

# SAFETY DATA SHEET



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**All non-emergency numbers should be directed  
to Customer Service at 800-PURITY1**

## DIETHYLAMINE : ACETONITRILE BLEND

SDS No. M0231

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Diethylamine : Acetonitrile Blend

Synonyms: NA

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

### 2. HAZARDS IDENTIFICATION



**Classification:**

Flammable Liquids: GHS Category 2

Acute Toxicity, Oral: GHS Category 4

Acute Toxicity, Inhalation: GHS Category 4

Acute Toxicity, Dermal: GHS Category 3

Skin Irritation: GHS Category 1B

Eye Irritation: GHS Category 1

Respiratory Sensitization: GHS Category 1

Skin Sensitization: GHS Category 1

Acute Aquatic Toxicity: GHS Category 3

**Label Elements**

Signal Word: DANGER!

Hazard Statements:

H225 - Highly flammable liquid and vapor.

H302 - Harmful if swallowed.

H305 - May be harmful if swallowed and enters airways.

H315 - Causes skin irritation.

H317 - May cause an allergic skin reaction.

H319 - Causes serious eye irritation.

H332 - Harmful if inhaled.

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H402 - Harmful to aquatic life.

Precautionary Statements:

Clear focus. Consistent results. Complete confidence.

- P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
 P243 – Take precautionary measures against static discharge.  
 P273 – Avoid release to the environment.  
 P280 – Wear protective gloves/protective clothing/eye protection/face protection.  
 P284 – Wear respiratory protection.  
 P301+P310 – If SWALLOWED: Immediately call or POISON CENTER or a doctor/physician.  
 P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.  
 P304+P312 – IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

### **Emergency Overview**

May be fatal if swallowed, inhaled, or absorbed through the skin. Causes burns by all exposure routes. May metabolize to cyanide in the body. Highly flammable liquid and vapor. Vapor may cause flash fire. Target Organs: Cardiovascular system, central nervous system, liver, and kidneys.

### HMIS Rating:

Health – 3\* Flammability – 3 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

## **3. COMPOSITION AND INFORMATION ON INGREDIENTS**

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Acetonitrile	75-05-8	79-81%	Yes
Diethylamine	109-89-7	19-21%	Yes

## **4. FIRST-AID MEASURES**

Inhalation: If inhaled, remove to fresh air. If not breathing, begin artificial respiration, but DO NOT give mouth-to-mouth resuscitation. Get medical attention.

Ingestion: If swallowed, get medical attention immediately; DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Discard contaminated clothing and shoes.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Notes to Physician: Exposure should be treated as a cyanide poisoning. Effects may be delayed. For methemoglobinemia, administer oxygen alone or oxygen with Methylene Blue depending on the methemoglobin concentration in the blood. May be partially metabolized in the body. Always have a cyanide antidote kit on hand when working with cyanide compounds. Treat symptomatically and supportively.

## **5. FIRE FIGHTING MEASURES**

Flammability: Highly flammable liquid and vapor (GHS Category 2)

Auto-ignition Temperature: Information not available.

Flash Point: -23° C (-9° F) for Diethylamine

Flammable Limits: Lower Limit – 1.8 vol %, Upper Limit – 10.1 vol % for diethylamine

Products of Combustion: May decompose into toxic products under fire conditions (hydrogen cyanide, nitrogen oxides, carbon monoxide, carbon dioxide, amines).

Specific Fire Hazards: 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 may cause flash fire. 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.

Specific Explosion Hazards: None

Fire Fighting Media: For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. Water may be ineffective.

National Fire Protective Association (Estimated): Health - 3, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

## 6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Water can be used to create a non-flammable mixture. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

## 7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Protect from moisture.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion proof fans and exhaust systems. 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.

Personal Protection: Wear protective chemical goggles and face shield for eye and face protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits (Acetonitrile):

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

NIOSH – 20 ppm TWA; 34 mg/m<sup>3</sup> TWA; 500 ppm IDLH

OSHA Final PELs – 40 ppm TWA; 70 mg/m<sup>3</sup> TWA

Exposure Limits (Diethylamine):

ACGIH – 5 ppm TWA; Skin – potential significant contribution to overall exposure by cutaneous route

NIOSH – 10 ppm TWA; 30 mg/m<sup>3</sup> TWA; 200 ppm IDLH

OSHA Final PELs – 25 ppm TWA; 75 mg/m<sup>3</sup> TWA

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Sweetish, ethereal odor (acetonitrile) Or fishy ammonia like odor (diethylamine)

Odor Threshold: 170 ppm for acetonitrile, <1 ppm for diethylamine

Molecular Formula: CH<sub>3</sub>CN for acetonitrile, C<sub>4</sub>H<sub>11</sub>N for diethylamine

Molecular Weight: 41.05 for acetonitrile, 73.13 for diethylamine

Auto-ignition Temperature: Information not available

Flash Point: -23° C (-9° F) for Diethylamine

Flammable Limits: Lower Limit – 1.8 vol %, Upper Limit – 10.1 vol % for diethylamine

pH: Diethylamine is very alkaline.

Boiling Point: 81.6° C @ 760 mm Hg for acetonitrile, 55-58° C @ 760 mm Hg for diethylamine

Freezing/Melting Point: -45° C for acetonitrile, -50° C for diethylamine

Decomposition Temperature: > 500° C for acetonitrile

Specific Gravity: 0.7810 g/cm<sup>3</sup> for acetonitrile, 0.71 g/cm<sup>3</sup> for diethylamine

Vapor Density (Air=1): 1.42 for acetonitrile, 2.5 for diethylamine

Vapor Pressure: 88.8 mm Hg @ 25° C for acetonitrile, 195 mm Hg @ 20° C for diethylamine.

Viscosity: 0.36 cP 20° C for acetonitrile

Solubility: Acetonitrile is soluble, diethylamine is miscible in water.

## 10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat.

Incompatibility With Various Substances: Aldehydes, Alcohols, Dicyanofurazan, Ketones, phenols, Acids, Halogenated hydrocarbon, Oxidizing agents, Reducing Agents, Epoxides.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, amines.

Hazardous Polymerization: Will not occur

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Cause burns in respiratory tract, coughing, and pulmonary edema. Animal studies with diethylamine have shown lung, liver, and heart damage from overexposure. Acetonitrile breaks down slowly in the body releasing cyanide ion and very high concentrations may produce cyanide poisoning. Symptoms are usually delayed several hours and include stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways), headache, central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), muscle weakness, kidney effects, effects on heart rate, loss of coordination, cyanosis (causes blue coloring of the skin and nails from lack of oxygen), lung edema (fluid buildup in the lung tissue). Victims may have an irregular heartbeat and feel tightness in the chest. Severe overexposure may result in death.

INGESTION HAZARD: Causes gastrointestinal tract burns. 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. Severe overexposure may result in death. In single dose toxicity studies of acetonitrile by various routes, different animal species and different individuals of the same species displayed widely varying susceptibility.

SKIN CONTACT HAZARD: Causes skin burns. May be absorbed through the skin in harmful amounts. Absorbed acetonitrile may be metabolized into cyanide which inhibits cytochrome oxidase impairing cellular respiration.

EYE CONTACT HAZARD: Causes eye burns. Vapor may cause eye irritation.

Chronic Exposure Hazards: Chronic effects to diethylamine exposure may be similar to acute effects. Acetonitrile is toxic to blood kidneys, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, eyes, and central nervous system. It may be toxic to the reproductive system. Repeated or prolonged exposure can produce target organ damage. Repeated exposure may produce general deterioration of health in target organs. Acetonitrile may be metabolized to cyanide in the body which inhibits cytochrome oxidase impairing cellular respiration.

Animal Toxicity (Acetonitrile):

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.

Animal Toxicity (Diethylamine):

Inhalation, rat: LC50 = 4000 ppm/4H;  
 Oral, mouse: LD50 = 500 mg/kg;  
 Oral, rat: LD50 = 540 mg/kg;  
 Skin, rabbit: LD50 = 577 uL/kg;

Carcinogenicity: Neither component listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: (Diethylamine) Edema of the epithelium of the cornea, generally without pain, has been produced by amine vapors, causing colored halos to be seen around lights, usually in the evening, after industrial exposure to the vapors of various amines. (Acetonitrile) 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: (Acetonitrile) 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: Acetonitrile is classified as a toxin to the female reproductive system and suspected of being a toxin to the male reproductive system. Animal studies demonstrate that cyanide would cause toxic effects in the fetus at exposure levels that would be toxic to the parent. 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.

## 12. ECOLOGICAL INFORMATION

Ecotoxicity for Acetonitrile:

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 for Acetonitrile: 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. Biodegradable

Ecotoxicity for Diethylamine:

Fish: Rainbow Trout: LC50 = 25-198 mg/L, 96H  
 Water flea: Daphnia: EC50 = 56 mg/L, 48H  
 Algae: Green Algae: EC50 = 20 mg/L, 96H

Environmental Fate for Diethylamine:

Readily biodegradable. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

### 13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. Acetonitrile is a "U" listed waste (U003 – ignitable, toxic waste).

### 14. TRANSPORT INFORMATION

#### US DOT

Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Acetonitrile, Diethylamine)

Hazard Class: 3(8)

UN Number: UN2924

Packing Group: II

#### IDMG

Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Acetonitrile, Diethylamine)

Hazard Class: 3(8)

UN Number: UN2924

Packing Group: II

#### IATA

Proper Shipping Name: Flammable Liquid, Corrosive, n.o.s. (Acetonitrile, Diethylamine)

Hazard Class: 3(8)

UN Number: UN2924

Packing Group: II

### 15. REGULATORY INFORMATION

#### US Federal Regulations:

CERCLA Hazardous Substances: CAS# 75-05-8 – 5000 lb final RQ; 2270 kg final RQ; CAS#109-89-7 – 100 lb final RQ; 45.4 kg final RQ

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 75-05-8 and CAS#109-89-7 – immediate, delayed, fire

Section 313: Acetonitrile (CAS# 75-05-8) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

OSHA: Not considered highly hazardous by OSHA.

#### US State Regulations:

CAS# 75-05-8 and CAS#109-89-7 are on the following state right-to-know lists: New Jersey, Pennsylvania, Minnesota, and Massachusetts

### 16. OTHER INFORMATION

Originally Prepared: 6/18/2008

Last Revised: 12/1/2015 – Updated information for eye and face protection in Section 8.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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