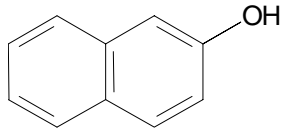


SIDS INITIAL ASSESSMENT PROFILE

CAS No.	135-19-3
Chemical Name	2-Naphthol
Structural Formula	

SUMMARY CONCLUSIONS OF THE SIAR**Human Health**

2-Naphthol can be absorbed through the skin. Rapid conjugation with glucuronide and sulphate in the liver and renal excretion of the unchanged and conjugated forms seems to be the principal mechanism of elimination. The acute oral LD₅₀ in rats was determined as 1320 mg/kg bw in a study following OECD TG 401. Clinical signs included reduced activity, accelerated breathing, closure of eyes, nasal discharge and diarrhoea, and at exposure levels near to or exceeding the LD₅₀ also tumbling, reduced reflexes and seizures.

The inhalation 4-hour-LC₅₀ in rats was determined as 2200 mg/m³ (aerosol; OECD TG 403). Clinical signs included irregular breathing, reduced activity, impaired motility and reflexes, nasal discharge, corneal opacity and diarrhea.

2-Naphthol was not irritating to the skin of rabbits in a test performed according to OECD TG 404, but caused serious damage to the eyes of rabbits in a study in accordance with OECD TG 405 (corneal vascularization/opacity). 2-Naphthol is a skin sensitiser, based on results from a guinea pig maximization test [OECD TG 406]. An increased incidence of contact dermatitis in exposed workers is reported in an old and poorly documented study.

After repeated administration to rats by the oral route for 28 days, there were indications of a possible effect on the adrenals in both sexes at dose levels of 50 mg/kg bw/day and above (increased relative and absolute adrenal weights). At 150 mg/kg bw/day, an increase in serum creatinine and changes in serum electrolytes were found in males, indicating an effect on the kidneys.

Poorly documented studies in dogs and rats involving repeated administration by the subcutaneous and inhalation route showed effects on the liver and kidneys. Concentration dependent disturbances in blood clotting and functional impairment of the liver and kidney with accompanying histopathological effects occurred at 10.1 and 1.35 mg/m³.

2-Naphthol was not mutagenic in several Ames tests both in the absence and in the presence of metabolic activation, even at cytotoxic concentrations. Inconsistent results have been observed in bacterial DNA repair tests, but it did not induce unscheduled DNA synthesis in rat hepatocytes in a test performed according to current standards. 2-Naphthol was not tested for its potential to induce chromosomal aberrations *in vitro*. In an *in vivo* micronucleus assay with 2-naphthol, no evidence of genotoxicity was found. These data show that 2-naphthol is not mutagenic *in vivo*.

There are no adequate data available for the evaluation of the carcinogenic potential of 2-naphthol.

2-Naphthol was tested for its reproductive toxicity in a one-generation study according to OECD TG 415. The administration of the test substance had no adverse effect on the reproductive abilities of the parental generation. No teratogenic effects were observed (NOEL for male reproductive toxicity: 160 mg/kg bw/day (highest tested dose); NOELs for female reproductive toxicity and for toxicity to the offspring: 40 mg/kg bw/day each). (160 mg/kg

bw/day may suppress nursing; reduced body weights and reduced viability was seen in the offspring at 160 mg/kg bw/day). The LOEL for systemic toxicity in males was 10 mg/kg bw/day (salivation), the NOEL for systemic toxicity in females was 10 mg/kg bw/day (nasal discharge, reduced food consumption, decreased locomotor activity and salivation at 40 mg/kg bw/day).

In workers exposed to 2-naphthol an increased incidence of dermatitis, conjunctivitis, and rhinitis have been reported in poorly documented studies. In addition, changes in kidney function, and an increased incidence in chronic hepatitis and impairment of the nervous system were reported from workers who were also exposed to a variety of other chemicals.

Environment

2-Naphthol has a water solubility of 0.6 - 0.8 g/l, a vapor pressure of 1.4 Pa and a measured log Kow in the range of 2.01 – 2.84. 2-Naphthol is readily biodegradable as shown in a MITI test according to OECD 301C with non-adapted inoculum. A biodegradation of 68 % after 14 days was found. There is no information on the degradation kinetic. The measured log Kow in the range of 2.01 to 2.84 does not indicate a significant potential for bio- or geoaccumulation. With a fugacity model (Mackay I) the following distribution can be predicted: hydrosphere: 83 %, atmosphere: 8 %, soil: 4.5 % and sediment: 4.5 %. The hydrosphere is therefore the target compartment for this substance. In water solution, photodegradation has been observed, but the half-life under environmental conditions was not estimated. The calculated half-life due to photochemical-oxidative degradation in the atmosphere by OH-radicals is about 2 hours.

For 2-naphthol there are short-term tests with fish, invertebrates and algae available. The lowest effects values from the short-term tests are:

Pimephales promelas: 96h-LC₅₀ = 3.46 mg/l,
Gammarus minus: 48h-EC₅₀ = 0.85 mg/l, and
Nitzschia palea: 4h- EC₅₀ = 6.3 mg/l.

As there is no standard algae study available, the ECOSAR model was employed to predict the toxicity of 2-naphthol to green algae, resulting in a 96h-EC₅₀ of 12.9 mg/l. This supports that algae are not likely to be the most sensitive species in short-term tests. With an assessment factor of 1000 a PNECaqua of 0.85 µg/l was derived from the 48h-EC₅₀ for the most sensitive species, *Gammarus minus*.

Exposure

The worldwide production capacity of 2-naphthol is approximately 100,000 metric tonnes per year. The substance is used as an intermediate for the production of dye-stuffs, pharmaceuticals, fungicides, insecticides and odor agents. The substance is also used as an antioxidant for rubber and plastic, grease and lubricants.

Releases into the environment may occur during production and processing of 2-naphthol and from its direct use as e.g. antioxidant. Further sources are:

- the waste water from the conversion of coal to liquid and gaseous fuel products. A "typical concentration" of 50 mg/l is cited.
- the waste water of the petroleum industry.
- the groundwater near waste sites from wood-treatment processes.

An exposure of the terrestrial compartment is to be expected, as 2-naphthol is a metabolite of the herbicide naproanilide. As no further exposure data are available, the relevance of the exposure of the terrestrial compartment cannot be assessed.

2-Naphthol is a product from the atmospheric reaction of naphthalene (CAS No. 91-20-3) with hydroxyl radicals.

Occupational exposure may occur during production and processing of 2-naphthol. In Germany, the production was stopped in 1992; no workplace exposure information is available with regard to processing sites. From a European production plant workplace peak exposures between 0.0005 and 1.632 mg/m³ are reported.

Consumers may be exposed to 2-naphthol through cigarette smoke. The use of 2-naphthol in cosmetics is not allowed in the European Union and marketing of medicines containing 2-naphthol is prohibited in Germany.

RECOMMENDATION

Human Health: The chemical is currently of low priority for further work.

Environment: The chemical is a candidate for further work.

RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

Human Health: The chemical is currently of low priority for further work based on its low hazard potential. It is noted that the chemical can cause serious eye damage and is a skin sensitiser.

Environment: Little information is available about releases into the environment from production and processing sites and from the direct use of the substance. However, this information indicates that significant releases into the environment may occur. In addition, the relevance of releases into the terrestrial compartment from the metabolism of the herbicide naproanilide should be clarified. Therefore, an exposure assessment is recommended. This recommendation is based on the high toxicity of 2-naphthol to aquatic organisms. A PNECaqua of 0.85 µg/l was derived from the available short-term data. Dependent on the exposure situation further tests with aquatic and/or terrestrial organisms may be required.