

Carbon disulphide

Definition of causal agent

Carbon disulphide (CS₂) is a colourless, volatile liquid with vapours denser than air. The liquid yellows on exposure to air and light. It is highly reactive and very flammable: vapours can ignite spontaneously at temperatures above 102°C. In its pure state it has a sweet, pleasing and ether-like odour; usually it has an offensive odour due to minor impurities such as mercaptans.

Main occupational uses and sources of exposure:

Carbon disulphide is mainly used in the production of viscose rayon fibre, cellulose film and other viscose products. It is also used as a solvent and for the manufacture of pesticides, dyes, drugs and in rubber curing.

Toxic effects

1. Local effects

Irritant effects

Carbon disulphide causes irritation to the skin and the eyes.

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

2. Systemic effects

Acute effects

Central Nervous System Effects

Neurological and neurobehavioral manifestations

Hyperexcitability and mental confusion, narcosis, delirium, hallucinations, suicidal tendencies, psychosis, loss of consciousness, coma.

Exposure criteria:

Minimum intensity of exposure: Occupational exposure confirmed, if possible assessed, by:

- history and study of working conditions providing evidence of considerable exposure to CS₂;
- and, if available:
 - Biological monitoring:
2-thiothiazolidine-4-carboxylic acid (TTCA) in the urine and/or CS₂ in the exhaled air
 - Workplace air monitoring:
Guide value: atmospheric concentration > 600 mg/m³ (200 ppm)

Minimum duration of exposure: From a few minutes to a few hours depending on intensity of exposure.

Maximum latent period: 24 hours

□ **Chronic effects**

The complex nature of the metabolic effects of exposure to carbon disulphide results in a unique set of toxic effects on the target organs. These effects may appear separately or together. They can be grouped, into effects on the central nervous system, the peripheral nervous system, the cardiovascular system and the reproductive system.

□ **Effects on the central nervous system**

- Chronic toxic encephalopathy: fatigue, headache, drowsiness, memory loss.

See Annex I entry nr. 135 on *Encephalopathies due to organic solvents which do not come under other headings*.

Parkinsonism: damage to the extra-pyramidal system.
Retrobulbar optical neuritis

□ **Effects on the peripheral nervous system**

Polyneuropathy of the mixed sensory/motor type, predominantly affecting the lower limbs.

□ **Cardiovascular effects**

An increased risk of cardiovascular diseases in people exposed to CS₂.
Hypertension, Angina pectoris, increased arteriosclerosis, excess mortality from myocardial infarction.

□ **Reproductive effects**

These have been reported in exposed males (reduced sperm count and changes in sperm morphology) and females (menstrual disorders). Reduced fertility is also a recognised effect.

Exposure criteria:

Minimum intensity of exposure: occupational exposure confirmed, if possible assessed, by:

- history and study of working conditions providing evidence of prolonged or repeated exposure to CS₂;
- and, if available:
 - 2-thiothiazolidine-4-carboxylic acid (TTCA) in the urine, CS₂ in the exhaled air
 - Workplace air monitoring
 - Recommended SCOEL value: airborne concentration > 15 mg/ m³ (35 ppm)

Minimum duration of exposure: one year

Chronic encephalopathy: 10 years

Maximum latent period: Uncertain