

MSDS – MATERIAL SAFETY DATA SHEET

From: Ashonuj Chem Pvt. Ltd.

Fact. Tel: +91-22-27781956

43, Princess Street, 3 Devkaran Mansion, Off Tel: +91-22-22084293

1st Floor, Mumbai – 400 002. INDIA.

ACETONITRILE

1. Product Identification

Synonyms: Methyl Cyanide; Cyanomethane; Ethanenitrile; Ethyl nitrile

CAS No.: 75-05-8

Molecular Weight: 41.05

Chemical Formula: CH₃ CN

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
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Acetonitrile	75-05-8	99.8 - 100%	Yes
Acrylonitrile	107-13-1	< 0.001%	No

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.

SAFETY DATA Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

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

Storage Color Code: Red (Flammable)

Potential Health Effects

In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings.

Inhalation:

Effects of overexposure are often delayed, possibly due to the slow formation of cyanide anions in the body. These cyanide anions prevent the body from using oxygen and can lead to internal asphyxiation. Early symptoms may include nose and throat irritation, flushing of the face, and chest tightness. Higher concentrations may produce headache, nausea, vomiting, respiratory depression, weakness, blood changes, thyroid changes, irregular heart beat, abdominal pain, convulsions, shock, unconsciousness and death, depending on concentration and time of exposure. This highly toxic material has insufficient warning properties to prevent personnel from working in contaminated atmospheres.

Ingestion:

Gastric irritation may occur. Other symptoms parallel those from inhalation exposure.

Skin Contact:

May cause irritation. May be absorbed through skin with health effects to parallel those of inhalation.

Eye Contact:

Splashes may cause eye irritation with redness and pain.

Chronic Exposure:

Long term exposures may affect liver, kidneys, and central nervous system.

Aggravation of Pre-existing Conditions:

Workers using cyanide should have preplacement and periodic medical exams. Those with history of central nervous system, heart or lung diseases, or liver, kidney, or thyroid problems may be more susceptible to the effects of this substance.

4. First Aid Measures

FOLLOWING ANY ROUTE OF EXPOSURE GET MEDICAL ATTENTION IMMEDIATELY. SERIOUS TOXICITY IS PRECEDED BY VOMITING IN MOST CASES OF ORAL INGESTION.

Although used in pre-hospital management of cyanide poisoning, amyl nitrite inhalants have not been shown to be beneficial in managing acetonitrile poisoning.

Inhalation:

If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental

oxygen. If not breathing, begin artificial respiration. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION.

Ingestion:

If swallowed, get medical attention immediately; do not induce vomiting. Never give anything by mouth to an unconscious person. If not breathing, begin artificial respiration. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

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

Note to Physician:

Any patient with ingestion or other significant exposure to acetonitrile should be observed in the intensive care unit for 24 hours.

In-Hospital Management:

Consider gastric lavage if patient is presented soon after ingestion. Administer charcoal slurry with or without saline cathartic or sorbitol. Immediately begin therapy with 100% oxygen. Observe for respiratory depression, seizures, hypotension or pulmonary edema. Acetonitrile metabolizes into cyanide over 2 to 8 hours, so symptoms or signs of toxicity may be delayed after significant exposures. Consider cyanide antidote as clinically indicated, such as sodium thiosulfate and sodium nitrate. Monitor cyanide levels, arterial blood gases, and acid-base balance.

5. Fire Fighting Measures

Fire:

Flash point: 2C (36F) CC

Autoignition temperature: 524C (975F)

Flammable limits in air % by volume:

lcl: 4.4; ucl: 16.0

Flammable Liquid and Vapor! Contact with strong oxidizers may cause fire.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

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. 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. May emit toxic and flammable fumes of cyanide if involved in a fire.

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. Spills can be reacted in an alkaline hypochlorite solution to produce cyanate and then neutralized.

7. Handling and Storage

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. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Acetonitrile:

-OSHA Permissible Exposure Limit (PEL):

40 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

20 ppm (TWA), skin, A4 - not classifiable as a human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. 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, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. 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.

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

Appearance: Clear, colorless liquid.

Odor: Ether odor.

Solubility: Miscible in water.

Specific Gravity: 0.79 @ 15C/4C

pH: No information found.

% Volatiles by volume @ 21C (70F): 100

Boiling Point: 81.6C (180F)

Melting Point: -46C (-51F)

Vapor Density (Air=1): 1.4

Vapor Pressure (mm Hg): 73 @ 20C (68F)

Evaporation Rate (BuAc=1): 5.79

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Burning may produce fumes of cyanide, carbon monoxide, carbon dioxide, nitrogen oxides and sulfur oxides.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Incompatible with oxidizing materials, sulfuric acid, oleum, chlorosulfonic acid, n-fluoro compounds, nitrating agents and perchlorates.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 2460 mg/kg; skin rabbit LD50: 1250 uL/kg; inhalation rat LC50: 7551 ppm/8H.

Investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
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Acetonitrile (75-05-8)	No	No	None
Acrylonitrile (107-13-1)	No	Yes	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is not expected to react with photochemically produced hydroxyl radicals. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material is expected to have a half-life of greater than 30 days.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA 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 container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ACETONITRILE
Hazard Class: 3
UN/NA: UN1648
Packing Group: II
Information reported for product/size: 2.5L

International (Air, I.C.A.O.)

Proper Shipping Name: ACETONITRILE
Hazard Class: 3
UN/NA: UN1648
Packing Group: II
Information reported for product/size: 2.5L

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----
Ingredient TSCA EC Japan Australia

Acetonitrile (75-05-8) Yes Yes Yes Yes
Acrylonitrile (107-13-1) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----
Ingredient Korea DSL NDSL Phil.

Acetonitrile (75-05-8) Yes Yes No Yes
Acrylonitrile (107-13-1) Yes Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----
Ingredient -SARA 302- -SARA 313-----
RQ TPQ List Chemical Catg.

Acetonitrile (75-05-8) No No Yes No
Acrylonitrile (107-13-1) 100 10000 Yes No

-----\Federal, State & International Regulations - Part 2\-----
Ingredient CERCLA -RCRA- -TSCA-
261.33 8(d)

Acetonitrile (75-05-8) 5000 U003 No
Acrylonitrile (107-13-1) 100 U009 No

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

SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2WE

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.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 3 Reactivity: 0

Label Hazard Warning:

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.

Label Precautions:

Do not breathe vapor or mist.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat, sparks and flame.

Label First Aid:

IN ALL CASES, CALL A PHYSICIAN IMMEDIATELY. DO NOT GIVE MOUTH-TO-MOUTH RESUSCITATION. Emergency response personnel must take precautions to avoid contact with this substance. If inhaled, remove to fresh air. Monitor for respiratory distress. If not breathing give artificial respiration. If cough or difficulty in breathing develops, administer 100% supplemental oxygen, as required. If swallowed, get medical attention immediately; do not induce vomiting. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Product Use: Laboratory Reagent.

Revision Information: No Changes.

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