

C.I. Disperse Yellow 3

C.I. Disperse Yellow 3 is a monoazo textile dye used to color nylon, polyvinyl chloride and acrylic fibers, wools and furs, cellulose acetate, polystyrene, and other thermoplastics. The chemical has been detected in wastewater from carpet dyeing plants in the U.S. Exposure may occur to workers in these industries and to the general public through, for example, use of the dye in clothing, hosiery, and carpets.

C.I. Disperse Yellow 3 passed the animal data screen, underwent a preliminary toxicological evaluation, and is being brought to the Carcinogen Identification Committee for consultation. This is a compilation of the relevant studies identified during the preliminary toxicological evaluation.

Epidemiological data

No cancer epidemiology studies were identified.

Animal carcinogenicity data

- 103-week feed studies in mice
 - Male and female B6C3F₁ mice: NTP (1982)
 - *Increases in alveolar/bronchiolar adenoma and carcinoma combined (by trend), and alveolar/bronchiolar adenoma (by pairwise comparison and trend) in males*
 - *Increases in malignant lymphoma (by pairwise comparison and trend), hepatocellular adenoma and carcinoma combined (by pairwise comparison and trend), and hepatocellular adenoma (by pairwise and trend) in females*
- 103-week feed studies in rats
 - Male and female F344/N rats: NTP (1982)
 - *Increases in rare stomach tumors, hepatocellular adenoma and carcinoma combined (by pairwise comparison and trend), and hepatocellular adenoma (by pairwise comparison and trend) in males*
 - *No treatment-related tumor findings in females*

Other relevant data

- Genotoxicity
 - Individual test compilations and evaluation by CCRIS (2009), and as reviewed in IARC (1990)
 - *Mutagenicity assays in *Salmonella typhimurium* (positive and negative)*

- Sister chromatid exchange in Chinese hamster ovary (CHO) cells (*positive*)
 - Chromosomal aberration in CHO cells (*negative*)
 - Mouse lymphoma assay (*positive and negative*)
 - Unscheduled DNA synthesis in primary cultures of rat hepatocytes (*positive*)
- Structure activity considerations
 - C.I. Disperse Yellow 3 is an azo dye, and like many azo dyes, may undergo metabolic reduction to aromatic amines that may be carcinogenic (NTP, 1982)
 - The level of carcinogenicity concern for C.I. Disperse Yellow 3 is rated 'moderate' by the U.S. EPA OncoLogic software, available at: <http://www.epa.gov/oppt/sf/pubs/oncologic.htm>
 - Azo dyes classified by Proposition 65 as carcinogens include:
 - *p*-Aminoazobenzene [Solvent Yellow 1]
 - *o*-Aminoazotoluene [Solvent Yellow 3]
 - 4-Dimethylaminoazobenzene [Solvent Yellow 2]
 - D&C Orange No. 17 [Pigment Orange 5]
 - Oil Orange SS [Solvent Orange 2]
 - Citris Red No. 2 [Solvent Red 80]
 - D&C Red No. 8 [Pigment Red 53]
 - Ponceau MX [Acid Red 26]
 - Ponceau 3R [Acid Dye]
 - Direct Brown 95 (technical grade)
 - Direct Black 38 (technical grade)

Review

- IARC (1990)

References¹

Chemical Carcinogenesis Research Information System (CCRIS, 2009)
<http://toxnet.nlm.nih.gov> (accessed on January 4, 2010).

International Agency for Research on Cancer (IARC, 1990). *IARC Monographs on the evaluation of carcinogenic risks to humans. Some Flame Retardants and Textile Chemicals, and Exposures in the Textile Manufacturing Industry*, Volume 48. IARC, Lyon, pp. 149-159.

National Toxicology Program (NTP, 1982). NTP Technical Report on the Carcinogenesis Bioassay of C.I. Disperse Yellow 3 (CAS No. 2832-40-8) in

¹ Excerpts or the complete publication have been provided to members of the Carcinogen Identification Committee, in the order in which they are discussed in this document.

F344/N rats and B6C3F₁ mice (Feed Study). TR-222, NTP-81-80, NIH
Publication No. 82-1778.