



# PUBLIC HEALTH STATEMENT

## n-NITROSODIPHENYLAMINE

CAS#: 86-30-6

Division of Toxicology

April 1993

This Public Health Statement is the summary chapter from the Toxicological Profile for n-Nitrosodiphenylamine. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, 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 Statement was prepared to give you information about n-nitrosodiphenylamine and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,300 sites on its National Priorities List (NPL). n-Nitrosodiphenylamine has been found in at least 172 of these sites. However, we do not know how many of the 1,300 NPL sites have been evaluated for n-nitrosodiphenylamine. As EPA evaluates more sites, the number of sites at which n-nitrosodiphenylamine is found may change. This information is important for you to know because n-nitrosodiphenylamine may cause harmful health effects and because these sites are potential or actual sources of human exposure to n-nitrosodiphenylamine.

When a chemical 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 as a chemical emission. This emission, which is also called a release, does not always lead to exposure. You can be exposed to a chemical only when you come into contact with the chemical. You may be

exposed to it in the environment by breathing, eating, or drinking substances containing the chemical or from skin contact with it.

If you are exposed to a hazardous chemical such as aldrin or dieldrin, several factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, sex, nutritional status, family traits, lifestyle, and state of health.

### 1.1 WHAT IS n-NITROSODIPHENYLAMINE?

n-Nitrosodiphenylamine is an orange-brown or yellow solid. It evaporates slowly to the air and can attach to dust particles and travel with the wind. It can dissolve in water and attach to soil. It breaks down to other substances, but we do not know whether these substances are harmful to humans. We have not found n-nitrosodiphenylamine in drinking water, foods, or in the air we breathe. However, it is in the water and soil near some hazardous waste sites. We do not know whether n-nitrosodiphenylamine is found in the air near hazardous waste sites or in food grown near such sites.

We do not know if n-nitrosodiphenylamine occurs naturally in the environment, but some scientific evidence suggests that tiny organisms too small to be seen without the aid of a microscope may make it. It can be man-made and is used to make rubber products such as tires. It is sometimes used to make other chemicals. In the early 1980s, most U.S. rubber

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manufacturers replaced it with more efficient chemicals. Only one manufacturer in the United States produces n-nitrosodiphenylamine.

### 1.2 WHAT HAPPENS TO n-NITROSODIPHENYLAMINE WHEN IT ENTERS THE ENVIRONMENT?

n-Nitrosodiphenylamine can enter the environment by evaporating to the air from waste sites. It can also leak into the ground from waste sites and dissolve into the groundwater and surface water. Industrial discharge releases n-nitrosodiphenylamine into water. n-Nitrosodiphenylamine can also bind to soil. In laboratory tests, most n-nitrosodiphenylamine disappears from water and soil within several weeks. Organisms that live in the water take it up to a limited degree. We do not know if land animals or plants take it up. It is believed that the chemical breaks down to other products. We do not know what the breakdown products are or if they are harmful to humans. However, it has not been found in the drinking water, food, or air with which you would normally come in contact.

### 1.3 HOW MIGHT I BE EXPOSED TO n-NITROSODIPHENYLAMINE?

There is no available information to show that n-nitrosodiphenylamine exists in the soil, air, food, or water with which you would normally come in contact. Therefore, you are not likely to be exposed to it.

Workers who were or are involved in the production or use of n-nitrosodiphenylamine may have been exposed to the chemical. Occupational data from 1981 to 1983 show that an estimated 1,093 workers

employed at 137 plants might have been exposed to it. Today, since only one company makes it, fewer workers are exposed. Current exposure may also include contact with n-nitrosodiphenylamine at hazardous waste sites. It has been found in 3.6% of underground water samples and 0.7% of aboveground water samples taken at hazardous waste sites.

### 1.4 HOW CAN n-NITROSODIPHENYLAMINE ENTER AND LEAVE MY BODY?

Substances can generally enter your bloodstream if you breathe them in the air, eat or drink them, or get them on your skin. We do not know if n-nitrosodiphenylamine can enter your body through the lungs. Evidence from animal studies shows that n-nitrosodiphenylamine enters the bloodstream after animals swallow water or food containing it. This information suggests that it is likely to enter your body if you are exposed to it by mouth. Animal studies also suggest that n-nitrosodiphenylamine can enter your body if it gets on your skin. If you live near a hazardous waste site, n-nitrosodiphenylamine could enter your body if you drink water containing it or possibly if you breathe it in the air. Children could also be exposed by eating or touching dirt that has n-nitrosodiphenylamine in it. If you work with n-nitrosodiphenylamine, you could be exposed to it by breathing small particles of it in the air or getting it on your skin. Animals break n-nitrosodiphenylamine down into other substances that can also harm their health. We expect that humans break it down by similar means.

An animal study showed that some n-nitrosodiphenylamine rapidly leaves the body in

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urine. Some probably also leaves the body in feces. It probably leaves the human body in a similar manner. We do not know how long it takes for all n-nitrosodiphenylamine to leave the body.

It is most likely to enter your body if you come into contact with it in air, water, or soil at hazardous waste sites containing it.

#### 1.5 HOW CAN n-NITROSODIPHENYLAMINE AFFECT MY HEALTH?

We do not have enough information to know how n-nitrosodiphenylamine will affect your health.

We know very little about the health effects of exposure to n-nitrosodiphenylamine in animals, except that swallowing large doses can cause death. Animals given n-nitrosodiphenylamine in their diets for long periods developed swelling, cancer of the bladder, and changes in body weight. We do not know whether these effects would occur in humans. We also do not know if it can affect pregnancy or cause birth defects. EPA considers n-nitrosodiphenylamine to be a possible cancer-causing substance in humans because of the health effects seen in some animals. The International Agency for Research on Cancer (IARC) concluded that there are not enough data to determine whether n-nitrosodiphenylamine causes cancer in humans. IARC also concluded that there is limited evidence indicating that n-nitrosodiphenylamine causes cancer in experimental animals.

#### 1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO n-NITROSODIPHENYLAMINE?

There are no tests available to determine if you have

been exposed to n-nitrosodiphenylamine. There are tests to detect n-nitrosodiphenylamine and its breakdown products in the blood and urine of exposed animals, but these tests have not been used for people.

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

The federal government has taken steps to protect you from n-nitrosodiphenylamine. If amounts over 100 pounds are released to the environment, the National Response Center of the federal government must be told immediately. According to EPA, the amount of n-nitrosodiphenylamine in water (lakes, rivers, etc.) should be limited to 49,000 nanograms (one billionth of a gram) per liter of water or less. At these amounts, EPA estimates that your risk of getting cancer is very low. The amount in drinking water should be 700 micrograms (one millionth of a gram) per liter or less.

#### 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

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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). 1993. Toxicological profile for n-nitrosodiphenylamine. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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**[www.atsdr.cdc.gov/](http://www.atsdr.cdc.gov/)**

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