause burns.

Inhalation: May be harmful if inhaled.

Ingestion: Acetonitrile may cause tissue anoxia with symptoms of dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness, effects on heart rate, loss of coordination, cyanosis (causes blue coloring of the skin and nails from lack of oxygen), and coma.

CARCINOGENICITY: Not Identifiable

SECTION 4 - FIRST AID MEASURES

Skin: Immediately wash skin with soap and water for at least 15 minutes. Cover irritated skin with an emollient or anti-bacterial cream.

Eyes: Immediately flush with plenty of water for at least 15 minutes, holding eyelids apart.

Inhalation: Remove to the fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: Wash out mouth with water. Potential aspiration hazard. Do not induce vomiting.

On All Of The Above: Seek medical attention immediately.

SECTION 5 - FIRE FIGHTING MEASURES

Flash Point (Acetonitrile): 2 °C

Flammable Limits (Toluene): Lower Limit - 1.1 vol %, Upper Limit – 7.1 vol %

Extinguishing Media:

Use water spray, dry chemical, carbon dioxide, or appropriate foam. Solid streams of water may be ineffective and spread material.

Special Fire Fighting Procedures:

As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Toluene floats on water and may travel to a source of ignition and spread the fire. Water run-off can cause environmental damage and should be collected and confined.

Unusual Fire Explosion Hazard:

During a fire, irritating and highly toxic gasses may be generated by thermal decomposition or combustion.

Auto Ignition Temperature (Toluene): 480 °C

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Isolate hazard area and deny entry to unnecessary or unprotected personnel. Contain spilled liquid with sand or earth. Place in a disposal container. Avoid runoff into storm sewers and ditches which lead to waterways.

SECTION 7 - HANDLING AND STORAGE

Avoid contact with skin, eyes and clothing. Use with adequate ventilation. Avoid breathing vapor. Use normal personal hygiene and housekeeping. Store in cool dry area away from other incompatible materials.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved respirators.

VENTILATION REQUIREMENTS:

Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

SKIN AND EYE PROTECTION:

Use rubber or neoprene gloves, chemical goggles and clothing sufficient to protect skin and eyes from contact.

WORK, HYGIENIC PRACTICES:

As required to protect skin and eyes from contact, safety showers and/or eye wash should be available. Do not leave food or smoke in work area. Wash thoroughly and remove or clean any contaminated clothing.

EXPOSURE LIMITS:

Exposure Limits (Acetonitrile):

ACGIH – 20 ppm TWA; Skin – potential significant contribution to overall exposure by cutaneous route

NIOSH – 20 ppm TWA; 34 mg/m³ TWA; 500 ppm IDLH

OSHA Final PELs – 40 ppm TWA; 70 mg/m³ TWA

Exposure Limits (Toluene):

ACGIH – 20 ppm TWA

NIOSH – 100 ppm TWA; 375 mg/m³; 500 ppm IDLH

OSHA Final PELs – 200 ppm; 300 ppm Ceiling

OSHA Vacated PELs: 100 ppm TWA; 375 mg/m³

Exposure Limits (Dicyanoimidazole and Methylimidazole):

None established

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (Acetonitrile): 81.6 °C @ 760 mm Hg

Vapor Pressure (MM Hg): Not Available

Vapor Density (Acetonitrile) (AIR=1): 1.42

Specific Gravity (H₂O=1): Not Available

Percent Volatile by Volume (%): Not Available

Freezing/Melting Point (Acetonitrile): -45 °C

Evaporation Rate (Butyl Acetate=1): Not Available

Solubility in Water: Acetonitrile is soluble, other components are not.

pH: Not Available.

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under normal temperatures and pressures.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen cyanide, nitrogen oxides, carbon monoxide, carbon, dioxide.

KEEP AWAY FROM: Ignition sources, excess heat, exposure to moist air or water, confined spaces. Incompatibility with strong oxidizing agents, strong reducing agents, strong acids, nitric acid, sulfuric acid and carbon dioxide.

SECTION 11 - TOXICOLOGICAL INFORMATION

ACETONITRILE:

Routes of Entry: Inhalation, skin absorption, skin contact.

Animal Toxicity (RTECS):

Draize test, rabbit, eye: 100 uL/24H Moderate;

Inhalation, mouse: LC50 = 2693 ppm/1H;

Inhalation, rabbit: LC50 = 2828 ppm/4H;

Inhalation, rat: LC50 = 7551 ppm/8H;

Oral, mouse: LD50 = 269 mg/kg;

Oral, rabbit: LD50 = 50 mg/kg;

Oral, rat: LD50 = 2460 mg/kg;

Skin, rabbit: LD50 = 2000 mg/kg;

In a well-conducted study of mice, the oral LD50 of acetonitrile was calculated to be 617 mg/kg.

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Three volunteers were exposed for 4 hours at 40, 80, and 160 ppm acetonitrile. At 40 ppm, odor was detected, after which olfactory fatigue was noted. At this concentration, two persons had no signs of response, including no appreciable blood or urinary cyanide or thiocyanate. The third person experiences slight tightness in the chest that evening. A sensation of cooling in the lungs was observed and persisted for 24 hours. Traces of urinary thiocyanate were recorded.

Teratogenicity: In most of the available assays, teratogenicity was associated with maternal toxicity. In a well-conducted study, rats exposed by inhalation to acetonitrile did not result in significant fetal effects, even in concentrations that were overtly toxic to the dam. In this study, a maternal NOAEL of 1200 ppm and NOAEL of 1200 ppm with respect to developmental toxicity were established. A case-control study of pregnancy outcome among Finnish lab workers revealed no association between exposure to acetonitrile and increased risk of spontaneous abortion in mothers, or malformation and birth weight in their children.

Reproductive Effects: In relation to fertility, there is no information available in humans and there are no animal studies specifically investigating such effects. However, no changes were seen in weight of the right cauda or right testis and no effect on sperm motility in rats or mice exposed for 13 weeks with 100, 200, and 400 ppm to acetonitrile.

Mutagenicity: No information available.

Neurotoxicity: No information available.

TOLUENE:

Routes of Entry: Inhalation, skin absorption, skin contact

Animal Toxicity (RTECS):

Draize test, rabbit, eye: 870 ug Mild;

Draize test, rabbit, eye: 2 mg/24H Severe;
Draize test, rabbit, skin: 435 mg Mild;
Draize test, rabbit, skin: 500 mg Moderate;
Draize test, rabbit, skin: 20 mg/24 hr Moderate;
Inhalation, mouse: LC50 = 400 ppm/42H;
Inhalation, mouse: LC50 = 30,000 mg/m³/2H;
Inhalation, mouse: LC50 = 19,900 mg/m³/7H;
Inhalation, mouse: LC50 = 10,000 mg/m³;
Inhalation, rat: LC50 = 49 mg/m³/4H;
Oral, rat: LD50 = 636 mg/kg;
Skin, rabbit: LD50 = 14,100 mg/kg;

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: No information available.

Teratogenicity: In an epidemiological study of toluene and pregnancy, occupational exposures to toluene were said to be associated with an increased incidence of renal, urinary, gastrointestinal, and cardiac anomalies. Reduced fetal weight, effects on learning and memory, and hearing loss in males were observed in the off-spring of rats exposed by inhalation at levels that did not cause toxic affects in the mother.

Reproductive Effects: Many reports of reproductive effects of toluene abuse or heavy occupational exposure are confounded by mixed solvent exposure or fetal alcohol syndrome. In women exposed to toluene in lab work, the risk of spontaneous abortion increased 4.7 times.

Mutagenicity: No information available.

Neurotoxicity: No information available.

METHYLIMIDAZOLE:

Oral rat LD50: 1130 mg/kg;

Skin rabbit LD50: 400-640 mg/kg;

Oral mouse LD50: 1400 mg/kg (Behavioral remarks: Convulsions or effect on seizure threshold);

Intraperitoneal mouse LD50: 380 mg/kg (Behavioral remarks: Convulsions or effect on seizure threshold).

Chronic Exposure – Mutagen test: Histidine reversion (Ames)

SECTION 12 - ECOLOGICAL INFORMATION

ACETONITRILE:

Ecotoxicity:

Fish: Fathead minnow: 1150 ppm; 24 Hr; TLm (hard water);

Fish: Fathead minnow: 1000 mg/L; 96 Hr; TLm (soft water);

Fish: Bluegill/Sunfish: 1850 mg/L; 96 Hr; TLm (soft water);

Fish: Fathead minnow: 1640 mg/L; 96 Hr; LC50 (flow-bioassay);

Fish: Fathead minnow: 1640 mg/L; 96 Hr; EC50 (flow-bioassay) No data available;

Environmental Fate: Estimated Koc value = 16. Acetonitrile is expected to weakly adsorb to most soils based on the Koc value. Volatilization from soil surfaces and leaching into ground water is expected to be significant. Estimated BCF value = 0.3. This value indicates that acetonitrile will not significantly bioconcentrate in aquatic organisms or adsorb to suspended solids and sediments in water. Acetonitrile is unreactive towards photochemically generated free radicals and direct photolysis in the gaseous phase.

Special Remarks: Biodegradable

TOLUENE:

Ecotoxicity:

Bluegill: LC50 = 17 mg/L/24H;

Shrimp: LC50 = 4.3 ppm/96H;
Fathead minnow: LC50 = 36.2 mg/L/96H;
Sunfish (Fresh water): TLm = 1180 mg/L/96H

Environmental Fate: When released to soil, product is expected to evaporate and be microbially biodegraded. In water, product is expected to biodegrade and volatilize.

Physical: Photochemically produced hydroxyl radicals degrade this material.

METHYLIMIDAZOLE:

Environmental Toxicity: This material may be harmful to aquatic organisms due to shift of the pH.

Acute Ecotoxicity Tests:

LC50 Fish (*Leuciscus idus*) 96h 100-200 mg/l

EC50 Daphnia (*Daphnia Magna*) 48h 268mg/l

EC50 Algae (*Scenedesmus subspicatus*) 72h 180mg/l

SECTION 13 - DISPOSAL CONSIDERATIONS

Dispose of in accordance with all federal, state and local regulations.

RCRA WASTE #: Acetonitrile: U003; Toluene: U220

SECTION 14 - TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Flammable Liquid, Corrosive, N.O.S (Acetonitrile, Toluene, N-Methylimidazole)

TECHNICAL SHIPPING NAME: Flammable Liquid, Corrosive, N.O.S (Acetonitrile, Toluene, N-Methylimidazole)

U.N./NUMBER: UN2924

D.O.T. HAZARD CLASS AND GROUP NUMBER: Primary Hazard Class 3, Secondary Hazard class 8

D.O.T. PLACARD: Flammable Liquid, Corrosive

PRODUCT LABEL: Flammable Liquid, Corrosive, N.O.S. (Contains Acetonitrile, Toluene, N-Methylimidazole)

SECTION 15 - REGULATORY INFORMATION

OSHA STATUS: Not listed

TSCA STATUS: Listed

CERCLA REPORTABLE REQUIREMENTS (RQ): Acetonitrile: 5000 lbs; Toluene: 1000 lbs

SARA TITLE III INFORMATION:

Section 302 Extremely Hazardous Substance: Not listed

Section 313 Toxic Chemicals: Acetonitrile and Toluene are listed.

Section 311/312 Hazard Category:

Fire Hazard: Acetonitrile, Toluene

Acute Health Hazard (Immediate): Acetonitrile, Toluene

Chronic Health Hazard (Delayed): Acetonitrile

SECTION 16 - OTHER INFORMATION

National Fire Protective Association:

Estimated: Health – 3 Flammability - 3 Reactivity - 1

Reason for Issue: New Product

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