

This fact sheet answers the most frequently asked health questions (FAQs) about *n*-nitrosodiphenylamine. 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. 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.

**SUMMARY:** The general population and people in the workplace are probably not exposed to *n*-nitrosodiphenylamine. People living near hazardous waste sites may, however, be exposed to it by drinking contaminated water or by touching or breathing contaminated soil and dust. Limited animal studies suggest that *n*-nitrosodiphenylamine can damage the bladder and kidneys. It has been found in at least 172 of 1,300 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What is *n*-nitrosodiphenylamine?

(Pronounced n-nī trō'-sō di-fē'nūl ăm'ēn)

*n*-Nitrosodiphenylamine is an industrial compound. It is an orange-brown or yellow solid that has been produced since 1945. *n*-nitrosodiphenylamine is used to make rubber products such as tires or to make other chemicals.

In the early 1980s, most U.S. rubber manufacturers replaced it with more efficient chemicals. Today, only one manufacturer in the United States produces *n*-nitrosodiphenylamine.

We do not know if it occurs naturally in the environment. There is some evidence that microorganisms make it.

### What happens to *n*-nitrosodiphenylamine when it enters the environment?

- It evaporates slowly to the air or leaks into the ground from waste sites.
- In air, *n*-nitrosodiphenylamine attaches to dust particles and can move with the wind.

- It dissolves in water, but it binds to soil and does not move quickly through soil.
- It breaks down in air, water, and soil within several weeks.
- We don't know what the breakdown substances are in humans or whether they are harmful to you.
- We don't find it in our normal drinking water, foods, or air.
- Water organisms take some into their bodies, but they don't appear to build up high levels.
- We don't know if land animals or plants take it up and store it in their bodies.

### How might I be exposed to *n*-nitrosodiphenylamine?

- The likelihood of exposure is very low.
- Exposure in the workplace is not likely (only one company makes it today).
- Drinking water near hazardous waste sites may be contaminated.
- Touching or breathing contaminated waste or soils near hazardous waste sites may result in higher exposures.

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

### How can *n*-nitrosodiphenylamine affect my health?

There is very little information on the effects of *n*-nitrosodiphenylamine on human health. There is also not enough information from animal studies to estimate how exposure to it will affect your health.

Animal studies have identified levels and exposures that can cause death. Animals given high levels of *n*-nitrosodiphenylamine in their diets for long periods of time developed swelling, cancer of the bladder, and changes in body weight.

We don't know if these effects would occur in humans. We also don't know if it can affect pregnancy or cause birth defects.

### How likely is *n*-nitrosodiphenylamine to cause cancer?

The EPA has determined that *n*-nitrosodiphenylamine is a probable human carcinogen. This is based on a long-term study in rats showing an increase in bladder cancer in the group exposed to high levels of *n*-nitrosodiphenylamine. There is no evidence that it causes bladder cancer in people.

Although EPA has classified *n*-nitrosodiphenylamine as a probable carcinogen, the animal data are limited. Other public health agencies have concluded that no evaluation of *n*-nitrosodiphenylamine's carcinogenicity in people is currently possible. Additional research is needed.

### Is there a medical test to show whether I've been exposed to *n*-nitrosodiphenylamine?

No tests are 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.

### Has the federal government made recommendations to protect human health?

The EPA recommends limits on how much *n*-nitrosodiphenylamine can be present in bodies of water such as lakes and rivers. The recommended levels are 49,000 nanograms or less of *n*-nitrosodiphenylamine per liter of water (49,000 ng/L). At this level, EPA estimates that your risk of getting cancer is very low.

For drinking water, the EPA set a limit of 700 micrograms or less of *n*-nitrosodiphenylamine per liter of drinking water (700 µg/L).

*n*-Nitrosodiphenylamine is also considered to be a hazardous waste, and the EPA requires industry to immediately report a spill of more than 100 pounds to the National Response Center of the federal government.

### Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Ingestion: Taking food or drink into your body.

Microgram (µg): One millionth of a gram.

Nanogram (ng): One billionth of a gram.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for *n*-nitrosodiphenylamine. Atlanta: 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.

