

This fact sheet answers the most frequently asked health questions (FAQs) about 3,3'-dichlorobenzidine. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information 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.

HIGHLIGHTS: Exposure to 3,3'-dichlorobenzidine may cause sore throat, respiratory infections, stomach upset, headache, dizziness, burns, and dermatitis. It has been found to cause tumors in a variety of organs in animals. This substance has been found in at least 32 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is 3,3'-dichlorobenzidine?

(Pronounced 3,3-dī klôr' ə bĕn' zĭ dĕn')

3,3'-Dichlorobenzidine is a gray-to-purple colored crystalline solid. It changes from a solid to a gas very slowly.

3,3'-Dichlorobenzidine salt is the major form in actual use. It is a stable, off-white colored crystalline solid that does not evaporate. Neither 3,3'-dichlorobenzidine nor its salt are found naturally in the environment. They are manufactured for pigments for printing inks, textiles, plastics and enamels, paint, leather, and rubber.

What happens to 3,3'-dichlorobenzidine when it enters the environment?

- 3,3'-Dichlorobenzidine breaks down rapidly when exposed to natural sunlight.
- About half of the chemical breaks down within 10 hours in air and sunlight.
- In water exposed to natural sunlight, it will break down even more rapidly.
- In soil, where no sunlight is present, it may last for several months.

- Under certain conditions, 3,3'-dichlorobenzidine in soil can break down to form another chemical, benzidine.

How might I be exposed to 3,3'-dichlorobenzidine?

- It is used to make pigments to color various substances.
- You may be exposed if you work in a place where it is manufactured or used.
- The most common ways to be exposed are by breathing dust or getting it on your skin.
- You could be exposed through dirt or water if you lived near a plant that uses it, or a hazardous waste site that contains it.

How can 3,3'-dichlorobenzidine affect my health?

The salt form of 3,3'-dichlorobenzidine may have caused sore throat, respiratory infections, stomach upset, headache, dizziness, caustic burns, and dermatitis (an inflammation of the skin) in workers exposed to the chemical. However, with the exception of dermatitis, it is not certain that 3,3'-dichlorobenzidine caused these effects because the workers were exposed to other chemicals at the same time.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

How likely is 3,3'-dichlorobenzidine to cause cancer?

Studies show that 3,3'-dichlorobenzidine caused cancer of the liver, skin, breast, bladder, and tissues that form blood (leukemia) and other organs in laboratory animals that ate it in their food. Studies in people are inconclusive.

The Department of Health and Human Services (DHHS) has determined that 3,3'-dichlorobenzidine and its salt form may reasonably be expected to be a carcinogen.

How can 3,3'-dichlorobenzidine affect children?

There are no studies on the health effects of children exposed to 3,3'-dichlorobenzidine. In studies in which pregnant mice were injected with high amounts of 3,3'-dichlorobenzidine under the skin, the kidneys of their babies did not develop properly and some babies developed kidney tumors. However, it is very unlikely that people will encounter such exposure conditions.

There is some evidence that 3,3'-dichlorobenzidine and its breakdown products can cross the placenta. We do not know if it can be transferred to babies by breast milk.

How can families reduce the risk of exposure to 3,3'-dichlorobenzidine?

Adults who work with 3,3'-dichlorobenzidine should be careful not to bring home contaminated clothing or tools. If you live near a plant that uses 3,3'-dichlorobenzidine or a hazardous waste site that contains it, you and your children should be careful to wash your hands frequently, especially before eating and children should be prevented from putting their dirty hands in their mouths.

Is there a medical test to show whether I've been exposed to 3,3'-dichlorobenzidine?

There are tests that can determine the presence of 3,3'-dichlorobenzidine in your urine. These tests are not commonly available to the general population, but are available to workers who may have been exposed to potentially harmful levels of the chemical in the workplace.

The tests are accurate, but because 3,3'-dichlorobenzidine does not stay in the body for very long, they must be done as soon as possible after exposure.

Has the federal government made recommendations to protect human health?

The EPA requires that spills or accidental releases into the environment of 1 pound or more of 3,3'-dichlorobenzidine be reported to the EPA.

The National Institute for Occupational Safety and Health (NIOSH) considers 3,3'-dichlorobenzidine a "potential occupational carcinogen" and recommends workplace practices and controls to reduce exposures to the lowest possible level.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1998. Toxicological profile for 3,3'-dichlorobenzidine. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

