





Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	<p>Highly toxic compound, do not ingest or inhale. Avoid all contact with this material. (OSHA Inhalation Hazard)</p> <p>Combustible material; avoid heat and sources of ignition.</p> <p>Corrosive to eyes and skin on contact.</p> <p>POSSIBLE CARCINOGEN. MINIMIZE EXPOSURE.</p> <p>Lachrymator.</p> <p>Light and moisture sensitive.</p>	

Section I. Chemical Product and Company Identification

Chemical Name	trans-1,4-Dichloro-2-butene		
Catalog Number	D1624	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	2-Butylene Dichloride		
Chemical Formula	CICH ₂ CH:CHCH ₂ Cl		
CAS Number	110-57-6	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
trans-1,4-Dichloro-2-butene	110-57-6	Min. 95.0 (GC)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LC ₅₀ (inhalation) 86ppm/4H

Section III. Hazards Identification

Acute Health Effects	<p>Highly toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.</p> <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.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Not available.</p> <p>MUTAGENIC EFFECTS : Not available.</p> <p>TERATOGENIC EFFECTS : TUMORIGENIC EFFECTS:</p> <p>Mouse TDLo (intraperitoneal) 150mg/kg/77 Weeks, intermittent.</p> <p>Toxic Effects:</p> <p>Tumorigenic- Equivocal tumorigenic agent by RTECS criteria.</p> <p>Tumorigenic- Tumors at site of application.</p> <p>Mouse TDLo (subcutaneous) 150mg/kg/77 Weeks, intermittent.</p> <p>Tumorigenic- Neoplastic by RTECS criteria.</p> <p>Tumorigenic- Tumors at site of application.</p> <p>DEVELOPMENTAL TOXICITY: Not available.</p> <p>Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</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	DO NOT INDUCE VOMITING. 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	Not available.
Flash Points	53°C (127.4°F).	Flammable Limits	Not available.
Combustion Products	These products include 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	Highly toxic material. Combustible material. Corrosive material. Possible carcinogenic material. Lachrymatory material. Light and moisture sensitive. 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.

Section VII. Handling and Storage	
Handling and Storage Information	HIGHLY TOXIC. COMBUSTIBLE. CORROSIVE. POSSIBLE CARCINOGEN. LACHRYMATOR. LIGHT AND MOISTURE SENSITIVE. 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.

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 possible carcinogen. There is no acceptable exposure limit for a carcinogen.



Section IX. Physical and Chemical Properties			
Physical state @ 20°C	Liquid. (Colorless.)	Solubility	Soluble in alcohol, ether, acetone, benzene. Soluble in chloroform, organic solvents.
Specific Gravity	1.183 (water=1) @ 25°C		
Molecular Weight	125.00	Partition Coefficient	Not available.
Boiling Point	74 to 76 °C (165.2 to 168.8 °F) @ 40mmHg	Vapor Pressure	1.3 kPa (@ 20°C)
Melting Point	2°C (35.6°F)	Vapor Density	Not available.
Refractive Index	1.4871	Volatility	Not available.
Critical Temperature	Not available.	Odor	Distinct.
Viscosity	Not available.	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	May decompose on exposure to light, moist air or water. Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents.

Section XI. Toxicological Information	
RTECS Number	EM4903000
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LC ₅₀ (inhalation) 86ppm/4H
Chronic Toxic Effects	<p>CARCINOGENIC EFFECTS : Not available.</p> <p>MUTAGENIC EFFECTS : Not available.</p> <p>TERATOGENIC EFFECTS : TUMORIGENIC EFFECTS:</p> <p>Mouse TDLo (intraperitoneal) 150mg/kg/77 Weeks, intermittent.</p> <p>Toxic Effects:</p> <p>Tumorigenic- Equivocal tumorigenic agent by RTECS criteria.</p> <p>Tumorigenic- Tumors at site of application.</p> <p>Mouse TDLo (subcutaneous) 150mg/kg/77 Weeks, intermittent.</p> <p>Tumorigenic- Neoplastic by RTECS criteria.</p> <p>Tumorigenic- Tumors at site of application.</p> <p>DEVELOPMENTAL TOXICITY: Not available.</p> <p>Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>
Acute Toxic Effects	<p>Highly toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.</p> <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.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>

Section XII. Ecological Information	
Ecotoxicity	Not available.
Environmental Fate	<p>1,4-Dichloro-trans-2-butene's production and use as a starting material in the manufacture of adiponitrile, butane-1,4-diol and tetrahydrofuran may result in its release to the environment through various waste streams. It also occurs as an intermediate in the production of chloroprene. If released to air, a vapor pressure of 3.43 mm Hg at 25 deg C indicates 1,4-dichloro-trans-2-butene will exist solely as a vapor in the ambient atmosphere. Vapor-phase 1,4-dichloro-trans-2-butene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals and ozone molecules. The half-life for the reaction in air with hydroxyl radicals is estimated to be 10 hours and the reaction with ozone molecules is about 8 days. If released to soil, 1,4-dichloro-trans-2-butene is expected to have moderate mobility based upon a measured Koc of 215. Volatilization from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 6.6X10⁻⁴ atm-cu m/mole. 1,4-Dichloro-trans-2-butene may volatilize from dry soil surfaces based upon its vapor pressure. The hydrolysis half-life of 1,4-dichloro-trans-2-butene was measured as 3.2 days under neutral conditions, suggesting hydrolysis may be an important fate process in moist soils and water. Limited soil data suggest that biodegradation will not be an important fate process since volatilization and hydrolysis are expected to occur rapidly. If released into water, 1,4-dichloro-trans-2-butene is not expected to adsorb to suspended solids and sediment based upon the Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 2 hours and 5 days, respectively. An estimated BCF of 14 suggests the potential for bioconcentration in aquatic organisms is low. Occupational exposure to 1,4-dichloro-trans-2-butene may occur through inhalation and dermal contact with this compound at workplaces where 1,4-dichloro-trans-2-butene is produced or used. (HSDB)</p>

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.

Section XIV. Transport Information	
DOT Classification	CLASS 6.1: Toxic material. CLASS 3: Flammable liquid.
PIN Number	UN2929
Proper Shipping Name	Toxic liquid, flammable, organic, n.o.s.
Packing Group (PG)	II
DOT Pictograms	 

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is ON the EPA Toxic Substances Control Act (TSCA) inventory list. This product is subject to SARA Section 313 reporting requirements.
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-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.
EINECS Number (EEC)	203-779-7
EEC Risk Statements	R24/25- Toxic in contact with skin and if swallowed. R26- Very toxic by inhalation. R34- Causes burns. R45- May cause cancer.
Japanese Regulatory Data	Not available.

Section XVI. Other Information**Version 1.0****Validated on 6/26/2007.****Printed 6/26/2007.****Notice to Reader**

TCI 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.

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