DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Frequently Asked Questions

2,4- and 2,6-DINITROTOULENE

What are 2,4- and 2,6-DINITROTOLUENE?

Both 2,4-Dinitrotoulene (2,4-DNT) and 2,6-Dinitrotoluene (2,6-DNT) are man-made solids that are pale yellow and have a slight odor. They are two of the six forms of a chemical called Dinitrotoluene (DNT). DNT is made by mixing toluene with nitric acid.

Where can 2,4- and 2,6-Dinitrotoluene be found and how are they used?

Dinitrotoluene can be found in air, surface water, groundwater and soil. It is sent into the air in the form of dusts or aerosols from factories. An aerosol is a small particle suspended in the air. It is unlikely that Dinitrotoluene would go into the air as a vapor from water. It is believed that when the chemicals are exposed to sunlight, Dinitrotoluene breaks down in air through different chemical reactions.

Dinitrotoluene is used to make bedding and furniture foam, ammunition, explosives, dyes and as a propellant in air bags for cars.

How can people be exposed to 2,4- and 2,6-Dinitrotoluene?

You could be exposed to 2,4- and 2,6-Dinitrotoluene through:

Breathing air near waste sites or factories that release Dinitrotoluene. You could also breathe Dinitrotoluene if you work where it is used or made.

Drinking water polluted with Dinitrotoluene. This could happen if you live near a waste site containing Dinitrotoluene. You could also be exposed through ground water that is near a factory where Dinitrotoluene may be released.

Touching soil at a waste site, or touching materials at work that have been in contact with Dinitrotoluene.

Eye Contact by touching the eyes with hands that have been in contact with Dinitrotoluene. You could also splash it, or get vapors into your eyes.

Most people are not likely to be exposed to Dinitrotoluene. There are low levels of Dinitrotoluene in the environment.

How do 2,4- and 2,6-Dinitrotoluene work?

At work, the main way these chemicals enter the body is by breathing or touching it. It may also enter the body by mouth. This could happen if you touch Dinitrotoluene, then eat or smoke without washing your hands. When Dinitrotoluene enters the body, the liver and intestines change it into different substances. Most of these chemicals leave the body in 24 hours through the urine and waste matter.

How can 2,4- and 2,6-Dinitrotoluene affect my health?

Scientists have seen an increased death rate from heart disease in workers exposed to 2,4-Dinitrotoluene or technical grade Dinitrotoluene (Tg-DNT). However, these workers may also have been exposed to other chemicals. 2,4- and 2,6-Dinitrotoluene may affect the nervous system and the blood. One study showed that male workers exposed to 2,4- and 2,6-Dinitrotoluene had reduced levels of sperm but later studies did not confirm the finding.

Exposure to high levels of these compounds in animals causes reproductive problems. These include lower sperm counts and reduced fertility. Animal studies have also shown other effects. These include damage to the nervous system, liver and kidneys. Red blood cell counts can also be reduced. Both 2,4- and 2,6-Dinitrotoluene can cause liver cancer in laboratory rats. It is possible that 2,4- and 2,6-Dinitrotoluene may cause cancer in humans.

How is 2,4- and 2,6-Dinitrotoluene poisoning treated?

There is no treatment just for Dinitrotoluene. Treatment depends on the level of exposure.

What should I do if exposed to 2,4- and 2,6-Dinitrotoluene?

If you breathe Dinitrotoluene, move to fresh air. Get medical help.

If you get Dinitrotoluene on your skin, take off contaminated clothes. Wash with lots of soapy water. Cover the skin with an antibacterial cream. Get medical help.

If you get Dinitrotoluene in your eyes, remove contact lenses if you can do it easily. Wash your eyes with clean water for at least 15 minutes. Get medical help.

What factors limit use or exposure to 2,4- and 2,6-Dinitrotoluene?

If you live near a site that could be polluted with Dinitrotoluene, do not let children put dirt, water or other things in their mouths. Make sure they wash their hands often, especially before eating.

Is there a medical test to show whether I've been exposed to 2,4- and 2,6-Dinitrotoluene?

Tests can show 2,4- and 2,6-Dinitrotoluene in the blood and urine. These tests cannot show the amount of exposure to 2,4- or 2,6-Dinitrotoluene. The urine must be collected within 24 hours of exposure.

Technical information for 2,4- and 2,6- Dinitrotoluene

CAS Number: 2,4-Dinitrotoluene – 121-14-2 2,6-Dinitrotoluene – 606-20-2

Chemical Formula: $C_7H_6N_2O_4$

Carcinogenicity (EPA): The mixture of 2,4- and 2,6-Dinitrotoluene has been identified as a probable human carcinogen. There are no assessments for the compounds separately.

MCL (Drinking Water): There is no MCL for Dinitrotoluene.

OSHA Standards: The PEL standard which is based on an 8-hour day, 40-hour week is 1.5 milligrams per cubic meter of air.

NIOSH Standards: The recommended 10-hour Time Weighted Average is 1.5 milligrams per cubic meter of air.

References and Sources

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