Pyridine

Evaluation of the carcinogenicity and genotoxicity

No. 2023/13, The Hague, August 29, 2023

Executive summary

Health Council of the Netherlands

The Health Council of the Netherlands assessed whether exposure to pyridine may induce genotoxic effects and may cause cancer.
The assessment is performed by the Subcommittee on Classifying carcinogenic substances of the Dutch Expert Committee on Occupational Safety of the Health Council.
On the website www.gezondheidsraad.nl, more information can be found on the tasks of this Committee. The composition of the Committee can be found on the last page of this assessment.

About pyridine

Pyridine is used as a chemical intermediate in the production of amongst others pesticides, pharmaceuticals, textile water repellents, and flavours. Moreover, pyridine is amongst others used as a solvent for the production of paint, rubber, and resins.

Assessment of genotoxicity and carcinogenicity

Based on the available scientific literature, the Committee assesses the potential genotoxic and carcinogenic properties of the substance in question. If there are indications for such properties, it recommends classifying the substance in two hazard categories, which represent the weight of evidence that the substance is mutagenic in germ cells (a measure for genotoxicity), and that the substance is carcinogenic. The categories are based on the globally harmonized system criteria for assessing hazard categories, which are also used by the European Commission (EU-guideline (EG) 1272/2008).
The recommendation can be used by the Minister to decide whether the substance should be listed as mutagenic in germ cells and/or carcinogenic.

Evaluation of the data

Most in vitro genotoxicity tests were negative. The only in vitro chromosome aberration test in human lymphocytes was positive; a second chromosome aberration test in CHO cells was negative. No mutagenicity was observed in in vivo studies. The exposure, however, was considered too low in most studies, which could have resulted in the lack of mutagenic effects.
No experiments addressing germ cell mutagenicity have been conducted.
The Committee considers the results of the in vitro and in vivo tests insufficient to classify pyridine for mutagenicity.

There are no reliable data available on the carcinogenicity of pyridine in humans available.

There are data available on tumour development in both rats and mice after exposure to pyridine. A dose-dependent increase in the number of malignant liver tumours has been found in mice. A US National Toxicology Program (NTP) study in male rats reports a dose-dependent increase in kidney tumours, among which only a single malignant tumor that appeared in the low-dose group. This study also detected cases of

leukemia in female rats, but it is unclear whether they were caused by pyridine exposure.

The Committee considers these observations in rats as insufficient evidence for an increased incidence of carcinomas in a second animal species, and therefore proposes to classify pyridine as a substance suspected to be carcinogenic to humans.

Recommendation

The Committee recommends

- not to classify pyridine as a germ cell mutagen;
- to classify pyridine as *suspected to be carcinogenic to humans*, which corresponds with category 2 for carcinogenicity, and to label pyridine with H351 (suspected of causing cancer).

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The Health Council receives most requests for advice from the Ministers of Health, Welfare and Sport, Infrastructure and Water Management, Social Affairs and Employment, and Agriculture, Nature and Food Quality. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.
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Preferred citation:
Health Council of the Netherlands. Pyridine.
The Hague: Health Council of the Netherlands, 2023; publication no. 2023/13.

Health Council of the Netherlands | No. 2023/13