

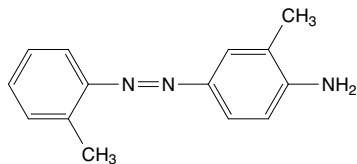
## *o*-Aminoazotoluene

### CAS No. 97-56-3

Reasonably anticipated to be a human carcinogen

First listed in the *Fifth Annual Report on Carcinogens* (1989)

Also known as C.I. solvent yellow 3 or fast garnet GBC base



### Carcinogenicity

*o*-Aminoazotoluene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity from studies in experimental animals.

#### Cancer Studies in Experimental Animals

*o*-Aminoazotoluene caused tumors in several species of experimental animals, at several different tissue sites, and by several different routes of exposure. Dietary administration of *o*-aminoazotoluene caused benign and/or malignant liver tumors in mice of both sexes (hepatocellular adenoma or carcinoma), male rats (adenoma, hepatocellular carcinoma, cholangioma, or other carcinoma), hamsters of both sexes (hepatocellular adenoma or carcinoma), and dogs of unspecified sex (hepatocellular adenoma or carcinoma, adenocarcinoma, or cholangioma). In mice of both sexes, it also caused lung tumors and benign blood-vessel tumors (hemangi endothelioma in the lung). In addition, urinary-bladder cancer was observed in hamsters of both sexes (papillary or transitional-cell carcinoma) and in dogs of unspecified sex (carcinoma); gallbladder tumors in female hamsters (papilloma or carcinoma) and in dogs of unspecified sex (adenocarcinoma); and mammary-gland cancer (adenocarcinoma) in female hamsters (IARC 1975).

Dermal exposure to *o*-aminoazotoluene caused liver tumors in mice of unspecified sex. Administration of *o*-aminoazotoluene by subcutaneous or intramuscular injection caused hepatocellular liver tumors in female mice, rats of unspecified sex, and newborn mice of both sexes (following a single subcutaneous injection). Also observed were lung tumors in adult and newborn mice of both sexes and cancer at the injection site (fibrosarcoma) in female mice. Administration of *o*-aminoazotoluene by intraperitoneal injection caused hepatocellular liver tumors in mice of both sexes. Benign urinary-bladder tumors (papilloma) following intravesicular instillation in mice and intravesicular implantation in rabbits may also have been exposure-related.

#### Cancer Studies in Humans

No epidemiological studies were identified that evaluated the relationship between human cancer and exposure specifically to *o*-aminoazotoluene.

### Properties

*o*-Aminoazotoluene is an azo dye that exists at room temperature as odorless reddish-brown to golden crystals or an orange powder. It is practically insoluble in water and soluble in alcohol, ether, chloroform, oils, fats, acetone, cellosolve, and toluene. It remains stable under normal temperatures and pressures (IARC 1975, Akron 2009). Physical and chemical properties of *o*-aminoazotoluene are listed in the following table.

Property	Information
Molecular weight	225.3 <sup>a</sup>
Density	1.21 g/cm <sup>3b</sup>
Melting point	101°C to 102°C <sup>a</sup>
Log <i>K</i> <sub>ow</sub>	3.92 <sup>a</sup>
Water solubility	7.64 mg/L at 25°C <sup>a</sup>
Vapor pressure	7.5 × 10 <sup>-7</sup> mm Hg at 25°C <sup>a</sup>

Sources: <sup>a</sup>HSDB 2009, <sup>b</sup>Akron 2009.

### Use

*o*-Aminoazotoluene is used to color oils, fats, and waxes (IARC 1975). It is also used as a chemical intermediate for the production of the dyes C.I. solvent red 24 and C.I. acid red 115 (HSDB 2009).

### Production

Large-scale production of *o*-aminoazotoluene in the United States began in 1914 (IARC 1975). Solvent yellow 3 was manufactured by one U.S. plant in 1979; however, no quantities were reported. In 2009, *o*-aminoazotoluene was produced by one manufacturer in Mexico (SRI 2009) and was available from 19 suppliers worldwide, including 14 U.S. suppliers (ChemSources 2009). No data on U.S. imports or exports of *o*-aminoazotoluene were found.

### Exposure

The primary routes of potential human exposure to *o*-aminoazotoluene are dermal contact and inhalation. *o*-Aminoazotoluene is not used directly in foods, drugs, or cosmetics (IARC 1975). The U.S. Environmental Protection Agency's Toxics Release Inventory reported environmental releases of *o*-aminoazotoluene to air in 1988 (250 lb) and 1991 (5 lb) and to surface water in 1990 (5 lb) (TRI 2009). Occupational exposure may occur through inhalation of dust or by dermal contact during production, formulation, or use of *o*-aminoazotoluene (HSDB 2009). The National Occupational Exposure Survey (conducted from 1981 to 1983) estimated that 1,449 workers potentially were exposed to *o*-aminoazotoluene (in the Chemicals and Allied Products and the Transportation Equipment industries); none of these workers were women (NIOSH 1990).

### Regulations

#### Environmental Protection Agency (EPA)

*Emergency Planning and Community Right-To-Know Act Toxics Release Inventory*: Listed substance subject to reporting requirements.

### References

- Akron. 2009. *The Chemical Database*. The Department of Chemistry at the University of Akron. Last updated: 2/09. <http://ull.chemistry.uakron.edu/erd> and search on CAS number. Last accessed: 4/29/09.
- ChemSources. 2009. *Chem Sources - Chemical Search*. Chemical Sources International. <http://www.chemsources.com/chemonline.html> and search on aminoazotoluene. Last accessed: 4/29/09.
- HSDB. 2009. *Hazardous Substances Data Bank*. National Library of Medicine. <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB> and search on CAS number. Last accessed: 4/29/09.
- IARC. 1975. *Some Aromatic Azo Compounds*, IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, vol. 8. Lyon, France: International Agency for Research on Cancer. 357 pp.
- NIOSH. 1990. *National Occupational Exposure Survey (1981-83)*. National Institute for Occupational Safety and Health. Last updated: 7/1/90. <http://www.cdc.gov/noes/noes1/m1409sic.html>.
- SRI. 2009. *Directory of Chemical Producers*. Menlo Park, CA: SRI Consulting. Database edition. Last accessed: 4/29/09.
- TRI. 2009. *TRI Explorer Chemical Report*. U.S. Environmental Protection Agency. <http://www.epa.gov/triexplorer> and select C.I. Solvent Yellow 3. Last accessed: 7/27/05.