

Naphthalene or naphthalene counterparts (the counterpart of naphthalene is defined by the formula C_nH_{2n-12})

Definition of causal agent

Naphthalene (synonyms: naphthalin, naphthene, tar camphor, white tar) is a white or colourless polycyclic aromatic hydrocarbon of crystalline structure. It volatilizes and sublimates at room temperature with a characteristic moth ball or strong coal tar odour (melting point 80,5 °C, boiling point 218° C). Explosive vapour may be formed above 80° C. Naphthalene and its derivatives (1-, 2-methylnaphthalene) are by-products of industrial coke and gas production, alkyl-naphthalenes are in the fraction with a distillation point between 204° C and 288° C.

Main occupational uses and sources of exposure:

Naphthalene is used in the chemical industry as the starting product in the synthesis of a number of products such as wood preservatives. Relevant workplaces and work processes are coking plants, creosote impregnation, distillation of coal tar, and the manufacture of refractories, graphite electrodes, aluminium and moth balls. Exposure can occur in the dye industry. Naphthalene has been used as lavatory deodorant discs, as intestinal antiseptic, vermicide and in the treatment of pediculosis and scabies. Exposure routes are inhalation and skin contact.

Toxic effects

1. Local effects

☐ Irritant effects

These products irritate the skin, eyes and respiratory tract. In some cases, contact with the eyes can lead to punctiform keratitis and, in particularly serious cases, corneal ulcerations. The irritant effect of alkyl-naphthalenes varies: some substances in the naphthalene family have marked effects, whereas others such as methylnaphthalene have lesser irritant effects.

See section on *Occupationally caused irritation of the skin and mucous membranes* in Annex I entry nr. 202.

2. Systemic effects

☐ Acute

On inhalation naphthalene causes headache, confusion, excitement, dizziness, nausea, vomiting, sweating, trembling and, in severe cases, convulsions. In some cases there may be dysuria, haematuria and haemolytic anaemia, particularly in subjects with a congenital glucose-6-phosphate dehydrogenase deficiency. Renal insufficiency and hepatic necrosis may follow.

Exposure criteria:

Minimum intensity of exposure: Occupational exposure confirmed, if possible assessed, by:
History and study of working conditions providing evidence of particularly intense exposure to naphthalene,
and, if available, workplace air monitoring

Guide value: Well above 10 ppm

Minimum duration of exposure: A few minutes to a few hours, depending on level of exposure.

Maximum latent period: 15 days

☐ Chronic

Chloracne (Small, pale yellow cysts and comedones) occurs from exposure to chloronaphthalenes. In very severe cases, inflammatory lesions occur with larger cysts, abscesses, follicular hyperkeratosis. The main sites affected are the face (nose generally excluded), neck, shoulders, chest, back, and scrotum. This condition is extremely persistent and may last for decades, even after exposure has ceased.

Exposure criteria:

Minimum intensity of exposure: Occupational exposure confirmed, if possible assessed, by:
History and study of working conditions providing evidence of prolonged/repeated exposure to chloronaphthalenes (usually penta- and hexachloronaphthalene derivatives). Skin contact is most often the cause of this condition, but inhalation and ingestion may also be responsible.

Minimum duration of exposure: A few weeks to a few months depending on level of exposure.

Maximum latent period: Six months.

Cataracts may follow chronic exposure. There is inadequate evidence in humans for carcinogenicity of naphthalene.