

Sources of Exposure

Toxicokinetics and Normal Human Levels

Biomarkers/Environmental Levels

General Populations

- The general population is not likely to be exposed to 1,2-diphenylhydrazine because dye manufacturers in the United States no longer produce benzidine-based dyes, which was the former principal use of 1,2-diphenylhydrazine.
- The populations living near hazardous waste sites where 1,2-diphenylhydrazine is present may be exposed to potentially high levels. However, this is not likely because 1,2-diphenylhydrazine decomposes rapidly.

Occupational Populations

- 1,2-Diphenylhydrazine is used to produce a veterinary medication (phenylbutazone). There is potential for workers involved in the manufacturing of this drug to be exposed to 1,2-diphenylhydrazine.

Toxicokinetics

- 1,2-Diphenylhydrazine is presumed to be absorbed following oral exposure based on the appearance of urinary metabolites and adverse health effects, although there are no data on percent absorbed.
- No information on the distribution of 1,2-diphenylhydrazine was identified.
- The available data suggest that 1,2-diphenylhydrazine is metabolized to aniline in the gut and that it readily forms benzidine in the acidic stomach.
- No information is available on the excretion of 1,2-diphenylhydrazine; one study reported the presence of unidentified urinary metabolites.

Normal Human Levels

- There is no information on background levels of 1,2-diphenylhydrazine in human.

Biomarkers

- There are no studies located regarding biomarkers of exposure or effects for 1,2-diphenylhydrazine.

Environmental Levels

Air

- No ambient air monitoring data are available for 1,2-diphenylhydrazine.

Water

- No recent water monitoring samples are available for 1,2-diphenylhydrazine.

Sediment and Soil

- 1,2-Diphenylhydrazine has been identified in soil only at hazardous waste sites.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2020. Toxicological Profile for 1,2-Diphenylhydrazine. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

ToxGuide™ for 1,2- Diphenylhydrazine



(CAS # 122-66-7)

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U.S. Department of Health and
Human Services
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Agency for Toxic Substances
and Disease Registry
www.atsdr.cdc.gov



Chemical and Physical Information

Routes of Exposure

Relevance to Public Health (Health Effects)

1,2-Diphenylhydrazine is a Manufactured Substance

- 1,2-Diphenylhydrazine can rapidly oxidize to azobenzene under some environmental conditions.
- 1,2-Diphenylhydrazine has a half-life in water as short as 15 minutes. It is also rapidly oxidized in air and soil.
- The only current use of 1,2-diphenylhydrazine in the United States is in the production of a veterinary anti-inflammatory pharmaceutical agents.

- Inhalation – Not a likely route of exposure for general population.
- Oral – Potential exposure route of concern for general population.
- Dermal – Not a likely route of exposure.

1,2-Diphenylhydrazine in the Environment

- The fate, transport, and distribution of 1,2-diphenylhydrazine in the environment are influenced by its rapid oxidation to azobenzene.
- Because it is rapidly oxidized, it is not likely to persist in water or leach from soil to underlying groundwater.
- 1,2-Diphenylhydrazine is not likely to bioconcentrate in aquatic organisms.

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

Minimal Risk Levels (MRLs)

Inhalation

- No acute-, intermediate-, or chronic-duration inhalation MRLs were derived for 1,2-diphenylhydrazine.

Oral

- No acute-duration oral MRL was derived for 1,2-diphenylhydrazine.
- An intermediate-duration (15–364 days) oral MRL of 0.05 mg/kg/day was derived for 1,2-diphenylhydrazine.
- No chronic-duration oral MRL was derived for 1,2-diphenylhydrazine.

Health Effects

- There is limited information on the health effects of 1,2-diphenylhydrazine.
- No epidemiology or human exposure studies are available, and toxicity data are limited to a few oral studies in laboratory animals.
- Hepatic effects have been observed in rats and mice following intermediate or chronic oral exposure. Effects included hypertrophy, fatty metamorphosis, and coagulative necrosis.
- Gastrointestinal (intestinal hemorrhage and stomach hyperkeratosis) and respiratory (interstitial inflammation of the lungs) effects have also been observed in animals.
- Liver mammary gland and Zymbal gland/ear canal tumors have been observed in rats.
- The Department of Health and Human Services (HHS) determined that 1,2-diphenylhydrazine is reasonably anticipated to be a human carcinogen. The Environmental Protection Agency (EPA) determined that 1,2-diphenylhydrazine is a probable human carcinogen.

Children's Health

- It is not known if children are more sensitive to 1,2-diphenylhydrazine exposure than adults