Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

ACETONE CYANOHYDRIN (ACH)

Supplier

ROHM AND HAAS CHEMICALS LLC
A Subsidiary of The Dow Chemical Company
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399 United States

For non-emergency information contact: 215-592-3000

For non-emergency information contact: 215-592-3000

Emergency telephone number

1 800 424 9300

Local Emergency telephone number

989-636-4400

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
ACETONE CYANOHYDRIN (ACH)	75-86-5	>= 98.5%
Hydrogen Cyanide	74-90-8	<= 0.05%
Acrylonitrile	107-13-1	<= 0.001%

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form	liquid
Colour	Yellow to brown
Colour	clear
Odour	bitter almond 0.8 ppm threshold

Hazard Summary	**DANGER!** MAY BE FATAL IF INHALED. EYE CONTACT MAY BE FATAL. MAY BE FATAL IF ABSORBED THROUGH SKIN. MAY BE FATAL IF SWALLOWED. INHALATION OF VAPOR OR MIST CAN CAUSE THE FOLLOWING: IRRITATION OF NOSE AND THROAT HEADACHE NAUSEA WEAKNESS VOMITING GIDDINESS DIZZINESS LABORED BREATHING CONVULSIONS REDUCED SENSITIVITY OF THE SENSES OF TASTE AND SMELL UNCONSCIOUSNESS THE EFFECTS OF EYE/SKIN CONTACT WILL BE SIMILAR TO THOSE OF INHALATION. PROLONGED OR REPEATED EXPOSURE CAN CAUSE THE FOLLOWING: KIDNEY DAMAGE LIVER DAMAGE CENTRAL NERVOUS SYSTEM (CNS) EFFECTS

Potential Health Effects

Primary Routes of Entry:
Inhalation
Eye contact
Skin contact
Dermal Absorption

Eyes: Material can cause the following:
effects similar to inhalation
possible death

Skin: The effects of skin contact will be similar to those of inhalation.
This material as a vapor or liquid can be absorbed through intact skin in fatal amounts.

Ingestion: May be fatal if swallowed.
Material can cause the following:
headache
nausea
sore throat
slow respiration
unconsciousness
Death

Inhalation: Inhalation of vapor or mist can cause the following:
irritation of nose and throat
headache
nausea
weakness
giddiness
labored breathing

dizziness
Convulsions
Vomiting
reduced sensitivity of the senses of taste and smell
unconsciousness
Death

Chronic Exposure: Material can cause the following:
kidney damage
liver damage
central nervous system (CNS) effects

Hydrogen Cyanide	IRIS	D: Not classifiable as to human carcinogenicity [1986 Guidelines]
Acrylonitrile	ACGIH	Confirmed animal carcinogen with unknown relevance to humans.
Acrylonitrile	US CA CRT	Carcinogenic.
Acrylonitrile	NTP CARC	Anticipated carcinogen.
Acrylonitrile	OSHA	Cancer hazard.
Acrylonitrile	IARC	Possibly carcinogenic to humans.
Acrylonitrile	IRIS	Probable human carcinogen - limited human evidence.
Acrylonitrile	US CA OEL	Cancer hazard.
Acrylonitrile	US CA OEL	Simple asphyxiant.
Acrylonitrile	NIOSH	Potentially carcinogenic.
Acrylonitrile	IRIS	B1: Probable human carcinogen - based on limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in animals [1986 Guidelines]

4. FIRST AID MEASURES

Inhalation: ACETONE CYANOHYDRIN (ACH) should be treated as though it were hydrogen cyanide. Move to fresh air. Give artificial respiration if breathing has stopped. DO NOT use mouth-to-mouth resusitation as a form of artificial respiration. A pearl (ampule) of amyl nitrite should be broken and wrapped lightly in a handkerchief and held one inch from the mouth and nostrils for 15-30 seconds. Repeat 5 times at 15 second intervals. Continue with amyl nitrite treatment while seeking IMMEDIATE medical attention. Use a fresh pearl every 5 minutes until 3 or 4 pearls have been administered.

Skin contact: IMMEDIATELY get under a safety shower. Remove contaminated clothing. Wash affected skin areas thoroughly with soap and water. Get prompt medical attention. Wash contaminated clothing before reuse. Discard contaminated shoes, belts, and other articles made of leather.

Eye contact: IMMEDIATELY flush eyes with a large amount of water for at least 15 minutes. Get prompt medical attention.

Ingestion: Induce vomiting by giving 2 glasses of water to drink and touching back of subject's throat with finger. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person. If patient is unconscious, treat as inhalation exposure.

Notes to physician: Treat this material as a highly toxic substance. If swallowed, careful evacuation of the stomach is advisable. If patient is unconscious, continue administration of amyl nitrite by inhalation every minute until sodium nitrite and sodium thiosulfate is prepared. Infuse I.V. of 10-15 ml of 3% sodium nitrite over 2-4 minutes followed by 50 ml of 25% sodium thiosulfate. Repeat injection at hourly intervals if necessary.

5. FIRE-FIGHTING MEASURES

Flash point	74 °C (165.20 °F) Tag closed cup
Ignition temperature	688.0 °C (1,270.40 °F)
Lower explosion limit	2.20 %(V)
Upper explosion limit	40.00 %(V)

Suitable extinguishing media: Use the following extinguishing media when fighting fires involving this material:
Carbon dioxide (CO2)
Water spray
Dry chemical
polar solvent (alcohol) foam

Specific hazards during fire fighting: Vapors can travel to a source of ignition and flash back. Heat can cause polymerization. Heated containers can explode. Combustion generates toxic fumes of the following: acetone-like cyanides Material can release vapors at or above room temperature that will form flammable or explosive mixtures with air.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus and protective suit.

Further information: EXPLOSION HAZARD. Fight advanced fires from a protected location.
Cool closed containers exposed to fire with water spray.
DO NOT permit water to enter containers.
Evacuate the spill area immediately.
Remain upwind.
Avoid breathing smoke.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
This material is highly toxic. See SECTION 8, Exposure Controls/Personal Protection, prior to handling.
Wear a NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode or a full-facepiece airline respirator in the pressure demand mode with emergency escape provisions.
Wear full protective equipment including: acid-resistant clothing, gloves and boots, chemical splash goggles and face shield (ANSI Z-87.1 or approved equivalent).
Wear a gas/vapor tight suit if hydrogen cyanide levels exceed 50 ppm.
Protective clothing made of the following material should be worn to avoid skin contact:
Neoprene

If exposed to material during clean-up operations, IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. See SECTION 4, First Aid Measures, for further information.

Methods for cleaning up

Eliminate all ignition sources.
Evacuate the spill area immediately.
Avoid all contact.
For small spills, wet down area lightly with water and then cover contaminated area with calcium hypochlorite (about one-eighth of an inch thick). Spray lightly with water. Allow to stand for at least 1 hour - if cyanide odor (bitter almond) still persists, repeat. For large spills which cannot be collected, dilute with at least 50 volumes of water. Add caustic to raise pH above 9.5. Treat with calcium hypochlorite.
Transfer spilled material to suitable containers for recovery or disposal.
See SECTION 13, Disposal Considerations, for information regarding the disposal of contained spills.
WARNING: KEEP SPILLS AND CLEANING RUNOFFS OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER.

7. HANDLING AND STORAGE

Handling

Before handling, personnel should be thoroughly familiar with handling and decontamination procedures. This material is highly toxic. See SECTION 8, Exposure Controls/Personal Protection, prior to handling. Ground all containers when transferring material. Use non-sparking tools and grounding cables when transferring. Avoid contact with clothing and other combustible materials. Wash after handling and shower at end of work period. A pH above 2.0 may promote decomposition. See HAZARDOUS DECOMPOSITION PRODUCTS Section prior to handling.

Advice on protection against fire and explosion: CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied. Residual vapors in empty containers may explode on ignition. DO NOT cut, drill, grind or weld on or near container.

Storage

Storage conditions: Store in an area isolated from other materials to prevent contamination. Avoid all ignition sources. Keep in a well-ventilated place. Material can burn; limit indoor storage to approved areas equipped with automatic sprinklers. Ground all metal containers during storage and handling. Store away from excessive heat (e.g. steampipes, radiators), from sources of ignition and from reactive materials. Do not store near combustible materials. Store out of direct sunlight in a cool place. Keep container tightly closed when not in use. Containers should not be in storage for more than 6 months. Store material in a secure area to protect from physical damage. May be stored in appropriate refrigerator.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value
ACETONE CYANOHYDRIN (ACH)	Rohm and Haas	Ceiling	1 ppm
	Rohm and Haas	Absorbed via skin	
	ACGIH	Ceiling	5 mg/m3

	ACGIH	SKIN_DES	
	WEEL	TWA	7.1 mg/m3 2 ppm
	WEEL	STEL	17.7 mg/m3 5 ppm
	WEEL	SKIN_DES	

Component	Regulation	Type of listing	Value
Hydrogen Cyanide	Rohm and Haas	TWA	1.9 ppm
	Rohm and Haas	TLV-C	4.7 ppm
	Rohm and Haas	Absorbed via skin	
	ACGIH	Ceiling	4.7 ppm
	ACGIH	SKIN_DES	
	NIOSH/GUIDE	STEL	5 mg/m3 4.7 ppm
	NIOSH/GUIDE	SKIN_DES	
	OSHA_TRANS	PEL	11 mg/m3 10 ppm
	OSHA_TRANS	SKIN_DES	
	Z1A	STEL	5 mg/m3 4.7 ppm
	Z1A	SKIN_FINAL	

Component	Regulation	Type of listing	Value
Acrylonitrile	Rohm and Haas	TWA	1 ppm
	Rohm and Haas	STEL	3 ppm
	Rohm and Haas	Absorbed via skin	
	ACGIH	TWA	2 ppm
	ACGIH	SKIN_DES	
	NIOSH/GUIDE	REL	1 ppm
	NIOSH/GUIDE	Ceil_Time	10 ppm
	NIOSH/GUIDE	SKIN_DES	
	OSHASP	REF	
	OSHASP	TWA	2 ppm
	OSHASP	STEL	10 ppm
	OSHASP	OSHA_ACT	1 ppm
	OSHASP	SKIN_DES	
	Z1A	TWA	2 ppm
	Z1A	Ceiling	10 ppm

Exposure controls

Engineering measures: Use explosion-proof local exhaust ventilation with a minimum capture velocity of 150 ft/min (0.75 m/sec) at the point of dust or mist evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Individual protection measures

Eye/face protection: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed. NOTE: Eye contact may be fatal.

Skin protection

Hand protection: Chemical-resistant gloves should be worn whenever this material is handled. The glove(s) listed below may provide protection against permeation. (Gloves

of other chemically resistant materials may not provide adequate protection): Neoprene gloves Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Rinse and remove gloves immediately after use. Wash hands with soap and water. Avoid skin contact. When using this substance, use skin protection. NOTE: Material may be absorbed through the skin in lethal amounts.

Other protection: Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required.

Respiratory protection: A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements or equivalent must be followed whenever workplace conditions warrant a respirator's use. None required if airborne concentrations are maintained below the exposure limit listed in Exposure Limit Information. Above the exposure limit: Wear a properly fitted NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode, OR full-facepiece, airline respirator in the pressure demand mode with emergency escape provision.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	Yellow to brown
	clear
Odour	bitter almond 0.8 ppm threshold
pH	1.8 - 2.2 50% Solution
Melting point/range	-19.00 °C (-2.20 °F)
Boiling point/boiling range	82 °C (179.60 °F) 23 mm Hg
Flash point	74 °C (165.20 °F) Tag closed cup
Evaporation rate	<1.00
Lower explosion limit	2.20 %(V)
Upper explosion limit	40.00 %(V)
Vapour pressure	0.8 mmHg at 20 °C (68.00 °F)
Relative vapour density	2.9
Relative density	0.92 - 0.93 at 15.00 °C (59.00 °F)
Water solubility	completely soluble
Autoignition temperature	688 °C (1,270.40 °F)
Viscosity, dynamic	20.000 mPa.s Slightly Viscous
Percent volatility	100 %

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions However, this material can undergo hazardous polymerization. See Hazardous Polymerization for conditions to avoid.
This material is considered stable under specified conditions of storage, shipment and/or use. See SECTION 7, Handling And Storage, for specified conditions.

Materials to avoid Avoid contact with the following: Water Acids Bases Amines acetaldehyde

Hazardous decomposition products Thermal decomposition may yield the following:, Acetone, Hydrogen cyanide (hydrocyanic acid),

Polymerisation Excessive heat and ignition sources may cause polymerization.
Polymerization may occur if contaminated with the following:
- water (moisture)
Bases

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity LD50 rat 17 mg/kg

LD50 mouse 14 mg/kg

Acute inhalation toxicity LC Lo rat 4 h 63 ppm

Acute dermal toxicity LD50 rat 17 mg/kg

12. ECOLOGICAL INFORMATION

Material is extremely toxic to aquatic life.

Hydrogen Cyanide

Elimination information (persistence and degradability)

Bioaccumulation Oncorhynchus mykiss (rainbow trout) Calculated
Bioconcentration factor (BCF): 6.3

Ecotoxicity effects

Toxicity to fish LC50 Pimephales promelas (fathead minnow) 96 h Method Not Specified
0.082 - 0.137 mg/l

Toxicity to aquatic invertebrates EC50 Daphnia magna (Water flea) 48 h Method Not Specified
1.8 mg/l

Acrylonitrile

Elimination information (persistence and degradability)

Bioaccumulation	Fish Bioconcentration factor (BCF): 3.48
Ecotoxicity effects	
Toxicity to fish	LC50 Pimephales promelas (fathead minnow) 96 h OECD Test Guideline 203 or Equivalent 14 - 18 mg/l
Toxicity to aquatic invertebrates	EC50 Daphnia magna (Water flea) 48 h OECD Test Guideline 202 or Equivalent 8.7 - 10 mg/l

13. DISPOSAL CONSIDERATIONS

Disposal

Waste Classification: 40 CFR 261.20 - .24 - Characteristic Waste D002
Waste Classification: 40 CFR 261.30 - .38 - Listed Waste - P069
Dilute waste product with at least 50 volumes of water. Decontaminate with alkaline hypochlorite solution. For disposal,incinerate the contaminated liquid and solid diking material at a facility that complies with local, state, and federal regulations. (See 40 CFR 268)

14. TRANSPORT INFORMATION

DOT

Proper shipping name	ACETONE CYANOHYDRIN (ACH), stabilized, Poison Inhalation Hazard Zone B
UN number	UN 1541
Class	6.1
Packing group	I
Marine pollutant	2-hydroxy-2-methylpropionitrile; 2-cyanopropan-2-ol; ACETONE CYANOHYDRIN (ACH)
Reportable Quantity	2-hydroxy-2-methylpropionitrile; 2-cyanopropan-2-ol; ACETONE CYANOHYDRIN (ACH)

IMO/IMDG

Proper shipping name	ACETONE CYANOHYDRIN (ACH), stabilized, Poison Inhalation Hazard Zone B
UN number	UN 1541
Class	6.1
Packing group	I
Marine pollutant	2-hydroxy-2-methylpropionitrile; 2-cyanopropan-2-ol; ACETONE CYANOHYDRIN (ACH)
Reportable Quantity	2-hydroxy-2-methylpropionitrile; 2-cyanopropan-2-ol; ACETONE CYANOHYDRIN (ACH)

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification

OSHA: This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

WHMIS: This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Acute Health Hazard
Chronic Health Hazard
Fire Hazard
Reactivity Hazard

SARA TITLE III: Section 313 Information (40CFR372)

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

CERCLA Information (40CFR302.4)

This material is regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)and the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304. This material is or contains chemical(s) listed in 40 CFR Table 302.4 or nondesignated RCRA ICR substance(s). (Nondesignated ICR substances apply to materials that will not be reused.) The Reportable Quantity(s) (RQ) are listed below. Releases in excess of its reportable quantity must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.

ACETONE CYANOHYDRIN (ACH)	75-86-5	10 lbs RQ

US. Toxic Substances Control Act (TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)

This product contains a component or components known to the state of California to cause cancer:

Components:	Acrylonitrile	107-13-1

16. OTHER INFORMATION

Hazard Rating

	Health	Fire	Reactivity
HMIS	4*	2	2

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAc	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):

TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
|	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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