

## MATERIAL SAFETY DATA SHEET

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Version 1.5

## Section 1 - Product and Company Information

Product Name	PENTANE, REAGENT GRADE, 98%
Product Number	158941
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
N-PENTANE	109-66-0	No
Formula	C5H12	
Synonyms	Amyl hydride * Pentan (Polish) * Pentane (ACGIH:OSHA) * Pentanen (Dutch) * Pentani (Italian) * Skellysolve A	
RTECS Number:	RZ9450000	

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Flammable (USA) Extremely Flammable (EU). Harmful. Dangerous for the environment.

Extremely flammable. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Irritating to eyes, respiratory system and skin. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.

Target organ(s): Nerves. Heart.

## HMIS RATING

HEALTH: 1\*

FLAMMABILITY: 4

REACTIVITY: 0

## NFPA RATING

HEALTH: 1

FLAMMABILITY: 4

REACTIVITY: 0

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

## Section 4 - First Aid Measures

## ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

#### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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### Section 5 - Fire Fighting Measures

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#### FLAMMABLE HAZARDS

Flammable Hazards: Yes

#### EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

#### FLASH POINT

- 57.0 °F    - 49.0 °C    Method: closed cup

#### EXPLOSION LIMITS

Lower: 1.4 %    Upper: 8.3 %

#### AUTOIGNITION TEMP

260 °C

#### FLAMMABILITY

N/A

#### EXTINGUISHING MEDIA

Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

#### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

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### Section 6 - Accidental Release Measures

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#### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy

rubber gloves.

#### METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

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### Section 7 - Handling and Storage

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#### HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Open carefully.

#### STORAGE

Suitable: Keep container closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Store under nitrogen.

#### SPECIAL REQUIREMENTS

May develop pressure. Refrigerate before opening.

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### Section 8 - Exposure Controls / PPE

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#### ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

#### PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.  
Hand: Compatible chemical-resistant gloves.  
Eye: Chemical safety goggles.

#### GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

#### EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	600 PPM
USA	MSHA Standard-air	TWA	500 PPM (1475 MG/M3)
USA	OSHA.	PEL	8H TWA 1000 PPM (2950 MG/M3)
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	120 PPM
		Ceiling	co610 PPM/15M

#### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	1800 MG/M3
Poland		NDSch	2300 MG/M3
Poland		NDSP	-

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### Section 9 - Physical/Chemical Properties

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Appearance                      Physical State: Clear liquid

Color: Colorless

Property	Value	At Temperature or Pressure
Molecular Weight	72.15 AMU	
pH	N/A	
BP/BP Range	35.0 - 36.0 °C	
MP/MP Range	- 130.0 °C	
Freezing Point	N/A	
Vapor Pressure	434.28 mmHg	20 °C
Vapor Density	2.48 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.626 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.01 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 3.39	
Decomposition Temp.	N/A	
Flash Point	- 57.0 °F - 49.0 °C	Method: closed cup
Explosion Limits	Lower: 1.4 % Upper: 8.3 %	
Flammability	N/A	
Autoignition Temp	260 °C	
Refractive Index	1.358	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Lungs. Heart. Central nervous system.

## SIGNS AND SYMPTOMS OF EXPOSURE

Contact with eyes can cause redness, tearing, and blurred vision. Prolonged or repeated contact with skin can cause defatting and dermatitis. CNS depression. Damage to the lungs.

## TOXICITY DATA

Inhalation

Rat

364,000 mg/m<sup>3</sup>

LC50

Intravenous

Mouse

446 MG/KG

LD50

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## Section 12 - Ecological Information

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### ACCUMULATION

Bioaccumulation Potential: Indication of bioaccumulation.

### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 9.74 mg/l

### ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS

Because of harmful effects on water organisms, this material should not be introduced into drains. Avoid contamination of the environment

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: Pentanes

UN#: 1265

Class: 3

Packing Group: Packing Group II

Hazard Label: Flammable liquid

PIH: Not PIH

### IATA

Proper Shipping Name: Pentanes

IATA UN Number: 1265

Hazard Class: 3

Packing Group: II

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## Section 15 - Regulatory Information

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#### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F+-Xn-N

Indication of Danger: Extremely Flammable. Harmful. Dangerous for the environment.

R: 12-51/53-65-66-67

Risk Statements: Extremely flammable. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Harmful: may cause lung damage if swallowed.

Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.

S: 9-16-29-33-61-62

Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges. Avoid release to the environment. Refer to special instructions/safety data sheets. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

#### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Extremely Flammable (EU). Harmful. Dangerous for the environment.

Risk Statements: Extremely flammable. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Irritating to eyes, respiratory system and skin. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.

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US Statements: Target organ(s): Nerves. Heart.

#### UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

#### CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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#### Section 16 - Other Information

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#### DISCLAIMER

For R&D use only. Not for drug, household or other uses.

#### WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice

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