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ALUMINIUM PHOSPHIDE

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MATERIAL SAFETY DATA SHEET - ALUMINIUM PHOSPHIDE

SL NO.	PARTICULARS	PRODUCT DETAILS
1.0	IDENTITY OF MATERIAL	
1.1	Product Name	Aluminium Phosphide
1.2	Trade Name	SYNFUME
1.3	Chemical Designation	Metal phosphide
1.4	Synonyms	Aluminium monophosphide
1.5	Formula	AIP
1.6	Label Class	4.3 Packing Group - I
1.7	Category	Insecticide/Fumigant/Rodenticide
1.8	CAS Number	20859-73-8
1.9	UN Number	1397
1.10	Regulated Identification	Aluminium phosphide
1.11	Shipping Name	Aluminium Phosphide Formulation
1.12	Codes/Label	Dangerous when wet and Toxic
1.13	HAZCHEM Code	NA
1.14	Hazardous Waste Identification No.	NA
1.15	Hazardous Ingredients with CAS No.	Phosphine - 7803-51-2

2.0	PHYSICAL & CHEMICAL PROPERTIES	
2.1	Physical State (Gas/liquid/solid)	Solid
2.2	Appearance	Dark grey to Green
2.3	Odour.	Garlic-like odour
2.4	Others (Corrosivity etc.)	Not corrosive by itself, however phosphine gas released on hydrolysis is highly ca especially to noble metals.
2.5	Boiling Point	N/A
2.6	Melting Point	>1000 deg C
2.7	Vapour Density (air=1)	N/A
2.8	Specific Gravity (water=1)	2.85
2.9	Vapour Pressure	N/A
2.10	Evaporation rate	N/A
2.11	Solubility in water	Insoluble reacts with water
2.12	pH	pH of 10% slurry - 7.2

3.0	FIRE AND EXPLOSIVE HAZARDS DATA	
3.1	Explosion/Flammability	Not flammable by itself. On hydrolysis, it releases phosphine gas which auto-igni 38degC.
3.2	Flash Point LEL % UEL %	Phosphine - 1.8%
3.3	Auto ignition	N/A
3.4	TDG Flammability (Classification)	N/A

4.0	REACTIVE HAZARDS:	
4.1	Stability	Stable when dry. However it decomposes to phosphine on contact with moisture.
4.2	Impact (Haz Combustion products)	Phosphine gas is released on hydrolysis or on contact with acids. Phosphine gas in nature, flammable & corrosive to all noble metals.
4.3	Static Discharge (Haz. Combustion products)	N/A
4.4	Reactivity (Conditions to avoid)	Highly reactive with water & acids.
4.5	Hazardous Polymerization	Nil
4.6	Incompatibility	Reacts with water, acids. Should not be used in a combination with other chemica

5.0	HEALTH HAZARD DATA	
5.1	Routes of entry	Inhalation, ingestion.
		Inhalation: Sore throat cough shortness of breath, headache, dizziness, nausea &

5.2	Effects of exposure/symptoms	Skin: Redness with burning sensation. Eye: Redness Ingestion: Nausea, vomiting, diarrhea, abdominal pain, headache, convulsions, shock, collapse, unconsciousness.
5.3	LD50 (in rat) mg/kg	17.38 mg/kg
5.4	LC50 (in rat)	Phosphine - 220 mg.h/m ³
5.5	Permissible exposure Limit (PEL)	ppm mg/cu.m
5.6	Threshold limit value (TLV or ACGIH)	0.3 ppm/8 hours/5 days a week - Phosphine ACGIH - 2 mg/m ³
5.7	Emergency treatment	A. INHALATION OF PHOSPHINE: (i) Remove patient from exposure, keep at rest. Rescuers should follow full safety procedures. (ii) If the patient is unconscious, place in semi-prone recovery position or otherwise the airway. (iii) If patient is conscious but has difficulty in breathing, treat in a seated position with oxygen if available. (iv) Allow patient to recline with the legs slightly elevated. (v) If breathing stops, immediately ventilate the patient artificially (mouth to mouth/mechanically with oxygen available) (vi) If the heart stops, begin cardiopulmonary resuscitation-CPR. B. INGESTION OF ALUMINIUM PHOSPHIDE: (i) Do not give milk, fats, or saline emetics by mouth. (ii) Give oxygen if there is respiratory distress (iii) If first aiders are medically authorized to do so, and the patient is conscious, induce vomiting (iv) After 20 min (or after vomiting), administer activated charcoal (50gm in water) or give carbocysteine, if available. (v) Obtain medical attention as soon as possible; preferably send immediately to hospital

6.0	HAZARD SPECIFICATION	
6.1	NEPA Hazard Signal	Dangerous when wet
6.2	Health	Highly poisonous. Reacts with water, acid & moisture to release toxic phosphine
6.3	Flammability	Not flammable by itself, however on hydrolysis releases flammable phosphine gas
6.4	Stability	Reacts with water, atmospheric moisture and acids.
6.5	Special	Refer 6.4
6.6	KNOWN HAZARDS	
	Combustible liquid:	No
	Flammable material:	No
	Pyrophonic Material:	No
	Unstable Material:	No
	Explosive Material:	No
	Water reactivity:	Yes
	Oxidizer:	No
	Organic Peroxide:	Yes
	Sensitizer:	Yes
	Carcinogen:	No
	Mutagen:	No
	Others (Specify):	---

7.0	SAFE USAGE DATA	
7.1	Ventilation: General/Mechanical Local Exhaust	Give adequate ventilation during storage. Maintain airflow with exhaust if required.
7.2	Protective Equipment	
7.2.1	Eyes	As found suitable like goggles, masks.
7.2.2	Respiratory	Supply of fresh air through tube masks.
7.2.3	Gloves	Synthetic rubber gloves.
7.2.4	Clothing	Lightweight impervious overalls like cotton apron.
7.2.5	Others	Use adequate headgear.
7.3	Precautions	
7.3.1	Handling & Storage	Storage to be done in a cool, dry and well-ventilated place Keep under lock and key, away from children and pets Do not allow contact with water, acids, other oxidizing agents or any other liquids Keep away from heat, flame & other flammable chemicals Wash hands thoroughly with soap after handling.
		Product to be used by Certified Applicators only, with trained assistants. Open containers in open air do not use sharp tools Do not fumigate alone

7.3.2	Others	<p>Use adequate protective equipment and gas detecting equipments.</p> <p>The area to be fumigated should be airtight do not use in vacuum fumigation.</p> <p>Techniques of aeration and exposure to be adequately adhered</p> <p>Do not allow piling of tablets; do not allow the gas concentration to exceed lower level</p> <p>Proper deactivation process to be followed.</p> <p>Warning placards to be displayed.</p> <p>Entry to the fumigated area to be allowed only after checking gas concentration.</p>
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8.0	EMERGENCY RESPONSE DATA	
8.1	Fire extinguishing media	In case of fire suffocate flames with sand use CO2 extinguishers or use dry chemical extinguishers. DO NOT USE WATER.
8.2	Special Procedures	Engulf fire with sand or dry powder extinguisher.
8.3	Unusual Hazards	Reacts with moisture in air to release toxic phosphine gas.
8.4	Exposure (Inhalation, skin, eye contact, ingestion)	<p>Inhalation: Remove from contaminated area into fresh air. Give oxygen if conscious. CPR if patient has suffered cardiac arrest.</p> <p>Skin: Remove contamination clothing and wash affected area thoroughly with water</p> <p>Eye: Wash eyes thoroughly in eye wash fountain.</p> <p>Ingestion: Induce vomiting if conscious with 1:5000 potassium permanganate. Give 50 gms of activated carbon in water.</p>
8.5	Spills	<p>Do not wash the material in sewer. Use adequate masks & gloves.</p> <p>The material can be collected and left in open air, (far from habitation) keeping it moist until it has hydrolysed fully - this process is called 'Dry Deactivation'.</p> <p>'Wet Deactivation': Deactivating solution is prepared in a drum or a suitable container and the material collected is added slowly. The deactivation solution can be 2% or 4 cups of low sudsing detergent in 30 gallons of water.</p> <p>Partly spent material can also be deactivated in this process. Utmost care to be taken while adding the material. This process should be undertaken in open air, adhering to all the precautionary measures.</p> <p>The deactivated material, dust-water can be disposed off at an approved site.</p> <p>The area of spillage should be thoroughly washed with huge quantity of water and should be aerated. Entry into the area should be allowed only after checking the gas concentration.</p> <p>Phosphine gas, if liberated can be slowly let off in the open air. If huge quantities are let off then it should be ignited by a suitable burner.</p>
8.5.1	Steps to be taken	Refer 8.5 given above
8.5.2	Waste disposal method	Refer 8.5 given above. The used containers should not be kept for re-use. Packaging material should be buried underground or incinerated, at approved sites.
9.0	ADDITIONAL INFORMATION	Evaluation by WHO - Phosphine & Metal Phosphides are toxic. They have a very limited distribution in the Proper standards and procedures in their use prevent harmful effects. No significant global effects on the environment have resulted from the use of phosphine or phosphides.
10.0	SOURCES USED	<p>1) International Chemical Safety Cards (WHO/ICPS/ILO) (ICSC:0472).</p> <p>2) Phosphine & Metal Phosphides - WHO Environmental Criteria 73</p> <p>3) Sax's Dangerous Properties of Industrial Materials.</p>

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