

Nanotechnologies risk assessment: exposure and product life cycle driven methodology

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Nanomaterials (NMs) are expected to be a key in innovation breakthroughs and to lead to many new applications by 2020 (Roco 2011; Roco, et al. 2011b). However it is also well accepted that Nanomaterials will be massively transferred from the research laboratories to industry and finally to the end-consumer, only if issues on societal challenges such as sustainability and acceptance will be perfectly taken into account.

Behind this issue a key question concerns the risk of nanomaterials and nano-products. Even if a large piece of data is dedicated to address the danger and toxicity of NMs few data exist on the exposure side, the second essential aspect of risk assessment. Environmental exposure will be based on many possible abiotic and biotic processes affecting stability (bio-degradation), fate, transport, and transformation of released nanomaterials. More over as function of the different stages of life cycle of product incorporating NMs, the structure, shape and properties of released NMs will vary.

The talk will detail many possible interactions occurring while NMs are released in the environment that will affect the environment and consumer exposure. The aim of the presentation is to determine the methodology to better constrain the transfer, transformation and ecotoxicity of by-products released from nanoproducts / nanocomposite during their life cycle. It will provide the basis to develop an exposure driven risk assessment methodology. The presentation will also highlight the central role of X-ray based techniques to detect/locate and characterize nanomaterials in very complex matrixes.

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