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Monitoring and assessment of exposure to elongate mineral particles and fibres

Abstract *

The carcinogenic hazard and risk from exposure to airborne fibres of the six regulated asbestos minerals is widely acknowledged and regulated. However, the crystal structure of minerals gives rise to cleavage planes, which will have a tendency to produce particles of increased aspect ratio (length:width), when the mineral is crushed. The current methods for “regulatory” fibre counting use relatively wide acceptance criteria for the size and shape of the particles counted and often do not discriminate the mineral type. This situation is seen as over-precautionary by some industry sectors but conversely some health professionals argue that the current methods for exposure evaluation do not include the thinner and more harmful fibres.

In-vivo hazard testing of man-made vitreous fibres (MMVF) has shown the importance of fibre biodurability and more recent testing using engineered nano-objects such as: nanowires, carbon nanotubes and graphene have given important further insights into particle size and shape. This presentation reviews how this knowledge can be put to use to assess worker exposure to mineral particles.

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