o-Anisidine (2-Methoyaniline)

90-04-0

Hazard Summary

o-Anisidine is used in the manufacture of dyes. Workers in the dye industry may be occupationally exposed to it. Acute (short-term) exposure to o-anisidine results in skin irritation in humans. Workers exposed to o-anisidine by inhalation for 6 months developed headaches, vertigo, and effects on the blood. Animal studies have reported effects on the blood from chronic (long-term) dermal exposure to o-anisidine. No information is available on the reproductive, developmental, or carcinogenic effects of o-anisidine in humans. Animal studies have reported tumors of the urinary bladder from oral exposure to o-anisidine. EPA has not classified o-anisidine for carcinogenicity. The International Agency for Research on Cancer (IARC) has classified o-anisidine as a Group 2B, possible human carcinogen.

Please Note: The main source of information for this fact sheet is the IARC monographs on chemicals carcinogenic to humans (1). Other secondary sources include the Hazardous Substances Data Bank (HSDB) (2), a database of summaries of peer-reviewed literature, and the Registry of Toxic Effects of Chemical Substances (RTECS) (3), a database of toxic effects that are not peer reviewed.

Uses

- o-Anisidine is used as an intermediate in the manufacture of dyes. (1)

Sources and Potential Exposure

- Occupational exposure to o-anisidine may occur for workers in the dye industry. (1)
- o-Anisidine has been identified in tobacco smoke. (1)

Assessing Personal Exposure

- No information is available on the assessment of personal exposure to o-anisidine.

Health Hazard Information

Acute Effects:

- Acute exposure to o-anisidine in humans results in skin irritation. (2)
- Tests involving acute exposure of rats and mice have shown o-anisidine to have moderate acute toxicity from oral exposure. (3)

Chronic Effects (Noncancer):

- Workers exposed to o-anisidine by inhalation for 6 months developed headaches, vertigo, and effects on the blood (increased sulfhemoglobin and methemoglobin). (2)
- Animal studies have reported effects on the blood (anemia and reticulocytosis) from chronic dermal exposure too-anisidine. (2)
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for o-anisidine. (4)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of o-anisidine in humans or animals.

Cancer Risk:

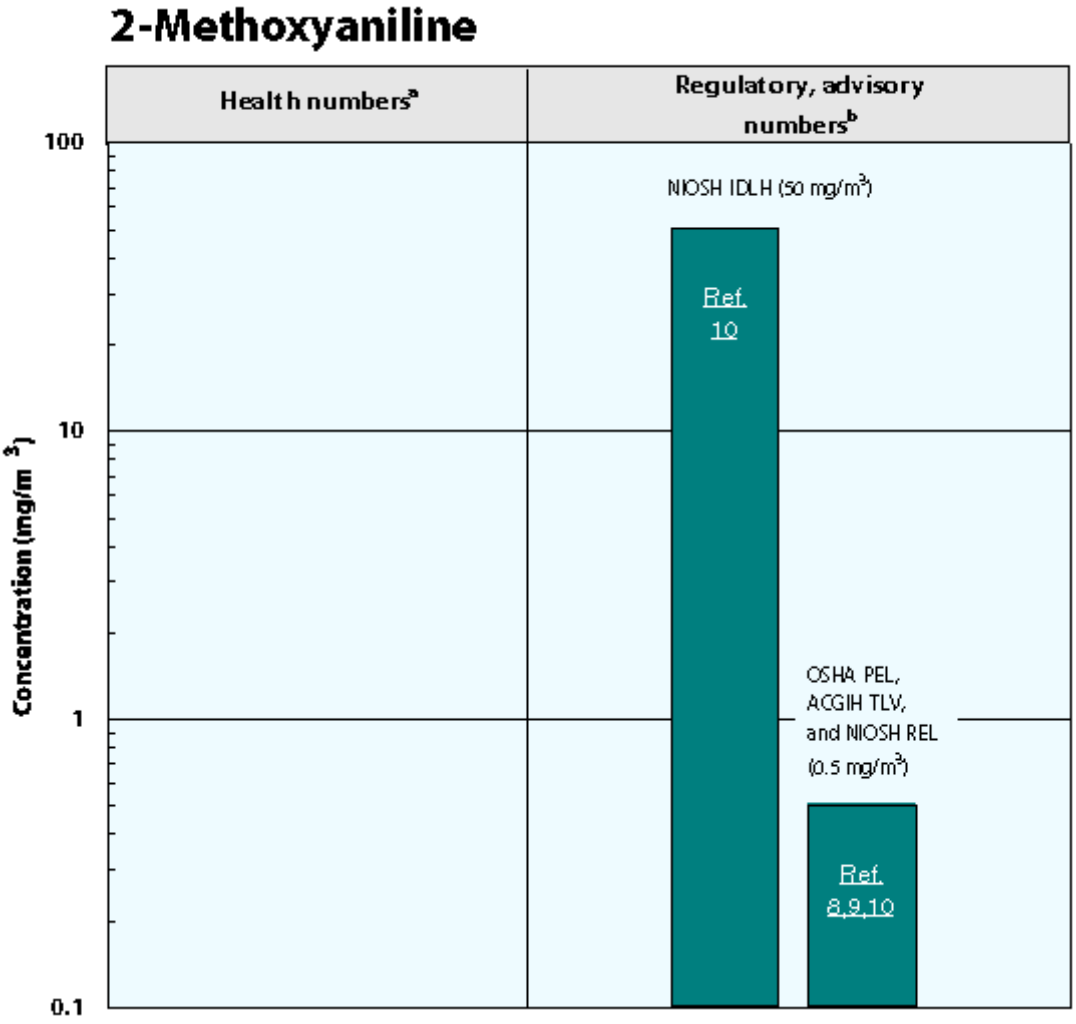
- No information is available on the carcinogenic effects of o-anisidine in humans.
- A National Cancer Institute (NCI) study reported that oral exposure to 2-methoxyaniline hydrochloride (a salt ofo-anisidine) resulted in tumors of the urinary bladder in male and female rats and mice, in the pelvis of the kidney in male rats, and in the thyroid of male rats. (1,2,7)
- EPA has not classified o-anisidine for carcinogenicity.
- IARC has classified o-anisidine as a Group 2B, possible human carcinogen. (5)

Physical Properties

- A common synonym for o-anisidine is ortho-anisidine. (1)
- o-Anisidine is a yellowish-liquid that is slightly soluble in water. (1)
- The chemical formula for o-anisidine is C_7H_9NO, and the molecular weight is 123.2 g/mol. (1)
- The vapor pressure for o-anisidine is 0.212 mm Hg at 20 ℃, and it has a log octanol/water partition coefficient (log K_{ow}) of 1.02. (6)

Conversion Factors:
To convert concentrations in air (at 25 ℃) from ppm to mg/m^3: mg/m^3 = (ppm) × (molecular weight of the compound)/(24.45). For o-anisidine: 1 ppm = 5.04 mg/m^3.

Health Data from Inhalation Exposure



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.
NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.
NIOSH IDLH -- NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.
OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.
[a] Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.
[b] Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

Summary created in April 1992, updated in January 2000.

References

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