ZINC PHOSPHIDE

general fact sheet

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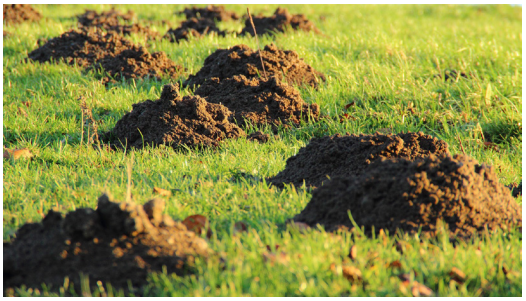
What is zinc phosphide?

Zinc phosphide is an inorganic compound that combines phosphorus with zinc. It is used in rodenticide baits. When an animal eats the bait, the acid in the animal's stomach turns the zinc phosphide into phosphine. Phosphine is a very toxic gas. Phosphine is also released by aluminum phosphide and magnesium phosphide. These are used as fumigants in stored grain.



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Zinc phosphide has been registered for use in pesticide products in the United States since 1947.

What are some products that contain zinc phosphide?

Zinc phosphide is only used as a rodenticide. It is made into bait that will attract the pest, such as gophers, ground squirrels, or field mice. There are over 80 products containing zinc phosphide registered for use in the United States.

IMPORANT: Always ***follow label instructions*** and take steps to ***avoid exposure***. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 800-222-1222. If you wish to discuss a ***pesticide problem***, please call 1-800-858-7378.

How does zinc phosphide work?

When zinc phosphide is eaten by either an animal or a person, stomach acid causes it to release the toxic gas phosphine. Baits containing zinc phosphide are especially dangerous to animals that cannot vomit, such as rats, mice, and rabbits.

The phosphine in the stomach then crosses into the body's cells, and stops the cells from producing energy. This causes the cells to die. Zinc phosphide affects all cells, but targets cells in the heart, lungs, and liver.

How might I be exposed to zinc phosphide?

You can be exposed to a pesticide if you get it on your skin, breathe it in, or if you accidentally eat or drink a product containing a pesticide. This can happen if you get some on your hands and eat or smoke without washing your hands first.

Young children and pets are most likely to be exposed to zinc phosphide by eating the bait pellets if they find them. Baits often have peanut butter, molasses, or other flavors that may attract dogs or children. You may also be exposed if you apply bait with your bare hands, or breathe in any dust or crumbled, powdery bait.

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What are some signs and symptoms from a brief exposure to zinc phosphide?

Some symptoms of exposure to zinc phosphide and phosphine gas include headache, dizziness, vomiting, and difficulty breathing. Liver and kidney failure, convulsions, delirium and coma may also occur if a person is exposed to enough phosphine.

Zinc phosphide affects animals the same way it can affect people. Signs of poisoning in animals include vomiting, anxiety, and retching. The animal may also begin to stagger or lose coordination. These signs can start in less than an hour after exposure if the animal has food in its stomach, or up to 12 hours if the stomach was empty. The vomit of poisoned dogs may contain phosphine.

What happens to zinc phosphide when it enters the body?

In both humans and animals, stomach acid causes the zinc phosphide to release phosphine. If someone inhales zinc phosphide dust, the dust will be cleared from the lungs and then swallowed. Once in the stomach, the dust will be converted to phosphine. Phosphine distributes throughout the body, especially the liver, kidney, and central nervous system. The body can break down the phosphine slowly into less toxic compounds.

Is zinc phosphide likely to contribute to the development of cancer?

Rats fed for two years on grain fumigated with phosphine did not develop cancer more often than rats that did not eat the fumigated grain. Rats that inhaled low concentrations of phosphine for up to 2 years did not show greater levels of cancer. The U.S. EPA has determined that zinc phosphide can't be classified into a cancer category.

Has anyone studied non-cancer effects from long-term exposure to zinc phosphide?

Rats exposed to phosphine gas when they were pregnant gave birth to normal pups if they survived the exposure. No information was found for humans.

No information was found on any relationship between phosphine gas exposure and asthma or other chronic diseases.

Are children more sensitive to zinc phosphide than adults?

There were no studies found showing that children are more sensitive to zinc phosphide than adults. While children may be especially sensitive to pesticides compared to adults, there are currently no data showing that children have increased sensitivity specifically to zinc phosphide. However, small children are more likely to be exposed because they may eat zinc phosphide bait.

What happens to zinc phosphide in the environment?

Zinc phosphide will break down when it is exposed to water or moist soil in the environment. Any phosphine given off will be broken down by air.

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Zinc phosphide pellets may still release phosphine 5 weeks after being placed on damp soils, although the amount released depends on the formulation of the pellets.

Zinc phosphide can break down to phosphoric acid or phosphine in highly acidic conditions.

No information was found on zinc phosphide and groundwater.

Can zinc phosphide affect birds, fish, or other wildlife?

Zinc phosphide is very toxic to birds, fish, and other wildlife if it is eaten. Pellets or grain containing zinc phosphide may attract birds in particular. All baits should be placed so they are out of reach of any pets, children, or non-target wildlife.

Where can I get more information?

For more detailed information about zinc phosphide please visit the list of referenced resources below, call NPIC between 8:00 AM and 12:00 PM Pacific Time (11:00 AM to 3:00 PM Eastern Time), Monday - Friday, at 800-858-7378, or visit us on the web at npic.orst.edu. NPIC provides objective, science-based answers to questions about pesticides.

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