



SIGMA-ALDRICH

Material Safety Data Sheet

Date Printed: 01/13/2004
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Version 1.20

Section 1 - Product and Company Information

Product Name	PAPAIN LYOPHILIZED
Product Number	P4762
Brand	Sigma Chemical
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS, MO 63103 US
Technical Phone:	314 771 5765
Fax:	800 325 5052
Emergency Phone:	414 273 3850 Ext. 5996

Section 2 - Composition/Information on Ingredient

<u>Substance Name</u>	<u>CAS #</u>	<u>SARA 313</u>
PAPAIN	9001-73-4	No

Formula
Synonyms Arbuz, Caroid, Nematolyt, Papayotin, Summetrin, Tromasin, Vegetable pepsin, Velardon, Vermizym

Section 3 - Hazards Identification

Emergency Overview
Harmful.
Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation.

HMIS Rating
Health: 3* Flammability: 0 Reactivity: 1

NFPA Rating
Health: 3 Flammability: 0 Reactivity: 1

*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.

Section 5 - Fire Fighting Measures

Autoignition Temp: N/A

Extinguishing Media

Suitable

Water spray, Carbon dioxide, dry chemical powder, or appropriate foam.

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.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill

Evacuate area.

Procedure(s) of Personal Precaution(s)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling

User Exposure

Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Storage

Suitable

Keep tightly closed. Freeze.

Special Requirements

Light sensitive Freeze.

Section 8 - Exposure Controls / PPE

Engineering Controls

Safety shower and eye bath. Mechanical exhaust required.

Personal Protective Equipment

Respiratory

Government approved respirator.

Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

General Hygiene Measures
Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	
Physical State	Solid
Molecular Weight:	N/A
pH	N/A
BP/BP Range	N/A
MP/MP Range	N/A
Freezing Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Saturated Vapor Conc.	N/A
SG/Density	N/A
Bulk Density	N/A
Odor Threshold	N/A
Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Partition Coefficient	N/A
Decomposition Temp.	N/A
Flash Point °F	N/A
Flash Point °C	N/A
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Solubility	N/A

N/A = not available

Section 10 - Stability and Reactivity

Stability
Stable.
Stable.
Conditions to Avoid
Sensitive to light.
Materials to Avoid
Oxidizing agents.

Hazardous Decomposition Products
Hazardous Decomposition Products
Nature of decomposition products not known.

Hazardous Polymerization
Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure

Skin Contact

Causes skin irritation.

Skin Absorption

May be harmful if absorbed through the skin.

Eye Contact

Causes eye irritation.

Inhalation

Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion

May be harmful if swallowed.

Sensitization

Respiratory

May cause allergic respiratory reaction.

Signs and Symptoms of Exposure

Exposure can cause asthma, skin eruptions, emphysema, anaphylactic shock, and proteolytic action. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: RU4950000

Toxicity Data

Oral - Rat: > 4,000 mg/kg (LD50)

Oral - Mouse: 12,500 mg/kg (LD50)

Remarks: Lungs, Thorax, or Respiration: Dyspnea.
Gastrointestinal: Hypermotility, diarrhea.
Skin and Appendages: Other: Hair.

Chronic Exposure - Teratogen

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	750 MG/KG	Oral	(13D PREG)
		Result: Specific Developmental Abnormalities: Other developmental abnormalities.	
Rat	750 MG/KG	Oral	(8-17D PREG)
		Result: Specific Developmental Abnormalities: Musculoskeletal system.	
Rat	1500 MG/KG	Oral	(10-11D PREG)
		Result: Specific Developmental Abnormalities: Central nervous system.	
Rat	750 MG/KG	Oral	(8D PREG)
		Result: Specific Developmental Abnormalities: Hepatobiliary system. Specific Developmental Abnormalities: Urogenital system.	
Rat	375 MG/KG	Intraperitoneal	(8D PREG)
		Result: Specific Developmental Abnormalities: Hepatobiliary system. Specific Developmental Abnormalities: Urogenital system.	
Rat	375 MG/KG	Intraperitoneal	(12D PREG)
		Result: Specific Developmental Abnormalities: Homeostasis	
Rat	375 MG/KG	Intraperitoneal	(8-17D PREG)
		Result: Specific Developmental Abnormalities: Musculoskeletal system.	
Rat	750 MG/KG	Intraperitoneal	(8D PREG)
		Result: Specific Developmental Abnormalities: Central nervous system.	

Chronic Exposure - Reproductive Hazard

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	375 MG/KG	Intraperitoneal	(12D PREG)
		Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Other developmental abnormalities. Effects on Embryo or Fetus: Fetal death.	

Rabbit 500 MG/KG Oral (16-18D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4).

Rabbit 500 MG/KG Intraperitoneal (17D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4).

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: Xn

Indication of Danger

Harmful.

Risk Statements R: 36/37/38 42

Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation.

Safety Statements S: 22 24 26 36/37

Do not breathe dust. Avoid contact with skin. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves.

US Classification and Label Text

Indication of Danger

Harmful.

Risk Statements

Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation.

Safety Statements

Do not breathe dust. Avoid contact with skin. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

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: No

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. 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 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.