

Risk assessment of nanotechnology for textiles in consumer products

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Nanotechnology is a promising technology which enables the development and application of many different types of products. Nanomaterials are used in a wide variety of pharmaceutical, food and consumer products. An important category of consumer products using nanotechnology is textiles and shoes. Nanomaterials are developed and used because they have new superior properties; however, these specific physico-chemical properties may also lead to specific risks.

International regulatory frameworks are in place for chemical substances and their use in products, requiring a proper safety evaluation or risk assessment.

At present, within the industrial chemicals domain (REACH), nanoforms of existing substances (e.g. titaniumdioxide, silver) are seen as existing substances and not as new or different substances. However, there is discussion on what kind of additional information on the physico-chemical characteristics, toxicological properties and exposure has to be submitted for these nanostructured materials. Furthermore, there is no consensus yet on how the existing toxicological testing methods and risk assessment methodologies need to be modified to address all issues arising with the assessment of nanostructured materials (including the most appropriate dose characterisation).

With respect to risk assessment of nanomaterials in textiles, some important issues are illustrated by the example of the application of nano-silver. Hardly any information is available on the concentration, shape and size of the nanoparticles used in textile products and how much of the particles may be leaching out of the product after contact with sweat or saliva. Another knowledge gap is the internal dose of the nanoparticles following exposure, which depends to a large extent on the absorption via the different ports of entry. This is extremely relevant, since when there is no absorption of the nanoparticles there is also no associated risk for human health. Therefore adequate data with regard to characterization, exposure and hazard assessment is urgently needed for a proper risk assessment.