

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<p>Corrosive to eyes and skin on contact. Toxic compound, do not ingest or inhale. Avoid all contact with this material. Combustible material; avoid heat and sources of ignition. Lachrymator. CARCINOGEN. MINIMIZE EXPOSURE. MUTAGEN. MINIMIZE EXPOSURE.</p>	

Section I. Chemical Product and Company Identification

Chemical Name	Acetic Anhydride (ca. 1mol/l Dichloromethane)		
Catalog Number	A1668	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	Not available.		
Chemical Formula	C ₄ H ₆ O ₃		
CAS Number	108-24-7 (Acetic Anhydride) 75-09-2 (Dichloromethane)	In case of Emergency Call	Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Acetic Anhydride (ca. 1mol/l Dichloromethane)	108-24-7 (Acetic Anhydride) 75-09-2 Dichloromethane	ca. 7.7% ca.92.3%	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.	(Acetic Anhydride) Rat LD ₅₀ (oral) 1780 mg/kg Rat LC ₅₀ (inhalation) 4200 mg/m ³ Rabbit LD ₅₀ (dermal) 4 ml/kg (Dichloromethane) Rat LD ₅₀ (oral) 1600 mg/kg Rat LC ₅₀ (inhalation) 5000 mg/m ³ Mouse LD ₅₀ (oral) 873 mg/kg Mouse LC ₅₀ (inhalation) 14400 ppm

Section III. Hazards Identification

Acute Health Effects	<p>Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects. Rat TCLo Inhalation 3500 ppm/6 hours/2 years intermittent TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Mouse TCLo Inhalation 122400 mg/kg/102 weeks intermittent TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Lung, thorax, or Respiration - Tumors Liver - Tumors Mouse TCLo Inhalation 2000 ppm/5 hours/2 years continuous TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Lung, thorax, or Respiration - Tumors DEVELOPMENTAL TOXICITY: Reproductive Effects. Rat TCLo Inhalation 1250 ppm/7 hours, female 6-15 days of pregnancy. TOXIC Effects: Specific Developmental Abnormalities - Musculoskeletal system Specific Developmental Abnormalities - Urogenital system Mouse TCLo Inhalation 1250 ppm/7 hours, female 6-15 days of pregnancy TOXIC Effects: Specific Developmental Abnormalities - Musculoskeletal system Rat TCLo Inhalation 4500 ppm/24 hours, female 1-17 days of pregnancy TOXIC Effects: Effects on Newborn - Behavioral</p>

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	Combustible.	Auto-Ignition	332°C (629.6°F) (Acetic Anhydride) 662°C (61223.6°F) (Dichloromethane)
Flash Points	49°C (120.2°F). (Acetic Anhydride) 100°C (212°F). (Dichloromethane)	Flammable Limits	LOWER: 2.7% UPPER: 10.3% (Acetic Anhydride) LOWER: 12% UPPER: 19% (Dichloromethane)
Combustion Products	These products are toxic carbon oxides (CO, CO ₂), halogenated compounds WARNING: Highly toxic HCl gas is produced during combustion.		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	Combustible liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Corrosive material. Toxic material. Combustible material. Lachrymatory material. Carcinogenic material. Mutagenic material. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.
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Section VII. Handling and Storage

Handling and Storage Information	CORROSIVE. TOXIC. COMBUSTIBLE. LACHRYMATORY. CARCINOGENIC. MUTAGENIC. Keep locked up. Keep container dry. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. DO NOT ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, reducing agents, metals, acids, alkalis (bases), moisture.
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Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Face shield. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Liquid. (Clear.)	Solubility	(Acetic Anhydride) Slowly soluble in water, forming acetic acid; with alcohol forms ethyl acetate. Soluble in chloroform, ether. (Dichloromethane) Soluble in ~ 50 parts water. Miscible with alcohol, ether, dmf.
Specific Gravity	1.08 (water=1) (Acetic Anhydride) 1.33 (water=1) (Dichloromethane)	Partition Coefficient	Log K _{ow} : 1.25 (Dichloromethane)
Molecular Weight	C ₄ H ₆ O ₃ =102.09 (Acetic Anhydride) CH ₂ Cl ₂ =84.93 (Dichloromethane)	Vapor Pressure	4 mmHg (@ 20°C) (Acetic Anhydride) 353.11 mmHg (@ 20°C) (Dichloromethane)
Boiling Point	139°C (282.2°F) (Acetic Anhydride) 40°C (104°F) (Dichloromethane)		

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Emergency phone number (800) 424-9300

Melting Point	-73°C (-99.4°F) (Acetic Anhydride) -97°C (-142.6°F) (Dichloromethane)	Vapor Density	3.5 (Air = 1) (Acetic Anhydride) 2.9 (Air = 1) (Dichloromethane)
Refractive Index	1.39 (Acetic Anhydride) 1.424 (Dichloromethane)	Volatility	Not available.
Critical Temperature	Decomp Temp: 136°C (Acetic Anhydride)	Odor	Not available.
Viscosity	0.91 Pas (Acetic Anhydride) <0.001 Pas @ 20°C (Dichloromethane)	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. Moisture sensitive.
Incompatibilities	Reactive with oxidizing agents, reducing agents, metals, acids, alkalis (bases), moisture.

Section XI. Toxicological Information

RTECS Number	AK1925000 (Acetic Anhydride) PA8050000 (Dichloromethane)
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	(Acetic Anhydride) Rat LD ₅₀ (oral) 1780 mg/kg Rat LC ₅₀ (inhalation) 4200 mg/m ³ Rabbit LD ₅₀ (dermal) 4 ml/kg (Dichloromethane) Rat LD ₅₀ (oral) 1600 mg/kg Rat LC ₅₀ (inhalation) 5000 mg/m ³ Mouse LD ₅₀ (oral) 873 mg/kg Mouse LC ₅₀ (inhalation) 14400 ppm
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects. Rat TCLO Inhalation 3500 ppm/6 hours/2 years intermittent TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Mouse TCLO Inhalation 122400 mg/kg/102 weeks intermittent TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Lung, thorax, or Respiration - Tumors Liver - Tumors Mouse TCLO Inhalation 2000 ppm/5 hours/2 years continuous TOXIC Effects: Tumorigenic - Carcinogenic by RTECS criteria Lung, thorax, or Respiration - Tumors DEVELOPMENTAL TOXICITY: Reproductive Effects. Rat TCLO Inhalation 1250 ppm/7 hours, female 6-15 days of pregnancy. TOXIC Effects: Specific Developmental Abnormalities - Musculoskeletal system Specific Developmental Abnormalities - Urogenital system Mouse TCLO Inhalation 1250 ppm/7 hours, female 6-15 days of pregnancy TOXIC Effects: Specific Developmental Abnormalities - Musculoskeletal system Rat TCLO Inhalation 4500 ppm/24 hours, female 1-17 days of pregnancy TOXIC Effects: Effects on Newborn - Behavioral
Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	(Acetic Anhydride) Acetic anhydride's production and use in the preparation of cellulose acetate fibers and plastics, and as a dehydrating and acetylating agent may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 5.1 mm Hg at 25 deg C indicates acetic anhydride will exist solely as a vapor in the ambient atmosphere. Vapor-phase acetic anhydride will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 190 days. Acetic anhydride does not absorb light with wavelengths >290 nm and is not expected to be susceptible to direct photolysis by sunlight. If released to soil, the major fate of acetic anhydride is expected to be hydrolysis. Acetic anhydride may volatilize from dry soil surfaces based upon its vapor pressure. If released into water, acetic anhydride will rapidly hydrolyze; the half-life of acetic anhydride in water is 4.4 minutes at 25 deg C. Bioconcentration of acetic anhydride in aquatic organisms is unlikely due its rapid hydrolysis. Occupational exposure to acetic anhydride may occur through inhalation and dermal contact with this compound at

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workplaces where acetic anhydride is produced or used. No monitoring data were found for acetic anhydride. Due to acetic anhydride's rapid hydrolysis, it is unlikely that the general population would be exposed to this chemical; however, acetic anhydride may exist as a vapor in dry air.

(Dichloromethane)

Dichloromethane's production and use as solvent, chemical intermediate, grain fumigant, paint stripper and remover, metal degreaser, and refrigerant may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 435 mm Hg at 25 deg C indicates dichloromethane will exist solely as a vapor in the ambient atmosphere. Vapor-phase dichloromethane will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 119 days. It will not be subject to direct photolysis. If released to soil, dichloromethane is expected to have very high mobility based upon an estimated K_{oc} of 24. Volatilization from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 3.25X10⁻³ atm-cu m/mole. Dichloromethane may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation in soil may occur based on activated sludge studies. If released into water, dichloromethane is not expected to adsorb to suspended solids and sediment in water based upon the estimated K_{oc}. Biodegradation is possible in natural waters but will probably be very slow compared with evaporation. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 1 hr and 4 days, respectively. An estimated BCF of 2 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not an important degradation process under normal environmental conditions. Occupational exposure to dichloromethane may occur through inhalation and dermal contact with this compound at workplaces where dichloromethane is produced or used. The general population may be exposed to dichloromethane via inhalation of ambient air, ingestion of food and drinking water, and dermal contact with consumer products, such as paint strippers, which contain dichloromethane.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
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Section XIV. Transport Information

DOT Classification	DOT Class 8: Corrosive material DOT Class 6.1: Toxic material
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PIN Number	UN2922
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Proper Shipping Name	Corrosive liquid, toxic, n.o.s.
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Packing Group (PG)	III
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DOT Pictograms	 
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Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is ON the EPA Toxic Substances Control Act (TSCA) inventory list.
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WHMIS Classification (Canada)	CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC). CLASS E: Corrosive liquid. On DSL.
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EINECS Number (EEC)	203-564-8 (Acetic Anhydride) 200-838-9 (Dichloromethane)
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EEC Risk Statements	R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R34- Causes burns. R45- May cause cancer. R46- May cause heritable genetic damage. R47- May cause birth defects.
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Japanese Regulatory Data	ENCS No. 2-690 (Acetic Anhydride) ENCS No. 2-36 (Dichloromethane)
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Section XVI. Other Information

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Validated on 7/31/2007.
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Notice to Reader

TCl laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.