Bureau of
Environmental Health
Health Assessment Section
"To protect and improve the health of all Ohioans"

Benzaldehyde

Answers to Frequently Asked Health Questions

What is benzaldehyde?

Benzaldehyde is a colorless, aromatic liquid that has a pleasant almond-like odor. It quickly evaporates (turns from a liquid to a gas) upon exposure to the air.

How is benzaldehyde used?

Benzaldehyde is mainly used as a food and flavoring additive and can be found in many foods, including baked goods, frozen dairy, fruit juice, soft candy, gelatin pudding, non-alcoholic beverages, alcoholic beverages, hard candy, and chewing gum [Fenaroli, 2005].




Benzaldehyde is also used in dyes, fragrances (perfumes, deodorants, etc.), pharmaceuticals (drugs), personal care items (shave gels, moisturizing gels/creams, bath soaps, etc.), as artificial flavoring (cherry and almond flavors), and as an additive for one or more types of tobacco products. It is also used as a solvent for oils, resins, and cellulose fibers.



Where do you find benzaldehyde in the environment?

Everywhere. Benzaldehyde is naturally found in almonds, apples, peaches, cherry and apricot kernels, and other *Prunus* species (fruits that have pits). Benzaldehyde can also be naturally found in essential oils including hyacinth, citronella, orris, cinnamon, sassafras, labdanum ("rock rose") and patchouli (type of mint) [Fenaroli, 2005]. Benzaldehyde has also been found in melon, grapes, tea and whisky [Leffingwell, 1998]. Benzaldehyde can also be found in combustion by-products in car and truck exhaust, wood fires and tobacco smoke.

A Swedish study of indoor dust detected benzaldehyde in 373 out of 389 homes. This suggests that the occurrence in the home would reflect its widespread use in household products. (Nilsson et al, 2005).



What happens to benzaldehyde in the environment?

Benzaldehyde is not a persistent chemical, meaning it does not stay long in the environment. If released to the atmosphere, benzaldehyde is broken down quickly by the air and sunlight and has a half-life of about 30 hours. Benzaldehyde can be carried as dust particles in the air and can be removed by rain and fallout. If released to soil or water, it is expected to biodegrade [Hazardous Substance Data Bank – HSDB].

How does benzaldehyde affect your health?

Benzaldehyde is considered to be a Generally Regarded As Safe (GRAS) food additive in the United States by the FDA and is accepted as a flavoring substance in the European Union. The Environmental Working Group (EWG), Skin Deep Cosmetic Database lists benzaldehyde overall chemical hazard on the low end of the hazard scale.

What happens to benzaldehyde in your body?

Benzaldehyde can be absorbed through skin and/or lungs and is then distributed to high blood flow organs. After being metabolized to benzoic acid, it is naturally removed in the urine. It does not bio-accumulate (build up) in any specific tissue type and there was little acute (immediate) toxicity seen in laboratory studies.

Health effects:

Carcinogenicity and Mutagenicity

Benzaldehyde was evaluated by the National Toxicology Program (NTP), which found no evidence of carcinogenicity in rats, and some evidence of tumorigenicity in mice (non-malignant, benign tumors – or non-cancerous tumors). NTP does not list benzaldehyde as either a *Known* or *Reasonably Anticipated* human carcinogen (Report on Carcinogens, Twelfth Edition 2011).

Dermal Toxicity

Based on the examination of the available laboratory data and a detailed consideration of the chemistry involved in dermal reactions, Patlewicz *et al.,* (2001) concluded that benzaldehyde was not a skin-sensitizer.

Reproductive and Developmental Toxicity

In assessing the teratogenic (causing malformations of an embryo or fetus) potential of benzaldehyde, the Joint FAO/WHO Expert Committee on Food Additives (JECFA) concluded, "…the data reviewed were sufficient to demonstrate a lack of teratogenic and reproductive potential" [JECFA, 2002]

Has the government made recommendations to protect human health?

The Agency for Toxic Substances and Disease Registry (ATSDR) comparison values (CVs) for benzaldehyde in residential soils are 5,000 part per million (ppm) for a child and 70,000 ppm for an adult. These are levels a person can be exposed to without negative health effects.

The U.S. EPA Regional Screening Level (RSL) for benzaldehyde is 7,800 ppm for residential soils and 100,000 ppm for industrial soils.

References

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National Library of Medicine TOXNET Hazardous Substances Data Bank (HSDB) http://toxnet.nlm.nih.gov/

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Nilsson et al., Environment International 31 (2005) 1141 – 1148

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Where can I get more information?

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