

Nanotechnologies risk assessment: exposure and product life cycle driven methodology

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Nanotechnology appears as one of the most promising fields of science and technology that will bring beneficial effects in our lives. However, the fast development of nanomaterials and the estimated production for next years has triggered many debates concerning their safe development and use.

Behind this issue a key question concerns the risk of nanomaterials and nano-products. Even if a large piece of data is addressing the danger and toxicity of NMs few data exist on the exposure side, the second essential aspect of risk assessment. Environmental exposure is based on many possible abiotic and biotic processes affecting stability (biodegradation), fate, transport, and transformation of released nanomaterials.

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 talk is to detail the methodology to better constrain the transfer, transformation and ecotoxicity of by-products released from nanoproductions / nanocomposites during their life cycle. It will provide the basis to develop an exposure driven risk assessment methodology and a safer by design approach.

The presentation will highlight the central role of X-ray based techniques to detect/locate and characterize nanomaterials in very complex matrixes and assess their reactivity. It will also remind the instrumental role of the Pr. G. Calas courses in 1992 at the “École Nationale Supérieure de Géologie”(Nancy France) which seeded the germs of our multidisciplinary and molecular scale approach.

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