



PUBLIC HEALTH STATEMENT CHLORFENVINPHOS

CAS#: 470-90-6

Division of Toxicology

September 1997

This Public Health Statement is the summary chapter from the Toxicological Profile for Chlorfenvinphos. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFQATM is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This public health statement tells you about chlorfenvinphos and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal clean-up activities. Chlorfenvinphos has been found in at least 1 of the 1,428 current or former NPL sites. However, it's unknown how many NPL sites have been evaluated for this substance. As more sites are evaluated, the sites with chlorfenvinphos may increase. This is important because exposure to this substance may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it by breathing, eating, or drinking the substance or by skin contact.

If you are exposed to chlorfenvinphos, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS CHLORFENVINPHOS?

Chlorfenvinphos is the common name of an organophosphorus insecticide used to control insect pests on livestock. It was also used to control household pests such as flies, fleas, and mites. This chemical is synthetic and does not occur naturally in the environment. Chlorfenvinphos was sold under common trade names including Birlane[®], Dermatone[®], Sapercon[®], Steladone[®], and Supona[®].

The pure chemical (100% chlorfenvinphos) is a colorless liquid with a mild odor. Commercial preparations commonly used in insecticides sold in stores were usually 90% chlorfenvinphos. Most of chlorfenvinphos was used in liquid form. The substance easily mixes with acetone, ethanol, and propylene glycol. It is slowly broken down by water and is corrosive to metal.

1.2 WHAT HAPPENS TO CHLORFENVINPHOS WHEN IT ENTERS THE ENVIRONMENT?

Chlorfenvinphos enters the environment from runoff after rainfall and leaching from hazardous waste sites. After it has leached, it may be present in the soil and underground water (wells). It may be present in surface water (rivers and ponds) after it has run off the land. From soil, it may also be washed into surface waters by rain. It may also

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move from soil to the air by evaporation or by being absorbed by plants. No information is available now to show that it can be found in fish or other freshwater animals, or in seafood, or in plants that are eaten by people.

1.3 HOW MIGHT I BE EXPOSED TO CHLORFENVINPHOS?

Most cases of unintentional chlordfenvinphos poisoning have resulted from short exposures to very high concentrations of this substance. Usually this occurred when people unintentionally swallowed it. Workers involved in pesticide application, or dairy farming, cattle or sheep holding, or poultry production, may have inhaled, swallowed, or contaminated their skin with a large amount of the substance if they did not properly protect themselves when using it. The most common way for people to be exposed to chlordfenvinphos is by eating imported agricultural products contaminated with it and by using pharmaceutical products that contain lanolin. Lanolin is a natural grease from sheep's wool wax that is used as a base for many medications, cosmetic skin lotions, and creams that are rubbed on the skin to keep the skin from drying. Chlordfenvinphos used to control flies in animal buildings and holding pens can contaminate sheep's wool. If you live in areas surrounding hazardous waste disposal sites or treatment facilities for chlordfenvinphos, you could be exposed to it by contact with soils, runoff water, surface water, or groundwater contaminated by spills or leaks on the site or facility. People who work in the disposal of chlordfenvinphos or its wastes are more likely to be exposed. You are most likely to be exposed to chlordfenvinphos if you live near chemical plants where it was manufactured, or near dairy or poultry

farms, or cattle or sheep holding areas where it was used; or if you live near hazardous waste sites that contain it.

1.4 HOW CAN CHLORFENVINPHOS ENTER AND LEAVE MY BODY?

If you breathe air containing chlordfenvinphos, you may absorb it into your body through your lungs. If you eat food or drink water containing this substance, it may be absorbed from your stomach and intestines. Chlordfenvinphos may also enter your body through your skin. Once in the body, it is rapidly broken down and eliminated from the body, mostly when you urinate. It does not build up in your tissues.

1.5 HOW CAN CHLORFENVINPHOS AFFECT MY HEALTH?

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests. One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect the welfare of research animals and scientists must comply with strict animal care guidelines.

Chlordfenvinphos affects the nervous system. In animals and people, high doses of the substance

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produce effects on the nervous system similar to those produced by high doses of muscarine and pure nicotine. Some mild symptoms of exposure are headache, dizziness, weakness, feelings of anxiety, confusion, runny nose, constriction of the pupils of the eye, and inability to see clearly. More severe symptoms may include nausea and vomiting, abdominal cramps, slow pulse, diarrhea, pinpoint pupils, difficulty in breathing, and passing out (fainting). These signs and symptoms may start to develop within 30–60 minutes and reach their maximum effect after 6–8 hours. Very high exposure to chlorfenvinphos has killed people who swallowed it by accident or who swallowed large amounts of the substance to commit suicide. We do not know if people who swallow small quantities of chlorfenvinphos over long periods of time will have permanent damage to their immune systems. In almost all cases, complete recovery occurred when exposure stopped. There is no evidence that long-term exposure to small amounts of the chlorfenvinphos causes any other harmful health effects in people. The substance has not been shown to cause birth defects or to prevent conception in people. The International Agency for Research on Cancer, the Environmental Protection Agency, and the National Toxicology Program have not yet studied chlorfenvinphos for cancer in people and animals. In animal studies, high doses of chlorfenvinphos produced effects on the nervous system similar to those seen in people.

1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO CHLORFENVINPHOS?

Most of the signs and symptoms resulting from chlorfenvinphos poisoning are due to the inhibition of an enzyme called "acetylcholinesterase" in the

nervous system. This enzyme is also found in your red blood cells and a similar enzyme (pseudocholinesterase) is found in blood plasma. The most common test for exposure to many pesticides (including chlorfenvinphos) that contain the element phosphorus is to determine the level of cholinesterase activity in the red blood cells or plasma. This test requires only a small amount of blood and can be done in your doctor's office. It takes weeks for this enzyme to completely recover to normal levels following exposure; therefore, a valid test may be conducted a number of days following the suspected exposure. This test indicates only exposure to a chemical substance of this type. It does not specifically show exposure to chlorfenvinphos. Other chemicals or disease conditions may also alter the activity of this enzyme. There is a wide range of normal cholinesterase activity among individual people in the general population. If your normal or baseline value has not been established through a previous test, you might have to repeat the test several times to determine if your enzyme activity is recovering.

Specific tests are available to identify chlorfenvinphos or its break-down products in your blood, body tissue, and urine. These tests are not usually available through your doctor's office and require special equipment and sample handling. If you need the specific test, your doctor can collect the sample and send it to a special laboratory for analysis. Chlorfenvinphos is rapidly broken down to other chemicals and removed from the body (in urine), so this test must be done in the first few days after exposure to make sure that you have really breathed, swallowed, or got chlorfenvinphos on your skin.

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1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA). Recommendations provide valuable guidelines to protect public health but cannot be enforced by law. Federal organizations that develop recommendations for toxic substances include the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-exceed levels in air, water, soil, or food that are usually based on levels that affect animals, then they are adjusted to help protect people. Sometimes these not-to-exceed levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other reasons.

Recommendations and regulations are also periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it.

The federal government has set standards or guidelines to protect people from the possible harmful health effects of chlorfenvinphos. These include regulated concentration limits for

agricultural products, public right-to-know requirements about production and use of chlorfenvinphos, and regulated quantities requiring emergency response procedures if an accidental release occurred.

1.8 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for chlorfenvinphos. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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