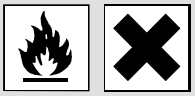
TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Combustible material; avoid heat and sources of ignition.** **Harmful compound, minimize exposure.** **Irritating to skin, eyes, and the respiratory system.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Undecane**

Catalog Number	U0002
Synonym	Hendecane
Chemical Formula	$C_{11}H_{24}$
CAS Number	1120-21-4

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

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
Undecane	1120-21-4	Min. 99.0%(GC)	Not available.	Rat LC_{50} (inhalation) 442 ppm/8H Mouse LD_{50} (intravenous) 517 mg/kg

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	Combustible.	Auto-Ignition	Not available.
Flash Points	65°C (149°F).	Flammable Limits	LOWER: 0.7% UPPER: 5.5%

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

SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
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

Combustible 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

COMBUSTIBLE. HARMFUL. IRRITANT. 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, reducing agents, alkalis (bases).

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.)	Solubility	Miscible in ethanol, ether, ethyl alcohol. Insoluble in water.
Specific Gravity	0.74 (water=1)		
Molecular Weight	156.31	Partition Coefficient	Log P_{ow} 5.74
Boiling Point	195°C (383°F)	Vapor Pressure	0.05 kPa (@ 25°C)
Melting Point	-26°C (-14.8°F)	Vapor Density	5.4 (Air = 1)
Refractive Index	1.418	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 oxidizing agents, reducing agents, alkalis (bases).

Section XI. Toxicological Information

RTECS Number

YQ1525000

Routes of Exposure

Eye Contact. Ingestion. Inhalation.

Toxicity Data

Rat LC_{50} (inhalation) 442 ppm/8H
Mouse LD_{50} (intravenous) 517 mg/kg

Chronic Toxic Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
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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.
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Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	n-Undecane's production and use in organic synthesis, jet-fuel research, manufacturing of paraffin products, the rubber industry, the paper processing industry, petroleum research, crude oil, as a solvent and distillation chaser, and its presence in automobile exhaust may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 0.412 mm Hg at 25 deg C indicates n-undecane will exist solely as a vapor in the ambient atmosphere. Vapor-phase n-undecane 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 29 hours. Based on data for n-hexane and iso-octane, n-undecane is not expected to absorb UV light in the environmentally significant range of >290 nm. If released to soil, n-undecane is expected to have no mobility based upon an estimated Koc of 24,000. Volatilization from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 1.9 atm-cu m/mole. However, adsorption to soil is expected to attenuate volatilization. Volatilization from dry soil surfaces should not be important given the vapor pressure of this compound. n-Undecane is aerobically biodegraded to 118% of its theoretical BOD in 28 days, and is susceptible to waste treatment. If released into water, n-undecane is expected to adsorb to suspended solids and sediment in water based on the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based on its estimated Henry's Law constant. Estimated volatilization half-lives from a model river and lake are 4 hours and 5 days, respectively. However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column. An estimated BCF of 3,600 suggests the potential for bioconcentration in aquatic organisms is very high. However, n-pentadecane, which has a BCF range of 6.8 to 20.4 in carp after 8 weeks exposure and is a structurally similar compound, may more accurately reflect the low potential of n-undecane for bioconcentration in aquatic organisms. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups. Occupational exposure to n-undecane may occur through inhalation and dermal contact with this compound at workplaces where n-undecane is produced or used. The general population may be exposed to n-undecane via inhalation of ambient air, ingestion of food and drinking water, and dermal contact with vapors, food and other products containing n-undecane.

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	UN2330
Proper Shipping Name	Undecane
Packing Group (PG)	III
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). CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). On DSL.
EINECS Number (EEC)	214-300-6
EEC Risk Statements	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)-10

Section XVI. Other Information

Version 1.0
Validated on 10/24/2006.
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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.