

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
 	Highly flammable material; avoid heat and sources of ignition. Environmental hazard. This material is toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment. Harmful compound, minimize exposure. Irritating to skin, eyes, and the respiratory system. Refrigerate.	   

Section I. Chemical Product and Company Identification

Chemical Name	2-Methyl-2-butene		
Catalog Number	M0708	Supplier	TCI America 9211 N. Harborage St. Portland OR 1-800-423-8616
Synonym	Amylene; Pentene		
Chemical Formula	C ₅ H ₁₀		
CAS Number	513-35-9	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
2-Methyl-2-butene	513-35-9	Min. 90.0 (GC)	Not available.	Not available.

Section III. Hazards Identification

Acute Health Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. 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	240 °C (464 °F)
Flash Points	-45 °C (-49 °F).	Flammable Limits	LOWER: 1.6% UPPER: 7.7%
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.		

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Emergency phone number (800) 424-9300

Section VI. Accidental Release Measures**Spill Cleanup
Instructions**

Highly flammable material. Environmentally hazardous material. Harmful material. Irritating 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 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.

Section VII. Handling and Storage**Handling and Storage
Information**

HIGHLY FLAMMABLE. ENVIRONMENTAL HAZARD. HARMFUL. IRRITANT. REFRIGERATE. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray. Always store away from incompatible compounds such as oxidizing agents, acids.

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

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.

**Exposure Limits**

Not available.

Section IX. Physical and Chemical Properties**Physical state @ 20°C**

Liquid. (Clear. Colorless - almost colorless.)

Solubility

Soluble in benzene, ethanol, ethyl ether; Miscible with alcohol, ether; Insoluble in water (190 mg/L @ 22°C)

Specific Gravity

0.66 (water=1)

Molecular Weight

70.13

Partition Coefficient

LOG P_{ow}: 2.67

Boiling Point

38°C (100.4°F)

Vapor Pressure

62.3 kPa (@ 25°C)

Melting Point

-134°C (-209.2°F)

Vapor Density

2.4 (Air = 1)

Refractive Index

1.39

Volatility

Not available.

Critical Temperature

Not available.

Odor

Unpleasant

Viscosity

3.1641x10⁻³ Pa/s @ 139.39°C

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 oxidizing agents, acids.

Section XI. Toxicological Information**RTECS Number**

Not available.

Routes of Exposure

Eye Contact. Ingestion. Inhalation.

Toxicity Data

Not available.

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

Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. 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	Amylene's production and use in organic syntheses or as an octane additive may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 460 mm Hg at 25 deg C indicates amylene will exist solely in the vapor phase in the ambient atmosphere. Vapor-phase amylene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals, ozone, and nitrate radical; the half-life for these reactions in air is estimated to be 4.4 hrs, 39 mins, and 321 seconds, respectively. If released to soil, amylene is expected to have high mobility based upon an estimated Koc of 68. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 0.110 atm-cu m/mole. Amylene may potentially volatilize from dry soil surfaces based upon its vapor pressure. If released into water, amylene is not expected to adsorb to suspended solids and sediment in the water column based upon the estimated Koc. Using activated sludge inoculum with the Warburg respirometer test at 20 deg C, the percent theoretical biochemical oxygen demand after 24 hrs was 0.9% for amylene suggesting that biodegradation may be slow or that it is toxic to microorganisms. 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 2.5 and 80 hrs, respectively. An estimated BCF of 23 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups. Occupational exposure to amylene may occur through inhalation and dermal contact with this compound at workplaces where amylene is produced or used. The general population may be exposed to amylene via inhalation of ambient air with this compound and gasoline products containing amylene. Amylene is widely detected in the atmosphere.
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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 3: Flammable liquid
PIN Number	UN2460
Proper Shipping Name	2-Methyl-2-Butane
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)	208-156-3
EEC Risk Statements	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin.
Japanese Regulatory Data	ENCS no.: 2-19

Section XVI. Other Information

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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, 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.