

MATERIAL SAFETY DATA SHEET

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Version 1.14

Section 1 - Product and Company Information

Product Name	PYRIDINE, REAGENTPLUSTM, >=99%
Product Number	320498
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
PYRIDINE	110-86-1	Yes
Formula	C5H5N	
Synonyms	Azabenzene * Azine * NCI-C55301 * Piridina (Italian) * Pirydyna (Polish) * Pyridin (German) * Pyridine (ACGIH:OSHA) * RCRA waste number U196	
RTECS Number:	UR8400000	

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Harmful.
Harmful by inhalation, in contact with skin and if swallowed. Risk
of serious damage to eyes.
Possible Carcinogen (US). Calif. Prop. 65 carcinogen. Readily
absorbed through skin. Unpleasant odor. Target organ(s): Liver.
Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
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 immediately.

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.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions. Forms explosive mixtures in air.

FLASH POINT

62.6 °F 17 °C Method: closed cup

EXPLOSION LIMITS

Lower: 1.8 % Upper: 12.4 %

AUTOIGNITION TEMP

482 °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): Emits toxic fumes under fire conditions.
Vapor may travel considerable distance to source of ignition and flash back.
Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

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.

Section 7 - Handling and Storage

HANDLING

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

STORAGE

Suitable: Keep container closed. Keep away from heat, sparks, and open flame. Packaged under nitrogen in SURE/SEAL bottles. SURE/SEAL is a trademark of Aldrich Chemical Company, Inc. Handle and store under nitrogen.

SPECIAL REQUIREMENTS

Packaged under inert gas. Handle and store under inert gas.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Remove and wash contaminated clothing promptly.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	5 PPM
USA	MSHA Standard-air	TWA	5 PPM (15 MG/M3)
USA	OSHA.	PEL	8H TWA 5 PPM (15 MG/M3)
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	5 PPM

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	5 MG/M3
Poland		NDSch	30 MG/M3
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Liquid Color: Colorless Odor: Unpleasant odor.	
Property	Value	At Temperature or Pressure
Molecular Weight	79.1 AMU	
pH	8.5	

BP/BP Range	115 °C	760 mmHg
MP/MP Range	- 42.0 °C	
Freezing Point	- 42.0 °C	
Vapor Pressure	20 mmHg	25 °C
Vapor Density	2.72 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.978 g/cm3	
Bulk Density	N/A	
Odor Threshold	< 1 ppm	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 0.65	
Decomposition Temp.	N/A	
Flash Point	62.6 °F 17 °C	Method: closed cup
Explosion Limits	Lower: 1.8 % Upper: 12.4 %	
Flammability	N/A	
Autoignition Temp	482 °C	
Refractive Index	1.51	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Soluble.	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Heat.

Materials to Avoid: Strong oxidizing agents, Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and nitrogen oxides, Cyanides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: Harmful if absorbed through skin. Readily absorbed through skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Bone marrow. Nerves. Liver. Kidneys.

SIGNS AND SYMPTOMS OF EXPOSURE

Dose-related side effects may include:anorexia, nausea, vomiting, headache, dizziness, tachycarida, nervousness, insomnia, skin disorders Symptoms of exposure may include

burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

TOXICITY DATA

Oral

Rat

891 mg/kg

LD50

Skin

Rabbit

1,121 mg/kg

LD50

Inhalation

Rat

9,015 ppm

LC50

Oral

Rat

891 mg/kg

LD50

Remarks: Behavioral:Coma. Behavioral:Somnolence (general depressed activity). Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Ptosis.

Inhalation

Rat

28,500 mg/m³

LC50

Remarks: Lungs, Thorax, or Respiration:Dyspnea. Behavioral:Somnolence (general depressed activity). Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation.

Intraperitoneal

Rat

866 MG/KG

LD50

Subcutaneous

Rat

866 MG/KG

LD50

Intravenous

Rat

360 MG/KG

LD50

Remarks: Behavioral:Sleep. Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea.

Oral

Mouse

1500 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Behavioral:Sleep.

Intraperitoneal

Mouse

950 MG/KG

LD50

Subcutaneous

Mouse

1250 MG/KG

LD50

Remarks: Behavioral:Sleep. Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea.

Intravenous

Mouse

420 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Dyspnea.
Behavioral:Somnolence (general depressed activity).
Behavioral:Sleep.

Intravenous

Dog

880 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Respiratory depression.
Vascular:BP lowering not characterized in autonomic section.
Cardiac: Change in rate.

Skin

Rabbit

1121 mg/kg

LD50

Remarks: Behavioral:Ataxia. Liver:Other changes.
Gastrointestinal:Changes in structure or function of salivary glands.

Skin

Guinea pig

1000 mg/kg

LD50

Oral

Mammal

1500 mg/kg

LD50

Inhalation

Mammal

10,000 mg/m³

LC50

IRRITATION DATA

Eyes

Rabbit

90 %

24 HR

Remarks: Application of 90% solution resulted in severe reaction with clouding of the cornea and scarring of the conjunctiva. Permanent mild stromal opalescence and subepithelial vascularization occurred.

Skin

Rabbit

500 mg

24H

Remarks: Mild irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Species: Rat

Route of Application: Oral

Dose: 24024 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Kidney, Ureter, Bladder:Tumors. Tumorigenic:Neoplastic by RTECS criteria.

Species: Mouse

Route of Application: Oral

Dose: 25480 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Liver:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

IARC CARCINOGEN LIST

Rating: Group 3

NTP CARCINOGEN LIST

Rating: Clear evidence.

Species: Mouse

Route: Drinking

ACGIH CARCINOGEN LIST

Rating: A3

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish

Species: Pimephales promelas (Fathead minnow)

Time: 96 h

Value: 93.8 mg/l

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 940 mg/l

Test Type: LC50 Fish

Species: Cyprinus carpio

Time: 96 h

Value: 26 mg/l

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 1,140 mg/l

Test Type: EC50 Daphnia

Species: Daphnia pulex

Time: 48 h

Value: 520 mg/l

Test Type: EC50 Algae
Species: SELENASTRUM
Time: 72 h
Value: 100.0 - 180.0 mg/l

Section 13 - Disposal Considerations

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.

Section 14 - Transport Information

DOT

Proper Shipping Name: Pyridine
UN#: 1282
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Pyridine
IATA UN Number: 1282
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F-Xn
Indication of Danger: Highly Flammable. Harmful.
R: 11-20/21/22
Risk Statements: Highly flammable. Harmful by inhalation, in contact with skin and if swallowed.
S: 26-28
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap-suds.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU). Harmful.
Risk Statements: Harmful by inhalation, in contact with skin and if swallowed. Risk of serious damage to eyes.
Safety Statements: Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.
US Statements: Possible Carcinogen (US). Calif. Prop. 65 carcinogen. Readily absorbed through skin. Unpleasant odor. Target organ(s): Liver. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer.

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

Section 16 - Other Information

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 or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.