

Acrylonitrile

Definition of causal agent

Acrylonitrile (vinyl cyanide) is at room temperature a volatile, flammable, colourless liquid with a weakly pungent odour. The vapours are explosive, with cyanide gas being produced. It may polymerize spontaneously, particularly in the presence of oxygen or visible light.

Main occupational uses and sources of exposure:

Acrylonitrile is used in the manufacture of synthetic fibres and plastic materials. The large majority is used in the production of acrylic and modacrylic textile fibres and (>50%). Other large uses include acrylonitrile-butadiene-styrene and styrene-acrylonitrile plastics, nitrile-butadiene rubber and other polymeric materials or production of acrylamide and adiponitrile.

Toxic effects

1. Acute poisoning

☐ Irritant effects

Acrylonitrile irritates skin, eyes and respiratory tract. See section on *Occupationally caused irritation of the skin and mucous membranes* in Annex I entry nr. 202.

2. Allergic effects

Acrylonitrile may cause allergic dermatoses. See section on *Occupationally caused allergic contact dermatoses* in Annex I entry nr. 202.

3. Systemic effects

Manifestations similar to cyanide poisoning (see the *hydrogen cyanide* document Annex 104.01, 104.02). Symptoms include e.g. headache, dizziness, weakness, nausea, irritability and at high doses convulsions and respiratory depression. Liver effects, manifested initially as an elevation of liver enzymes are also possible.

Exposure criteria:

Minimum intensity of exposure:

Occupational exposure confirmed, and if possible assessed, by:

- history and study of the working conditions providing evidence of massive inhalation of acrylonitrile vapours or significant skin contact with liquid acrylonitrile;
- and, if available:
 - workplace air monitoring.

For other effects the exposure levels are uncertain.

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

Maximum latent period: 24 hours.