

US EPA ARCHIVE DOCUMENT

Hexachlorocyclohexane, gamma

CAS Number: 58-89-9

What is hexachlorocyclohexane?

Hexachlorocyclohexane, gamma-, also known as HCH gamma- or lindane, is a white solid that turns into a vapor when released into the air. Once released, it looks colorless but has a musty odor. HCH gamma- is a man-made chemical and it exists in eight different forms.

What is hexachlorocyclohexane used for?

HCH gamma- was mostly used on fruit and vegetable crops to kill insects. Today it is used as an ingredient in ointments that help cure head lice, body lice, and scabies. HCH gamma- hasn't been made in the United States since 1977 but it is still brought into the country (imported) and formulated. The U.S. Environmental Protection Agency (EPA) has placed limits on what it can be used for in the United States. Only individuals who are certified can use it.

In your house, it is found in products like house sprays, shelf paper, and dog dips.

How can it enter and leave your body?

HCH gamma- can get into your body when you eat foods that contain the substance. When you breathe contaminated air, HCH gamma- can get into your lungs. When you use HCH gamma- containing products to remove lice and scabies, the substance can enter your body through your skin. Once in your body, the HCH gamma is stored for a short time in body fat. HCH gamma tends to leave the body very quickly through urine. Small amounts leave the body in feces and when you exhale (breathe out).

How can you be exposed to hexachlorocyclohexane?

There are several ways that you can be exposed to HCH gamma-. You can be exposed by eating HCH gamma- contaminated food like plants, meat or dairy products (milk). You could breathe contaminated air if your workplace makes or uses HCH gamma-. It is possible to be exposed by drinking HCH contaminated water or by breathing HCH released from waste sites or landfills. You could be exposed through skin contact if you use soaps, lotions or shampoo containing HCH gamma- that help treat and control head and body lice and scabies. Nursing mothers that have been exposed to HCH gamma- can pass it onto their babies in breast milk.

HCH gamma- has been found in soil and surface water at hazardous waste sites.

What are the health effects of exposure to hexachlorocyclohexane?

Workers exposed to HCH gamma- while making pesticides showed signs of lung irritation, heart disorders, blood disorders, headache, convulsions, and changes in sex hormones. Humans and animals exposed to large amounts of HCH gamma- died.

Reports show that some people who swallowed high doses of HCH gamma- had seizures and some died. Others exposed to very large doses developed blood disorders and had seizures. People who breathed HCH gamma- in the workplace developed blood disorders, experienced dizziness, headaches, and showed changes in the levels of sex hormones.

When animals were fed high doses of HCH gamma-, they had convulsions and went into a coma. Animals exposed to moderate or average doses showed kidney and liver problems (effects) and were also less able to fight off infections.

The Department of Health and Human Services has determined that HCH gamma- may very well be a carcinogen (cancer causing substance). Rats exposed to HCH gamma- showed evidence of liver cancer.

What levels of exposure can result in harmful health effects?

The harmful effects on humans and animals of breathing HCH gamma- over a short period of time (14 days or less) and over a long period of time (more than 14 days) aren't known.

Studies show that food containing the smallest doses of 0.3 parts per million (ppm) of HCH gamma- eaten over a short-term could be harmful to people. Food containing 0.02 ppm of HCH gamma- eaten over 2 - 32 weeks also posed risk. The effects of short- and long-term exposure from drinking water are not known.

Animal studies show that rats exposed to doses between 300 and 1,200 ppm of HCH gamma for 1 - 6 days showed learning problems and experienced seizures.

Rats exposed to 10 - 800 ppm of HCH gamma for 4 - 39 weeks showed increased ovary weight, learning problems, increased kidney weight, kidney damage, decreased red blood cells, coma, and injury to ovaries. Rabbits showed problems with the immune systems ability to fight off infections.

No information on the short- and long-term effects of drinking HCH gamma- are known.

Where can you get more information?

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, N.E., E-29
Atlanta, Georgia 30333

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). *Public Health Statement for Hexachlorocyclohexane*. Atlanta, GA: U.S. Department of Health and Human Services, 1989.
2. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Hexachlorocyclohexane*. Atlanta, GA: U.S. Department of Health and Human Services, 1995.
3. Reigart, Routt J. and Roberts, James R. Medical University of South Carolina. *Recognition and Management of Pesticide Poisonings*. Fifth ed. Washington, D.C.: U.S. Environmental Protection Agency, Office of Pesticide Programs, 1999.