



CURE CHEM INDIA

The Chemical People

A-85, 1ST FLOOR, MASOODPUR MAIN ROAD, VASANT KUNJ, NEW DELHI-110070 (INDIA)
TEL: (91-11) 26898689, 26139884, MOBILE: 9811213932, FAX: (91-11) 26123165
EMAIL: kutty@curechem.com WEB: <http://www.curechem.com>

MATERIAL SAFETY DATA SHEET
FUMATE (Aluminium Phosphide 56 % Tablets)

SECTION 1: Product name, description, supplier & emergency nos.

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY

Company: CURE CHEM INDIA

Telephone: + 9111 26898689, 26139884,

Fax: + 91-11 26123165

E-mail: kutty@curechem.com

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Product name: Fumate (Aluminium Phosphide 56 %)

Product use: Insecticide/Fumigant

SECTION 2: Chemical composition and common name.

Common name: Aluminium Phosphide

Chemical name: Aluminium Phosphide

Trade names: FUMATE

Type of pesticide: Insecticide/Fumigant.

Chemical family: Inorganic Phosphide.

Empirical formula: ALP

Molecular weight: 58.0

SECTION 3: HAZARD IDENTIFICATION: HAZARDOUS INGREDIENT

MATERIAL OR COMPONENT	CAS NO.	%	HAZARD DATA
Aluminium Phosphide	20859-73-8	56.0	Fire hazard
produces Phosphine-PH ₃	7803-51-2	N/A	Flammable at 17,900 ppm



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II. HAZARD CLASSIFICATION FOR INTERNATIONAL TRANSPORT

UN NUMBER	:	3048
CORRECT SHIPPING NAME	:	ALUMINIUM PHOSPHIDE/FUMATE
CLASS	:	6.1
HAZCHEM CODE	:	4WE
EPG IDENTIFICATION	:	4B3
PACKAGING GROUP	:	I
PACKAGING METHOD	:	5.9.4.1

SECTION 4: First Aid measures.

First aid measures and medical treatment in case of phosphine and metal phosphide poisoning

First Aid measures in case of phosphine inhalation:

Remove from exposure area to fresh air and keep at rest.

If the patient is unconscious, place in semi-prone recovery position or otherwise maintain the airway. If the patient is conscious, but has difficulty in breathing, treat in a seated position and give oxygen if available. Otherwise, allow the patient to recline with the legs slightly elevated. If breathing stops: immediately ventilate the patient artificially (mouth-to-mouth/ nose or mechanically with oxygen if available).

First aid in case of the metal phosphide ingestion:

Do not give milk, fats or saline emetics by mouth.

Give oxygen if there is respiratory distress.

If the first aider is medically authorized to do so, and the patient is conscious, induce vomiting.

After 20 minutes (or after vomiting), administer activated charcoal (50 g in water by mouth) if available. Obtain medical attention as soon as possible: preferably send immediately to hospital.

MEDICAL TREATMENT:



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Medical treatment in case of inhalation of phosphine:

Give oxygen by mask if required; perform base line chest X-ray and examine chest. Treat shock conventionally.

The patient should be observed for 48-72 hours, as onset of pulmonary oedema may be delayed. In severe respiratory distress: give methylprednisolone 30 mg/kg, or equivalent, intramuscularly, preferably within 4 hours of exposure.

If pulmonary oedema occurs, treat by positive and expiratory pressure ventilation. Antibiotics should only be given if secondary infection is present. Treat any fits conventionally; give general supportive care with particular attention to fluid balance.

Medical treatment in case of ingestion of metal phosphide:

Consider tracheal intubation and gastric lavage with 2 % sodium bicarbonate solution. Activated charcoal medicinal liquid paraffin may limit absorption of phosphine and may be administered by mouth or stomach tube. Monitor and support vital functions, particularly hepatic and renal function. Treat shock conventionally.

SECTION 5: Fire fighting measures.

FIRE AND EXPLOSION DATA

Fire and Explosion

Hazard: Toxic gases (such as oxides of phosphorus, 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.

Fire fighting media: Sand, CO₂. Ventilation, with air, will effectively reduce PH₃ concentrations below flammable limits.

Special Fire fighting

Procedure: DO NOT USE WATER OR FOAM. Extinguish using agent for type of fire. Avoid breathing fumes from burning materials.



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**SECTION 6: Accidental release measures:
ACCIDENTAL RELEASE, SPILL OR LEAKAGE PROCEDURES**

Steps to be taken in case: A spill, other than of material leakage and incidental to application or spillage. 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 Fumate. Water in contact with untreated 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 Fumate.

Neutralizing Chemicals: CO₂

Waste disposal: Untreated or partially reacted tablets or pellets that must be disposed of are hazards waste. However, if properly exposed the residual dust remaining after fumigation will be grayish-white, spent, non hazardous waste which can be disposed of at sanitary land fill. Some local or state regulations may vary, so disposal procedures should be reviewed with appropriate authorities.

SECTION 7: Handling and storage information.

SPECIAL PROTECTION, HANDLING AND STORAGE INFORMATION

Ventilation requirement: 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 re-entry by unprotected workers. They may also be required in enclosed areas which are attached to a fumigated site.

Specific Personal: Respiratory: A NIOSH/MSHA

Protective Equipment: 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.

Clothing: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Gloves : Dry cotton gloves.



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Eyes: Employee must wear splash proof or dust resistant safety goggles to prevent eye contact with this substance.

Emergency wash facilities: The employer should provide an eye wash fountain within the immediate work area for emergency use.

Storage and Transport: Store away from other chemicals, foodstuffs, and animal feed, children, and unauthorized personal. Do not load together with food and animal food.

SECTION 8: Exposure control and personal protection:

Specific Personal:

Respiratory: A NIOSH/MSHA

Protective Equipment: 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.

Clothing: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Gloves : Dry cotton gloves

Eyes: Employee must wear splash proof or dust resistant safety goggles to prevent eye contact with this substance.

Precaution to be taken in handling and storing:

Conspicuous warning signs must be secured to the area. WARNING SIGNS - DANGER POISON GAS - DO NOT ENTER.

Other Precautions: Stocks of any preparation that contains Aluminium 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 Aluminium Phosphide preparations are opened. Containers should not be opened in atmosphere where there is a risk of dust explosion.



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SECTION 9: Physical and chemical properties:

PHYSICAL AND CHEMICAL DATA

Description ALP: Grayish Tablets.

Odour: Garlic-like

Melting Point : > 1000°C (for technical)

Density: 2.85 at 25°C (for technical)

Solubility: In water: Insoluble in water reacts with water to liberate phosphine.

Stability: Though stable when dry, it reacts with moist air, violently with acids, producing phosphine gas.

SECTION 10: Stability and reactivity

Stability & reactivity: Though stable when dry, it reacts with moist air, violently with acids, producing phosphine gas.

SECTION 11: Toxicological information.

TOXICOLOGICAL DATA

Acute Toxicity:

Aluminium phosphide is not absorbed dermally; the main routes of exposure are through ingestion and inhalation. It is highly toxic via both these routes. The reported rodent oral LD50 is 11.5 mg/kg for the refined version, with that for the technical compound presumably lower. Aluminium phosphide ingested orally reacts with water and stomach acids to produce phosphine gas, which may account in a large part for observed toxicity.

Phosphine generated in the gastrointestinal tract is readily absorbed in to the bloodstream, and it is readily absorbed through the lung epithelium. The rodent 4-hour inhalation LC50 for phosphine gas (the product of phosphide reaction with water) is widely reported as: 15mg/m³ (15µg/L, or approximately 10.7 ppm). Recent study indicates that the rodent 4-hour inhalation LC50 may exceed 15 mg/m³. Symptoms of mild to moderate acute Aluminium phosphide toxicity include nausea, abdominal pain, and tightness in chest, excitement, restlessness, agitation and chills.



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Symptoms of more severe toxicity include: diarrhoea, cyanosis, difficulty breathing, pulmonary oedema, respiratory failure, tachycardia (rapid pulse) and hypotension (low blood pressure), dizziness and/or death.

Convulsions have been reported in lab animals exposed to high concentrations of phosphine. Mild exposure is reversible

Chronic Toxicity: There is no evidence available that shows cumulative or chronic toxicity symptoms. Reproductive Effects: The available evidence for reproductive effects in animals suggest that reproductive effects are not likely in humans under normal conditions.

Teratogenic Effects: The available evidence for teratogenic effects in animals suggests that such effects are not likely in humans under normal conditions.

Mutagenic Effects: No evidence was available regarding the ability of Aluminium phosphide or phosphine to cause mutations or increase the mutation rate.

Carcinogenic Effects: No data are currently available; it is possible that some testing on the oncogenicity may be initiated in the near future.

Organ Toxicity: Acute toxicity resulting from Aluminium phosphide exposure is apparent most immediately in the heart and lungs; it may also affect the central nervous system, liver and kidneys.

Fate in Humans & Animals: Aluminium phosphide rapidly reacts with water to form highly toxic phosphine gas. It has been reported that Aluminium phosphide may be absorbed directly into the bloodstream, although this is probably a very minor route of entry. That phosphine which is not expired through the lungs may be metabolized to phosphates, hypophosphite and phosphite.

Health hazard data: Highly toxic by ingestion/inhalation and moderately toxic by dermal absorption.

Inhalation: Rat LC₅₀ – 34.6 ppm.

Acute oral: **Rat LD₅₀: 7.271 mg/kg bodyweight**

Acute dermal: Rat LD₅₀: 50 mg/kg bodyweight

Skin contact: No absorption through the skin. Fumate is non-irritant to rabbit skin.



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Eye contact: Gas may enter membranes on exposure. DO NOT WEAR contact lens, Non-irritant to rabbit eye.

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

Effects on exposure: (Symptoms) Fatigue, nausea, chest pain, uneasiness, vomiting, stomach ache.

Acute exposure: Diarrhea, Dyspnea

Chronic exposure: Not known to occur.

SECTION 12: ECOLOGICAL INFORMATION

Effects on Birds: The precise oral or inhalation median lethal doses for Aluminium phosphide or phosphine in birds are not known. It is reported that exposure of turkeys and hens to 211 and 224 mg/m³ for 74 and 59 minutes respectively resulted in laboured breathing, swelling of organs, tonic-clonic convulsions and death.

Effects on Aquatic Species: The reported acute LC₅₀ is 4.1 µg/L in rainbow trout, indicating very high toxicity. No data were available regarding the specific toxicity of Aluminium phosphide or of phosphine to other fish or aquatic species (e.g. LC₅₀ or EC₅₀ values), but due to the mechanism of action it is likely that it will be very highly toxic to them as well.

Effects on Other Animals (Non target species): No data were available.

ENVIRONMENTAL FATE:

Breakdown of Chemical in Soil and Groundwater: Aluminium phosphide will break down spontaneously in the presence of water to form a gaseous product, and so it is non-persistent and non-mobile in the soil environment, and poses no risk to groundwater.

Breakdown of Chemical in Surface Water: It is highly unlikely that Aluminium phosphide or phosphine will be found in surface waters.

Breakdown of Chemical in Vegetation: No data were available.

SECTION 13: Disposal information:

Waste disposal: Untreated 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 grayish-white, spent, non hazardous waste which can be disposed of at sanitary land fill. Some local or state regulations may vary, so disposal procedures should be reviewed with appropriate authorities.



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Disposal of used tins / flasks: Used tins and flasks must be buried in sand or disposed as per the disposal regulations in the country of use.

SECTION 14: Transport information:

HAZARD CLASSIFICATION FOR INTERNATIONAL TRANSPORT

UN NUMBER: 3048

CORRECT SHIPPING NAME: ALUMINIUM PHOSPHIDE/FUMATE

CLASS: 6.1

HAZCHEM CODE: 4WE

EPG IDENTIFICATION: 4B3

PACKAGING GROUP: I

PACKAGING METHOD: 5.9.4.1

SECTION 15: REGULATORY INFORMATION:

The product is registered in the country of import (INDIA), under the brand name FUMATE.

SECTION 16: Other information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall we be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if we have been advised of the possibility of such damages.