

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Acetonitrile**

Product Code: Acetonitrile

Synonyms: Methyl Cyanide; Cyanomethane; Ethanenitrile; Ethyl nitrile

CAS Number: 75-05-8

Company Identification: **NuGeneration Technologies, LLC**
 100 Professional Center Drive
 Rohnert Park, CA 94928

www.nugentec.com/biotech

1-707-820-4080 (For product information) 1-800-424-9300 (For emergencies - CHEMTREC)

2. COMPOSITION / INFORMATION ON INGREDIENTS

CONTAINING: HAZARDOUS AND/OR REGULATED COMPONENTS

<u>Chemical Name</u>	<u>Amount</u>	<u>CAS Number</u>	<u>Hazardous</u>	<u>OSHA PEL (ppm)</u>	<u>ACGIH TLV (ppm)</u>
Acetonitrile	100%	75-05-8	YES	40	20

COMPOSITION COMMENT: --

***California Prop 65:** This product does contain an ingredient(s), above the safe harbor limits, which are known to the state of California to cause cancer, birth defects, or other reproductive harm.

HAZARDS DISCLOSURE: This product contains known hazardous materials in reportable levels as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200 except as listed above. As defined under Sara 311 and 312, this product contains known hazardous materials.


3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. FLAMMABLE LIQUID AND VAPOR. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.



Hazardous Material Information System (HMIS):	Health	3
	Flammability	3
	Reactivity	1
	Personal Protection	H

National Fire Protection Association (NFPA):	
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NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

Protective Equipment: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER.

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Skin contact. Eye contact. Inhalation. Ingestion.

TARGET ORGANS: Kidneys, central nervous system, liver, respiratory system, cardiovascular system, eyes.

INHALATION: May cause respiratory tract irritation. May cause lung damage. May be harmful if inhaled.

Acetonitrile breaks down slowly in the body to release the cyanide ion. Exposure to very high concentrations of acetonitrile can result in cyanide poisoning. Symptoms are usually delayed several hours after exposure. Early symptoms include weakness, headache, giddiness, dizziness, confusion, anxiety, nausea and vomiting. In severe cases, breathing is rapid, then becomes slow and gasping. The victim may feel an irregular heart beat and tightness in the chest.

INGESTION: May cause tissue anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma, and death. Metabolism may release cyanide, which may result in headache, dizziness, weakness, collapse, unconsciousness, and possible death.

SKIN CONTACT: Causes mild skin irritation. If absorbed, causes symptoms similar to those of inhalation. May be harmful if absorbed through the skin. May be metabolized to cyanide which in turn acts by inhibiting cytochrome oxidase impairing cellular respiration.

EYE CONTACT: Causes eye irritation. Lachrymator (substance which increases the flow of tears). May produce superficial reversible injury.

CHRONIC EXPOSURE: May be metabolized to cyanide which in turn acts by inhibiting cytochrome oxidase impairing cellular respiration. Exposure to small amount of cyanide compounds over long periods of time is reported to cause loss of appetite, headache, weakness, nausea, dizziness, and symptoms of irritation of the upper respiratory tract and eyes. Animal studies indicate that the product may affect the liver and kidneys. Animal evidence for acetonitrile and other cyanide compounds clearly indicates that toxic effects would be expected in the fetus at exposure levels which are toxic to the fetus.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Persons with skin disorders, or impaired liver, or pulmonary function may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

INHALATION FIRST AID: If a respiratory problem develops from vapors. Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

SKIN CONTACT FIRST AID: Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

EYE CONTACT FIRST AID: If contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

INGESTION FIRST AID: Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

STATEMENT OF PRACTICAL TREATMENT: Always have plenty of water available for first aid. Get medical attention if any symptoms develop or persist.

For acute or short-term repeated exposures to acetonitrile:

Exposure should be treated as a cyanide poisoning. Effects may be delayed. For methemoglobinemia, administer oxygen alone or with Methylene blue depending on the methemoglobin concentration in the blood. May be partially metabolized to cyanide in the body.

Antidote: Always have a cyanide antidote kit on hand when working with cyanide compounds. Get medical advice to use. Methylene blue, alone or in combination with oxygen is indicated as a treatment in nitrile induced methemoglobinemia.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: FLAMMABLE!

AUTO IGNITION TEMPERATURE: 524 °C (975.20 °F) **FLASH POINT:** Flash point: 2C (35.60F) CC
FLAMMABLE LIMITS IN AIR, % by Volume: lel: 3.0; uel: 16.0

EXTINGUISHING MEDIA: Carbon dioxide, alcohol foam, dry chemical extinguishers. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

FIRE & EXPLOSION HAZARDS: Above the flash point, explosive vapor-air mixtures may be formed. Flammable vapors that are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flashback along vapor trail may occur. May be detonated if confined and heated, or by shock from high explosives. Fire and explosion hazard when under pressure. Sensitive to static discharge.

SPECIAL INFORMATION:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Do not approach containers suspected to be hot.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. Follow applicable OSHA regulations (29 CFR 1910.120).

7. HANDLING AND STORAGE

RECOMMENDED STORAGE CONDITIONS: Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Protect storage area from exposure to external fires. After this container has been emptied, it may contain explosive vapors; observe all warnings and precautions listed for the product. Do not cut, or weld on or near this container. Protect storage area and processing vessels from high energy projectiles by a suitable barricade. Separate from flammables and sensitizers. Do not reuse or dispose of empty containers until they have been rinsed with water. DO NOT enter confined spaces until atmosphere has been checked.

SHELF LIFE: See Label on packaging.

HANDLING (PERSONNEL): Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, bare lights, heat or ignition sources. When handling, DO NOT eat, drink or smoke. Vapor may ignite on pumping or pouring due to static electricity. DO NOT use plastic buckets. Ground and secure metal containers when dispensing or pouring product. Use spark-free tools when handling. Avoid contact with incompatible materials. Keep containers securely sealed. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practices. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS: See Section 2 above.

Acetonitrile:

- OSHA Permissible Exposure Limit (PEL): 40 ppm (TWA)
- ACGIH Threshold Limit Value (TLV): 20 ppm (TWA)

VENTILATION SYSTEM: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Use explosion proof ventilation equipment. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

PERSONAL RESPIRATORS (NIOSH APPROVED): If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airtight hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134) and (ANSI Z88.2) requirements. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

RESPIRATORY PROTECTION:

Exposure Range >1000 to <2500 ppm: Supplied Air, Constant Flow/Pressure Demand, Full Face

Exposure Range 2500 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face

Note: use ov (black) cartridge for nuisance(<1000)

SKIN PROTECTION: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

EYE PROTECTION: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Clear, colorless, volatile liquid.

ODOR: Sweetish odor – ethereal odor

SOLUBILITY IN WATER: Soluble

MELTING/FREEZING POINT: -45°C

AUTO IGNITION TEMPERATURE:

pH: N/A

% VOLATILES BY VOLUME @ 21C (70F): 100

Molecular weight: 41.05

COLOR: Clear / colorless

BOILING POINT: 81.6°C @ 760 mm Hg

SPECIFIC GRAVITY: 7810g/cm³

Evaporation Rate (BuAc=1): 5.79

FLASH POINT: 2.0C (35.6°F) CC

VAPOR PRESSURE: 88.8 mm Hg @ 25C

VAPOR DENSITY: 1.42 (air = 1)

Molecular Formula: CH₃CN

10. STABILITY AND REACTIVITY

STABILITY: Product is considered stable.

CONDITIONS TO AVOID: Heat, flames, ignition sources and incompatibles.

POLYMERIZATION: Hazardous polymerization will not occur.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid storage with oxidizers, strong acids and strong reducing agents.

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

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Acetonitrile – Draize test, rabbit, eye 100uL/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 = >2 gm/kg.

Carcinogenicity:

Carcinogenic effects: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Mutagenic effects: Not available.

Teratogenic effects: Not available.

Cancer Lists

Ingredient

Acetonitrile (75-05-8)

---NTP Carcinogen---

Known

No

Anticipated

No

IARC Category

None

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE: Estimated Koc value = 16. Acetonitrile is expected to weakly absorb 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 absorb to suspended soils and sediments in water. Acetonitrile is unreactive towards photochemically-generated free radicals and direct photolysis in the gaseous phase.

ENVIRONMENTAL TOXICITY: Fish: Fathead minnow: 1150 ppm; 24Hr; 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; LC 50 (flow-bioassay) Fish: Fathead Minnow: 1640 mg/L; 96 Hr; EC 50 (flow-bioassay) No data available.

Other: Biodegradable

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Whatever cannot be saved for recovery or recycling should be handled as a non hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of material in accordance with federal, state and local requirements. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3.

RCRA P-Series: None Listed

RCRA U-Series:

CAS# 75-05-8: waste number U003(Ignitable waste, Toxic waste)

CONTAMINATED MATERIALS: Wash contaminated clothing before reuse.

14. TRANSPORTATION INFORMATION

Domestic (Land, D.O.T.), International (Water, I.M.O.), International (Air, I.C.A.O.)

CLASS: 3 – Flammable Liquid
PRODUCT LABEL: Acetonitrile
UN NUMBER: 1648
PACKING GROUP: II – Medium Danger
D.O.T. SHIPPING NAME: ACETONITRILE - Flammable Liquids, N.O.S.
PRODUCT RQ (LBS): 5,000 lbs (2268 kg)
ERG Guide Number: N/A
SUPPLEMENTAL HAZARD: N/A
SPECIAL PROVISIONS: None
Packaging: Exceptions: N/A
Quantity Limitations: Passenger aircraft: 1 L Cargo aircraft only: 60 L
Vessel Stowage: Location: B



15. REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

Chemical Inventory Status - Part 1

Ingredient Acetonitrile	<u>TSCA</u> YES	<u>EC</u> YES	<u>Japan</u> YES	<u>Australia</u> YES
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Chemical Inventory Status - Part 2

Ingredient Acetonitrile	<u>Korea</u> YES	<u>DSL</u> YES	<u>CANADA</u> <u>NDSL</u> YES	<u>Phil.</u> YES
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Federal, State & International Regulations - Part 1

	<u>-SARA 302-</u>		<u>-SARA 313-</u>
Ingredient Acetonitrile	<u>RQ</u> NO	<u>TPQ</u> NO	<u>Chemical Catalog</u> YES
			<u>List</u> YES

Federal, State & International Regulations - Part 2

	<u>CERCLA</u>		<u>-RCRA-</u>		<u>-TSCA-</u>
Ingredient Acetonitrile	5000		<u>261.33</u> U003		<u>8(d)</u> YES

Chemical Weapons Convention: No **TSCA 12(b):** No **CDTA:** Yes

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No

Reactivity: No (Pure / Liquid)

STATE REGULATIONS:

Pennsylvania RTK: Acetonitrile: YES

Massachusetts RTK: Acetonitrile: YES

New Jersey: Acetonitrile: YES

PROP 65 - WARNING: NONE

THIS PRODUCT DOES NOT CONTAIN A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

RCRA 40 CFR: Listed U002 Ignitable Waste, Tonic Waste.

Australian Hazchem Code:

Poison Schedule: None allocated.

WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

This material or all of its components are listed on the Inventory of Existing Chemical Substances under the Toxic Substance Control Act (TSCA). This material or all of its components are listed on the Canadian Domestic Substances List (DSL). This material or all of its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical Substances (EINECS). Other inventory lists:, Korea (TCCL), Australia (AICS), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

16. OTHER INFORMATION

Label Requirements: DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. FLAMMABLE LIQUID AND VAPOR. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

Prepared By: Donato Polignone
Approved By: NuGeneration Technologies, LLC, Environmental Health and Safety Department
Approval Date: October 20, 2009

Part Number: Acetonitrile
Supersedes Date: 03/12/2006

ADDITIONAL INFORMATION:

The data in this Material Safety Data Sheet relates only to the specific material designated herein. It does not relate to use in combination with any other material or in any process. This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-2004)

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END OF MSDS