



BERNARDO CHEMICALS Inc.

P.O. BOX 1632 · TURLOCK CA 95381 · Phone (209) 634-1191 · Fax: (209) 634-1192

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Casa Bernardo Ltda.	REG./EMERGENCY TEL. NO.: 55 13 4601212
ADDRESS: Rod. Pde. Manoel da Nobrega, km 65	FAX: (55) (13) 460-1318 OR (55) (13) 4601445
Gleba 37 · Pque. Ind. Imigrantes	REGULAR TELEPHONE NO.: (209) 634-I 191
Samarita · Sao Vicente · Sao Paulo · Brazil	FAX: (209) 634-I 192
DISTRIBUTOR'S NAME: BERNARDO CHEMICALS INC.	EMERGENCY NUMBER: (209) 634-I 191
ADDRESS: P.O. BOX 1632 · TURLOCK CA 95381	FAX: (209) 634-1192
Phone (209) 634-1191 · Fax: (209) 634-1192	
TRADE NAME: EPA. REG. NO.:	
GASTOXIN TABLETS 43743-1	
GASTOXIN PELLETS 43743-2	CHEMTREC: I-800-424-9300 · 24 HOURS
FUMIGATION SACHETS 43743-3	

II HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	CAS NO.	%	TLV	HAZARD DATA
1. Aluminum Phosphide · AIP on exposure to air or water produces: Phosphine · Hydrogen Phosphine · PH3	20859-73-8 7803-51-2	57 N/A	N/A 0.3 ppm	Flammable Flammable at 17,900 ppm
2. Ammonium Carbamate On exposure to air or water produces: Ammonia · NH3 Carbon Dioxide · CO2	1111-78-0 7664-41-7 124-38-g	15 N/A N/A	N/A 25 ppm 5,000 ppm	N/A N/A N/A

III PHYSICAL DATA

Boiling Point 760 MM MG	Solid N/A	PH3 -87.7%	Melting Point	Solid N/A	PH3 133.5°C
Specific Gravity	N/A	N/A	Valor Pressure	N/A	33.5 @ 20°C
Vapor Density	N/A	1.184	Solub. in H2O % by Wt.	Insol.	Slightly Sol.
% Volatiles Bv Volume	N/A	N/A	Evapor. Rate	N/A	N/A
Appearance	Grey/Green	Colorless	Wt/Vol	2.429/cm3	N/A
Odor	Carbide-like;	Garlic			

IV FIRE AND EXPLOSION DATA

Flash Point (Test Method): 100° c Auto-Ignition Temperature 100° C -150° C

Flammable Limits in Air % by Vol.: Lower 1.79% Upper N/A

Extinguishing Media: Sand, CO2. Ventilation, with air, will effectively reduce PH3 concentrations below flammable limits.

Special fire fighting procedures: DO NOT USE WATER. Physically spread the burning mass
Wear MSHA/NIOSH approved positive pressure SCBA.

Unusual fire and explosion hazard: Toxic gases (such as Oxides os Phosphorous, Phosphoric Acid, & Hydrogen) may be released in a Phosphine fire. They are not flammable but exposure to moist air, water, and some other liquids release flammable Phosphine gas. Spontaneous ignition may result - if contacted by water, other liquids, or if confined.

V HEALTH HAZARD INFORMATION

SEE E.P.A. LABELING

Health Hazard Data: Primary Route(s) of Entry 1. Inhalation of Gas 2. Ingestion of solid POISON

Routes of Exposure:

Inhalation: TLV/TWA 0.3 ppm

Skin Contact: No known dermal toxicity · wear cotton gloves

Skin Absorption: N/A

Eye Contact: Gas may enter membranes on exposure · DO NOT WEAR contact lens

Ingestion: Causes lungs & brain symptoms, but damage to viscera is more common

V HEALTH HAZARD INFORMATION cont.

Effects of Over Exposure: (Symptoms) Fatigue, nausea, chest pain, uneasiness, vomiting, stomachache

Acute Overexposure: Diarrhea. Dyspnea

Chronic Overexposure: Not known to occur

Emergency and First Aid Procedures:

Eyes: Flush with plenty of water for at least 15 minutes Get medical attention.

Skin: Wash contaminated skin thoroughly with soap and water

Inhalation: Get exposed person to fresh air. If breathing has stopped, administer artificial resuscitation. Call physician immediately.

Ingestion: Call a physician or poison control center If conscious administer water and induce vomiting.

If available, give SYRUP of IPECAC Call a physician Immediately.

NOTES TO PHYSICIAN: Acute and chronic effects: Highly Toxic. In sufficient quantity it affects the liver, kidneys, lungs, nervous system, and circulation system. Inhalation causes lung edema and hyperemia, small perivascular brain hemorrhages and edema. Ingestion causes lung and brain symptoms but also damage to viscera is more common.

Phosphine poisoning may cause (1) lungs-pulmonary edema, (2) liver-elevated serum GOT, LDH, and alkaline phosphatase, reduced prothrombin, hemorrhage and jaundice. (3) kidney-hematuria and anuria.

The pathology is characteristic of hypoxia Frequent exposure to low concentrations above permissible levels over a period of days or weeks may cause poisoning Severe acute poisoning may cause permanent damage.

Chronic poisoning not known to occur

Carcinogenicity: Not listed: IARC, OSHA, NTP

VI REACTIVITY DATA

Conditions Contributing to Instability: Temperature above 100°C (212°F)

Incompatibility: Liquid water, acids. Corrodes gold. silver. copper. brass, other precious metals and their alloys.

Hazardous Decomposition Products: Phosphine Gas · Hydrogen Phosphide PH₃

Conditions Contributing to Hazardous Polymerization: N/A

VII SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled: A spill, other than incidental to application or normal handling, may produce high levels of gas and, therefore, attending personnel must wear SCBA or its equivalent when the concentration of hydrogen phosphide gas is unknown. Other NIOSH/MSHA approved respiratory protection may be worn if the concentration is known. Do not use water at any time to clean up a spill of gastoxin® water in contact with unreacted metal phosphides will greatly accelerate the production of hydrogen phosphide gas which could result in a toxic and/or fire hazard. Wear gloves of cotton or other material when handling gastoxin® For more specific instructions, concerning damaged containers, refer to the gastoxin® product use manual

Neutralizing Chemicals: CO₂

Waste Disposal Method: Unreacted or partially reacted tablets or pellets that must be disposed of are hazardous waste. However, if properly exposed the residual dust remaining after fumigation will be a grayish-white, spent, nonhazardous waste which according to RCRA regulations can be disposed of at a sanitary landfill Some local or state regulations may vary, so disposal procedures should be reviewed with appropriate authorities

VIII SPECIAL PROTECTION INFORMATION

Ventilation Requirements: Ventilation: Forced air ventilation and/or appropriate work practices should be used where needed to reduce exposure. Passive or forced ventilation is necessary prior to reentry by unprotected workers. They may also be required in enclosed areas which are attached to a fumigated site.

Specific Personal Protective Equipment: Respiratory: A NIOSH/MSHA approved, full face gas mask - Phosphine canister combination may be used at levels up to 15 ppm. Above this level or in situations where the Hydrogen Phosphide concentration is unknown, a NIOSH/MSHA approved SCBA or its equivalent must be used.

Eye: None

Gloves: Dry cotton gloves

Other Clothing and Equipment: Equipment for detection of Phosphine should be available.

IX SPECIAL PRECAUTIONS

Precautionary Statements: Conspicuous warning signs must be secured to the area. WARNING SIGNS — DANGER POISON GAS — DO NOT ENTER. Others: (International) Warning Signs — Flammable Solid - 4.1 — Dangerous When Wet - 4.3

Other Handling and Storage Requirements: Stocks of any preparation that contains Aluminum Phosphide must be stored under lock and key in dry, well ventilated premises. Warning notices specifying the danger of unauthorized entry should be placed in prominent positions at all points of access to the store Tablets, Pellets, Sachets should be handled with care, Spontaneous combustion may occur when sealed packages, such as tubes containing Aluminum Phosphide preparations are opened. Containers should not be opened in atmosphere where there is a risk of dust explosion.

Prepared by: BERNARDO CHEMICALS INC.

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