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## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Acrylonitrile, Inhibited  
**Synonyms:** None  
**Product Description:** Acrylonitrile  
**Intended/Recommended Use:** Building block chemical

**Supplied By:** CYTEC CANADA INC., 9061 GARNER ROAD  
NIAGARA FALLS, ONTARIO, CANADA L2E 6S5 1-905/356-9000

**Manufactured By:** CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,  
WEST PATERSON, NEW JERSEY 07424, USA - 973/357-3100

**EMERGENCY PHONE (24 hours/day) - For emergency involving spill, leak, fire, exposure or accident call:**

**Asia Pacific Region:**

Australia - +61-3-9663-2130 or 1800-033-111  
China (PRC) - +86(0)532-8388-9090 (NRCC)  
New Guinea - +61-3-9663-2130  
New Zealand - +61-3-9663-2130 or 0800-734-607  
All Others - +65-633-44-177 (CareChem24 Singapore)

**Canada:** 1-905-356-8310 (Cytec Welland, Canada plant)

**Europe/Africa/Middle East:** +44-(0)208-762-8322 (CareChem24 UK)

**Latin America:**

Brazil - 0800 0111 767 (SOS Cotec)  
Chile - +56-2-247-3600 (CITUC QUIMICO)  
All Others - +52-376-73 74122 (Cytec Atequiza, Mexico plant)

**USA:** +1-703-527-3887 or 1-800-424-9300 (CHEMTREC)

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### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### WHMIS REGULATED COMPONENTS

Component / CAS No.	% (w/w)	OSHA (PEL):	ACGIH (TLV)	Carcinogen
Acrylonitrile 107-13-1	99.5 - 99.7	2 ppm (TWA) 10 ppm (Ceiling) 2 ppm (TWA) 10 ppm (Excursion Limit) 1 ppm (Action Level)	2 ppm (TWA) (skin)	IARC 2B NTP OSHA ACGIH A3

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

### 3. HAZARDS IDENTIFICATION

#### APPEARANCE AND ODOR:

Color: colorless to light-yellow or blue-green  
Appearance: liquid  
Odor: pungent

#### STATEMENTS OF HAZARD:

DANGER! FLAMMABLE LIQUID AND VAPOR  
MAY BE FATAL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED  
LIQUID PENETRATES LEATHER CAUSING DELAYED BURNS  
CAUSES EYE AND SKIN IRRITATION  
MAY CAUSE ALLERGIC SKIN REACTION  
POLYMERIZATION MAY OCCUR FROM EXCESSIVE HEAT OR CONTAMINATION

#### CHRONIC HAZARD WARNING:

CONTAINS ACRYLONITRILE (AN)  
CANCER HAZARD

ACRYLONITRILE CAUSED REPRODUCTIVE DISORDERS AND BIRTH DEFECTS IN LABORATORY ANIMAL TESTS  
Risk depends on duration and level of exposure

#### POTENTIAL HEALTH EFFECTS

##### EFFECTS OF EXPOSURE:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited. Dermal contact may produce moderate irritation or delayed blistering. Repeated or prolonged dermal contact with this material may cause allergic skin reactions. Direct eye contact may cause moderate to severe irritation. Based on animal evidence, chronic exposure to this material may cause cancer. Refer to Section 11 for toxicology information on the regulated components of this product.

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### 4. FIRST AID MEASURES

#### Ingestion:

If swallowed, get medical attention immediately. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

#### Skin Contact:

Wash immediately with plenty of water and soap. Remove contaminated clothing and shoes without delay. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware. Get medical attention if pain or irritation persists after washing or if signs and symptoms of overexposure appear.

#### Eye Contact:

Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.

#### Inhalation:

Remove to fresh air. Obtain medical attention immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Notes To Physician:**

ANTIDOTE - Call a physician at once. Start treatment immediately. Break an amyl nitrite pearl in a cloth and hold lightly under nose for 15 seconds. Administer oxygen for 15 seconds. Repeat amyl nitrite and oxygen administration alternately five times at about 15 second intervals. Continue to administer oxygen alone until physician arrives. Personnel trained and competent in intravenous antidote therapy for this material should refer to the Notes to Physician and continue treatment as appropriate. Persons with mild exposure without loss of consciousness recover spontaneously. Greater exposure may result in loss of consciousness, convulsion and death as in cyanide poisoning. If patient has not fully responded to amyl nitrite and oxygen therapy, inject intravenously 10 milliliters of a 3% solution of sodium nitrite at a rate no greater than 2.5 to 5.0 milliliters per minute. Follow directly with 50 milliliters of a 25% solution of sodium thiosulfate at the same rate by the same route. (The same needle and vein may be used if feasible.) If signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections on hour later at on-half the original doses. Oxygen therapy should be continued as indicated. Patient should be closely monitored in a hospital setting as other serious complications (such as but not limited to methemoglobinemia and/or disturbances of acid base balance) may occur. If induction of vomiting and/or gastric lavage is clinically indicated, take adequate measures to protect the airway to prevent aspiration.

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## 5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media:**

This material is flammable and will be easily ignited by heat, sparks or flame. For small fires, use water spray, carbon dioxide or dry chemical to extinguish fires. For large fires, use water spray, fog or alcohol foam to extinguish fires. Move containers from fire area if it can be done without risk. Water spray may be ineffective as an extinguishing agent, but can be used to cool containers and disperse vapors. Do not use a solid stream of water, since the stream will scatter and spread the fire. Dike fire control water for later disposal; do not scatter the material. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out.

**Protective Equipment:**

Wear self-contained, positive pressure breathing apparatus and full firefighting protective clothing for fire situations only. Structural firefighter's protective clothing is recommended for fire situations only and is not effective in spill situations - See Section 6 (Accidental Release Measures).

**Special Hazards:**

Vapors may travel to source of ignition and flash back. Most vapors are heavier than air and will spread along the ground and collect in low or confined areas such as sewers or basements. These vapors may present an explosion or toxicity hazard. If tank, rail car, tank truck or other large quantity of material is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions and consider initial evacuation for 800 meters (1/2 mile) in all directions. Elevated temperatures or contamination may cause material to polymerize causing a pressure buildup that may violently rupture tanks or containers. In the event this material begins to polymerize, isolate the area, use water fog or spray to control vapors. Take defensive actions only. Let the reaction run its course. Once the reaction is complete, follow normal precautions for this material.

**Mechanical/Static Sensitivity Statements:**

Nitrogen blanketing of tanks will reduce potential flammability of vapors above the liquid. Use non-sparking tools when opening or closing metal containers. Containers must be bonded and grounded when pouring or transferring material. Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection codes (NFPA-30) governing Class I Flammable Liquids. Store in tightly closed containers in a cool, well-ventilated area away from heat, sparks and flames.

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## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:**

Refer to Section 8 (Exposure Controls/Personal Protection) for appropriate personal protective equipment. Wear recommended, full facepiece, positive pressure self-contained breathing apparatus. Where exposure level is known, wear approved respirator suitable for level of exposure. Wear full impervious protective clothing to prevent all skin contact, including the head, face, hands and feet. Wear chemical splash proof goggles or faceshield. For larger spills, protective clothing should include flash protection. A full facepiece respirator will provide the necessary eye protection.

**Methods For Cleaning Up:**

Evacuate area. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Isolate the spill or leak area immediately. Keep unauthorized personnel away, upwind and out of low areas. Ventilate enclosed areas. For larger spills, the area should be isolated for at least 100 to 200 meters (330 to 660 feet) in all directions. Do not touch or walk through spilled material. Stop leak if possible if it can be done without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb smaller spills with earth, sand or other non-combustible material and transfer to containers for later disposal. Use non-sparking handtools. For larger spills, dike spill area. Control vapors by applying a layer of alcohol-resistant foam. Reapply the foam as necessary to maintain coverage. Using appropriate equipment for flammables, transfer as much of the material as possible into suitable containers. The remaining residue may be neutralized with a 5-10% aqueous solution of sodium metabisulfite. Dispose of neutralized residue according to applicable governmental regulations. Call the Emergency Phone if assistance is required.

**Environmental Precautions:**

Avoid release to the environment.

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## 7. HANDLING AND STORAGE

### HANDLING

**Precautionary Measures:** Keep away from heat, sparks and flame. Do not get in eyes, on skin or on clothing. Do not breathe vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Do not wear contact lenses when working with this chemical. Avoid elevated temperatures and contamination by any source. Always have on hand a cyanide resuscitation kit and oxygen respiratory equipment.

**Special Handling Statements:** Always have on hand an appropriate antidote for Acrylonitrile such as the standard cyanide antidote kit. In addition to its potential health effects, acrylonitrile is a flammable, reactive material. Improper handling may cause fire, explosion and other exothermic (heat producing) reactions. Nitrogen blanketing of tanks will reduce potential flammability of vapors above the liquid. Use non-sparking tools when opening or closing metal containers. Containers must be bonded and grounded when pouring or transferring material. Acrylonitrile is very reactive and must be kept away from strong oxidizers (especially bromine), strong acids or bases, copper, copper alloys, ammonia, amines and sodium hydroxide (caustic soda) solutions. Contact with these materials may cause a vigorous chemical reaction which generates heat and pressure, possibly resulting in fire or explosion. Acrylonitrile can self-polymerize, also releasing heat and pressure, possibly resulting in fire or explosion. To prevent accidental polymerization, this material is shipped inhibited (stabilized).

### STORAGE

Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection codes (NFPA-30) governing Class I Flammable Liquids. Store in tightly closed containers in a cool, well-ventilated area away from heat, sparks and flames. Never store uninhibited AN. Avoid storing at elevated temperatures. Store at ambient or sub-ambient temperatures. Packaged material should be used within six months. Uncontaminated acrylonitrile can be stored safely at temperatures up to 60 C (140 F) for up to six months. For further information consult OSHA Standard for AN (29 CFR Section 1910.1045).

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Measures:**

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure. Eyewash fountains and safety showers should be available where this material is handled.

**Respiratory Protection:**

Where adequate engineering controls are in effect, and measurements confirm airborne concentrations are below the permissible exposure level, no respiratory protection is required. Full facepiece, positive pressure, supplied air respirators or self-contained breathing apparatus must be used. If the exposure level is known, an approved respirator suitable for the level of exposure can be worn. Acrylonitrile cannot be smelled below 13-19 ppm its odor threshold. If you smell acrylonitrile, move to fresh air immediately.

**Eye Protection:**

For operations where eye and face contact with this material can occur, wear head covering and chemical splash proof goggles or faceshield. A full facepiece respirator will provide the necessary eye protection.

**Skin Protection:**

For operations where skin contact with this material can occur, wear impervious gloves (e.g. PVC or nitrile), rubber or neoprene shoes or boots (leather is unsuitable unless covered) and impervious disposable coveralls that provide head, arm and foot protection from contact with this material. Wash protective equipment thoroughly before removing.

**Additional Advice:**

Food, beverages and tobacco products must not be carried, stored or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Shower after completion of workshift. Launder work clothing at end of workshift, prior to reuse. Store street clothing separately from work clothing and protective equipment. Work clothing and shoes must not be taken home. Refer to OSHA Acrylonitrile Standard (29 CFR 1910.1045). This standard includes very specific requirements for monitoring and exposure control.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Color:</b>	colorless to light-yellow or blue-green
<b>Appearance:</b>	liquid
<b>Odor:</b>	pungent
<b>Boiling Point:</b>	77 °C      171 °F
<b>Melting Point:</b>	-82 °C      -116 °F
<b>Vapor Pressure:</b>	84mm Hg @ 20 °C
<b>Specific Gravity/Density:</b>	0.81 @ 20 °C
<b>Vapor Density:</b>	1.83(air = 1)
<b>Percent Volatile (% by wt.):</b>	100
<b>pH:</b>	Not applicable
<b>Saturation In Air (% By Vol.):</b>	11.1 @ 20 C, 760 mm Hg
<b>Evaporation Rate:</b>	4.54(Butyl acetate = 1) @ 20 C
<b>Solubility In Water:</b>	7.4% @ 20 °C
<b>Volatile Organic Content:</b>	Not available
<b>Flash Point:</b>	-1 °C      30 °F      Closed Cup
<b>Flammable Limits (% By Vol):</b>	Lower: 3.0      Upper: 17.0
<b>Autoignition Temperature:</b>	481 °C      898 °F
<b>Decomposition Temperature:</b>	~200 °C      392 °F      Onset of polymerization/decomposition
<b>Partition coefficient (n-octanol/water):</b>	Log Pow = 0.0 to 0.30
<b>Odor Threshold:</b>	Not available

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## 10. STABILITY AND REACTIVITY

**Stability:** Stable

**Conditions To Avoid:** Acrylonitrile is very reactive and must be kept away from strong oxidizers (especially bromine), strong acids or bases, copper, copper alloys, ammonia, amines and sodium hydroxide (caustic soda) solutions. See Incompatible Materials. Contact with these materials may cause a vigorous chemical reaction which generates heat and pressure, possibly resulting in fire or explosion.

**Polymerization:** May occur

**Conditions To Avoid:**

Avoid elevated temperatures >200 C (>392 F), contact with light and contamination with polymerization catalysts such as free radical initiators (peroxides, sulfides or redox systems), bases or amines. See Incompatible Materials. To help prevent accidental polymerization, acrylonitrile is provided with an inhibitor system. This system consists of 35-45 ppm MEHQ (Methyl ether of hydroquinone) and 0.2-0.5% water. Monthly analyzes to verify inhibitor system integrity are recommended. This inhibitor system becomes ineffective in the absence of oxygen. Nitrogen blanketing of tanks to air levels below the lower explosive limit (3%) will reduce the potential flammability of vapors above the liquid, however, this should not be done to the extent that all oxygen is rigorously excluded. Do not store for more than six months.

**Materials To Avoid:**

Strong oxidizers, acids, bases, alkalis, free radical initiators (e.g. azoisobutyronitrile, peroxides or epoxides), bromine, bromides, amines, ammonia, sodium hydroxide (caustic soda) solutions, silver nitrate, copper, copper alloys.

**Hazardous Decomposition Products:**

Carbon monoxide (CO)  
Carbon dioxide  
oxides of nitrogen  
hydrogen cyanide (HCN)

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## 11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the regulated components of this product is as follows:

Acrylonitrile toxicology studies sponsored by Cytec Industries show: Acrylonitrile has acute oral (mouse/rat) LD50 values ranging from 36-81 mg/kg. The dermal (rat) LD50 is <200 mg/kg. The 1-hour (rat) LC50 for Acrylonitrile is >1000 ppm (2.17 mg/L). The 4-hour (rat) LC50 is calculated to be >500 ppm (1.08 mg/L). Acrylonitrile caused allergic skin reactions when tested in guinea pigs. Eye and skin irritation studies with rabbits show this material can cause moderate to severe irritation. Acrylonitrile was negative in the Ames assay, both with and without metabolic activation. A concentration of 0.1 ul/ml caused a significant increase in the morphologic transformation of BALB/3T3 cells in the presence of an exogenous mammalian activation. Acrylonitrile (75 ug/ml) induced an increased frequency of mutations at the hypoxanthine-guanine phosphoribosyl transferase (hgprt) locus in Chinese Hamster Ovary (CHO) cells. A concentration of 0.1-5.0 mg/ml significantly increased unscheduled DNA synthesis in rat primary hepatocytes. Toxicology studies sponsored by government agencies and/or other acrylonitrile producers have shown acrylonitrile to cause cancer in laboratory animals. Chronic studies in rats administered acrylonitrile in drinking water at doses of 1.4 mg/kg/day and higher have shown development of tumors at multiple sites. Oral administration of 25 mg/kg/day of acrylonitrile to pregnant rats during days 6 to 15 of gestation resulted in increased incidences of fetal malformations. Inhalation exposure to 80 ppm of acrylonitrile to pregnant rats during days 6 to 15 of gestation also resulted in increased numbers of fetal malformations. In a three generation reproduction study in rats, administration of 70 mg/kg/day of acrylonitrile in drinking water resulted in reduced viability and lactation indices in all generations. In mice, adverse effects on male reproductive organs (testicular tubules) were observed after exposure to 10 mg/kg/day in a 60 day study, however, these effects were not observed in rats exposed to 14 mg/kg/day of acrylonitrile for 2 years. Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited. Dermal contact may produce moderate irritation or delayed blistering. Repeated or prolonged dermal contact with this material may cause allergic skin reactions. Direct eye contact may cause moderate to severe irritation. Based on animal evidence, chronic exposure to acrylonitrile may cause cancer. However, the carcinogenicity of acrylonitrile has been investigated in humans. A Cytec sponsored epidemiological study involving 2671 workers, 1774 of whom were exposed to acrylonitrile, did not show any significant increase in cancer mortality due to acrylonitrile exposure.

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## 12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.



## Hazardous Substances:

<u>Component / CAS No.</u>	<u>Reportable Quantity of Product (lbs)</u>
Acrylonitrile	100.3009

Comments: Hazardous Substances/Reportable Quantities - DOT requirements specific to Hazardous Substances only apply if the quantity in one package equals or exceeds the product reportable quantity.

**TRANSPORT CANADA**

Proper Shipping Name: Acrylonitrile, stabilized  
Hazard Class: 3  
Subsidiary Class: 6.1  
Packing Group: I  
UN Number: UN1093  
Transport Label Required: Flammable Liquid  
Toxic

**ICAO / IATA**

Proper Shipping Name: Acrylonitrile, stabilized  
Hazard Class: 3  
Subsidiary Class: 6.1  
Packing Group: I  
UN Number: UN1093  
Transport Label Required: Flammable Liquid  
Toxic  
Packing Instructions/Maximum Net Quantity Per Package:  
Passenger Aircraft: ---; Forbidden  
Cargo Aircraft: 303; 30L

**IMO**

Proper Shipping Name: Acrylonitrile, stabilized  
Hazard Class: 3  
Subsidiary Class: 6.1  
UN Number: UN1093  
Packing Group: I  
Transport Label Required: Flammable Liquid  
Toxic

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**15. REGULATORY INFORMATION**

This product has been classified in accordance with the hazard criteria of the Controlled products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

**WHMIS CLASSIFICATION:**

Class B2 Flammable Liquid  
Class D1A Very Toxic  
Class D2A Very Toxic  
Class D2B Toxic  
Class F Dangerous Reactive

**INVENTORY INFORMATION**

**United States (USA):** All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

**Canada:** All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

**European Union (EU):** All components of this product are included on the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed on EINECS.



**Australia:** All components of this product are included in the Australian Inventory of Chemical Substances (AICS).

**China:** All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

**Japan:** All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.

**Korea:** All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

**Philippines:** All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

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## 16. OTHER INFORMATION

### NFPA Hazard Rating (National Fire Protection Association)

Health: 4 - Materials that, under emergency conditions, can be lethal.

Fire: 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions.

Reactivity: 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.

**Reasons For Issue:** Revised Section 15

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06/10/2008

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