

## Release of nanomaterials from solid nanocomposites and consumer exposure assessment - a forward-looking review - DTU Orbit (08/11/2017)

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The European chemical legislation requires manufacturers and importers of chemicals to do consumer exposure assessment when the chemical has certain hazards associated to it (e.g. explosive, carcinogenicity, and hazardous to the aquatic environment), but the question is how this obligation can be met in light of the scientific uncertainty and technical challenges related to exposure assessment of nanomaterials. In this paper, we investigate to what extent the information and data in the literature can be used to perform consumer exposure assessment according to the REACH requirements and we identify and discuss the key data needs and provide recommendations for consumer exposure assessment of nanomaterials. In total, we identified 76 studies of relevance. Most studies have analyzed the release of Ag and TiO<sub>2</sub> from textiles and paints, and CNT and SiO<sub>2</sub> from nanocomposites. Less than half of the studies report their findings in a format that can be used for exposure assessment under REACH, and most do not include characterization of the released particles. Although inhalation, dermal, and oral exposures can be derived using the guidelines on how to complete consumer exposure assessments under REACH, it is clear that the equations are not developed to take the unique properties of nanomaterials into consideration. Future research is therefore needed on developing more generalized methods for representing nanomaterial release from different product groups at relevant environmental conditions. This includes improving the analytical methods for determining nanomaterial alteration and transformation, as well as quantification, which could subsequently lead to more nano-specific consumer exposure assessment models.

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