







Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
 	Flammable material; avoid heat and sources of ignition. Irritating to skin, eyes, and the respiratory system. Polymerization may occur. Protect from heat and light. Avoid long storage periods. Refrigerate. May develop pressure.	   

Section I. Chemical Product and Company Identification

Chemical Name	1,3-Pentadiene (cis- and trans- mixture)		
Catalog Number	P1841	Supplier	TCI America 9211 N. Harborsgate St. Portland OR 1-800-423-8616
Synonym	1,3-Pentadiene (CA INDEX NAME); Piperylene		
Chemical Formula	C ₅ H ₈		
CAS Number	504-60-9	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
1,3-Pentadiene (cis- and trans- mixture)	504-60-9	Min. 97.0 (GC)	Not available.	Rat LD ₅₀ (inhalation) 140 g/m ³ /2H

Section III. Hazards Identification

Acute Health Effects	Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY : Not available. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.

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. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
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	Flammable.	Auto-Ignition	Not available.
Flash Points	-29°C (-20.2°F).	Flammable Limits	LOWER: 1% UPPER: 7%
Combustion Products	These products are toxic carbon oxides (CO, CO ₂).		
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	Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Flammable material. Irritating material. Prone to polymerization. May develop pressure. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT touch spilled material. 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	FLAMMABLE. IRRITANT. PRONE TO POLYMERIZATION. REFRIGERATE. MAY DEVELOP PRESSURE. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray.
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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.
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Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent.
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Exposure Limits	Not available.
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Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid. (Clear, colorless ~ light yellow.)	Solubility	Soluble in methanol.
Specific Gravity	0.68(water=1)		
Molecular Weight	68.12	Partition Coefficient	Not available.
Boiling Point	42°C (107.6°F)	Vapor Pressure	54 kPa (@ 25°C)
Melting Point	Not available.	Vapor Density	2.35 (Air = 1)
Refractive Index	1.4290 - 1.4330	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
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	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents.

Section XI. Toxicological Information

RTECS Number	RZ2464000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD ₅₀ (inhalation) 140 g/m ³ /2H
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY : Not available. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.
Acute Toxic Effects	Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	1,3-Pentadiene's production and use as a co-monomer in the manufacture of polymers, maleic anhydride and as a chemical intermediate may result in its release to the environment through various waste streams. It may also be released to the environment during the combustion of biomass, from waste incinerators, and in the exhaust of motor vehicles. The commercial mixture of 1,3-pentadiene consists of 80% of the trans-isomer and 20% of the cis-isomer. If released to air a vapor pressure of 405 mm Hg at 25 deg C indicates 1,3-pentadiene will exist solely as a vapor in the ambient atmosphere. Vapor-phase 1,3-pentadiene 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 4 hours. The half-life for the reaction in air with ozone is estimated to be 5 hours. The vapor-phase reaction of 1,3-pentadiene with nitrate radicals may also be an important atmospheric removal process in urban areas at night, but the rate of this reaction is not known. If released to soil, 1,3-pentadiene is expected to have low mobility based upon an estimated Koc of 500. Volatilization from

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Emergency phone number (800) 424-9300

moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 0.069 atm-cu m/mole. 1,3-Pentadiene may volatilize from dry soil surfaces based upon its vapor pressure. If released into water, 1,3-pentadiene is expected to adsorb to suspended solids and sediment in water based upon the estimated K_{oc}. No biodegradation data were located for 1,3-pentadiene, but the biodegradation half-life of a similar compound, 1,3-butadiene, has been reported as 7 days in aerobic water and 28 days in anaerobic water. These data suggest that 1,3-pentadiene will also be biodegraded in aquatic systems. Volatilization from water surfaces is expected to be an important environmental fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 1 and 78 hours, respectively. An estimated BCF of 15 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. Occupational exposure may occur through inhalation and dermal contact with this compound at workplaces where 1,3-pentadiene is produced or used.

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 DOT Class 3: Flammable liquid

PIN Number UN3295

Proper Shipping Name Hydrocarbons, liquid, 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.

WHMIS Classification (Canada) CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
On DSL

EINECS Number (EEC) 207-995-2

EEC Risk Statements R10- Flammable.
R18- In use, may form flammable/explosive vapor-air mixture.
R36/37/38- Irritating to eyes, respiratory system and skin.

Japanese Regulatory Data ENCS No. 2-20

Section XVI. Other Information

Version 1.0
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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, 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.