

## Benzoquinones

### Definition of causal agent

Benzoquinone is an oxidizing agent. It is a volatile, flammable solid that forms yellow crystals. The compound sublimates as soon as heat is applied, forming toxic gases. It has a penetrating odour resembling that of chlorine.

### *Main occupational uses and sources of exposure:*

Benzoquinone is used chiefly as an intermediate in the manufacture of hydroquinone, dyes and fungicides. It is also used in photography, in tanning hides, in making gelatine insoluble and in strengthening animal fibres.

Its wide use is due to its ability to transform certain nitrogen compounds into a variety of coloured substances.

Note: *The following item is covered under this entry:*

- **Leucoderma**

### Toxic effects

#### Irritant effects

Irritates the respiratory and ocular mucous membranes (causing conjunctival irritation and, in some cases, oedema and severe corneal ulceration).

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

#### Ocular effects

Chronic exposure may cause gradual brownish discolouration of the conjunctiva and cornea confined to the palpebral fissure. Small opacities and structural corneal changes result in loss of visual acuity. The pigmentary changes are reversible, but the more slowly developing structural changes in the cornea may progress.

#### *Exposure criteria:*

*Minimum intensity of exposure:* Occupational exposure confirmed by a history of occupational exposure and study of exposure conditions providing evidence of prolonged or repeated exposure to benzoquinone.

*Minimum duration of exposure:* Two years.

*Maximum latent period:* One year.

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## Leucoderma

### Definition of causal agent

The agents involved mainly belong to the phenols and catechols group. Most are used as antioxidants in the chemical and photographic industries, or in cosmetics and pharmaceuticals. They are also used in adhesives and disinfectants.

The main causal agents are listed below.

#### ***Main occupational uses and sources of exposure:***

Occupationally caused leucoderma (vitiligo, achromia) refers to depigmentation of the skin caused by occupational exposure to chemicals.

### Diagnostic criteria

- Clinical: hypopigmented and depigmented patches appear at the site of skin contact. These are usually on the exposed areas of the hands and forearms, although covered areas may be affected in some cases.  
Neither facial leucoderma nor depigmentation due to steroids, hydroxyquinoline sulphate or butyl hydroxyanisole are normally associated with occupational exposure. The depigmentations may be mottled and patchy or confluent and symmetrical. There may be some inflammation.  
There is a tendency for spontaneous but slow repigmentation after discontinuation of exposure.
- History: occupational exposure to a substance known for its depigmenting properties.

#### ***Exposure criteria:***

*Intensity of exposure:* Assessed via history.

*Minimum duration of exposure:* A few days. Leucoderma normally appears after direct and repeated skin contact, although similar effects have been reported following inhalation.

*Maximum latent period:* Several months.

Agents responsible for occupationally caused leucoderma (open, non-exhaustive list)

Phenols: p-tert-butyl phenol  
p-tert-amyl phenol  
o-phenyl phenol  
chloro-2 amino-4 phenol

Catechols: catechol (pyrocatechol)  
menthyl catechol (o-hydroxyanisole)  
4-isopropyl catechol

Hydroquinone, benzoquinone, monobenzene