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EPA Pesticide Fact Sheet



SDMS DocID 2087981

Name of Chemical: Lead arsenate
Reason for Issuance: Special review
Date Issued: December 1986
Fact Sheet Number: 112

1. DESCRIPTION OF CHEMICAL

- Common Name: Lead Arsenate
- Chemical Name: Acid Orthoarsenate - $PbHAsO_4$
Basic Orthoarsenate - $Pb_4(PbOH)(AsO_4)_3$
- Trade Name: Lead Arsenate, Gypsine, Security, Talbot
- EPA Shaughnessy Code: Standard (Acid) 013502
Basic 013503
- Chemical Abstracts Service (CAS) Number: 7778-40-9
- Year of Initial Registration:
- Pesticide Type: Growth Regulator, Insecticide, Herbicide, Fungicide
- Chemical Family: Inorganic Arsenicals
- U.S. and Foreign Producers: Mechema Chemicals Ltd.
(Great Britain),

2 USE PATTERNS AND FORMULATIONS

Lead arsenate is currently used as a growth regulator on U.S. grapefruit crop. 10,000 pounds of lead arsenate are applied annually to control cockroaches, silverfish and crickets. They are unaware of any current use as a foliar insecticide or as a herbicide.

- Types and Methods of Application: Airblast sprayer, foliar dust, bait box.
- Application Rates: Growth Regulator - 1.3 lbs arsenic/A;
Insecticide - 1.7 lbs arsenic/A

- Types of Formulations: Dust, flowable liquid, wettable powder, granular, impregnated, wettable powder/dust

3. SCIENCE FINDINGS

Chemical Characteristics

- Lead arsenate is a pentavalent form of inorganic arsenic. It exists as white crystals with no discernible odor. Lead arsenate contains 22% arsenic and is very slightly soluble in cold water. The melting point of lead arsenate is 1042 degrees C, the density and the molecular weight is 347.12. Technical lead arsenate is 95-98% lead arsenate. Under most conditions basic lead arsenate is more stable than acid lead arsenate.

Toxicological Characteristics

- Inorganic arsenical compounds have been classified as Class I carcinogens, demonstrating positive oncogenic effects based on human epidemiological evidence.
- Inorganic arsenicals have been assayed for mutagenic activity in a variety of test systems ranging from bacterial cells to peripheral lymphocytes from humans exposed to arsenic. The weight of evidence indicates that inorganic arsenical compounds are mutagenic.
- Evidence exists indicating that there is teratogenic and fetotoxic potential based on intravenous and intraperitoneal routes; however, evidence by the oral route is insufficient to confirm arsenate's teratogenic and fetotoxic effects.
- Inorganic arsenicals are known to be acutely toxic. The symptoms following oral exposure include severe gastrointestinal damage, vomiting and diarrhea, and general vascular collapse, shock, coma and death. Muscular cramps, facial edema, and vascular reactions are also known to occur following oral arsenic.

Environmental Characteristics

- The environmental fate of lead arsenate is not well documented. Studies to demonstrate its fate must take into account the

inorganic arsenicals are natural constituents of the soil, forms of inorganic arsenic may change depending on environmental conditions. Based on very limited data lead arsenate is not to leach significantly.

Ecological Characteristics

- Lead arsenate is moderately toxic to birds, slightly toxic moderately toxic to aquatic invertebrate species.
- Metabolism: The metabolism of inorganic arsenic compounds in animals is well known. The pentavalent form, such as lead arsenate, is metabolized by reduction into the trivalent form followed by transformation into organic forms which are excreted within several days via the urine. All animals exhibit this metabolism except rats, which retain arsenic in their bodies 90 days.
- Tolerance Assessment: Tolerances were established in 40 CFR for residues of lead arsenate.
- Reported Pesticide Incidents: The Agency's Pesticide Incident Monitoring System (PIMS) has many recorded incidents of acute poisonings from the use of lead arsenate baits. Nine of these incidents involved hospitalizations and 16 involved children from "roach hive" products.

4. SUMMARY OF REGULATORY POSITION AND RATIONALE

The Agency is proposing to cancel all existing nonwood uses of lead arsenate, with the exception of the growth regulator on grapefruit. Measures to mitigate the inhalation risks include masks, respirators, which would be expected to reduce inhalation exposure by 80 and 90 percent, respectively, and restricting certified applicators were considered by the Agency during the Review. The Agency has determined that these protective measures do not reduce risks to an acceptable level in light of the limited benefits. The Agency has further determined that the toxic risks from all nonwood uses of lead arsenate, except the grapefruit use, outweigh the limited benefits. The growth regulator use on grapefruit is being deferred pending further evaluation by the Assessment Forum of the carcinogenic potency of inorganic arsenic from dermal and dietary exposures.

- Benefits Analysis: The economic impact from cancellation

arsenate insecticide baits could range from \$.84 to \$6.7 m actual amount depending on whether the alternative chemical is used by homeowners or professionals. No economic impact is expected as a result of cancellation of the herbicide and foliar insecticide lead arsenate. Viable alternatives are available.



5. CONTACT PERSON

Douglas McKinney
 Special Review Branch, Registration Division
 Office of Pesticide Programs (TS-767C)
 401 M Street, S.W.
 Washington, D.C. 20460
 (703) 557-5488

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