

Exposure to Engineered Nanomaterials, seven case studies within the LabEX SERENADE project : a Safer by Design approach.

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Abstract

Nanomaterials are expected to be a key to innovation breakthroughs and to lead to many new applications by 2020 and further. To reach the forecasted level of economical development, the public acceptance of nanotechnology is essential not only in terms of human health safety but also concerning the environmental impact. This lead manufacturers to develop sustainable processes of production, taking account safety and acceptance considerations since first steps of the design and during the entire production of new-generation nanomaterials.

The LabEX (Laboratory of Excellence) SERENADE (funded since 2012 by the French "Investissements d'Avenir" project) proposes an integrated scientific and educational approach to develop new concepts and tools for the Safer Design of next generation Nanomaterials and manufacturing processes. It is supported by a French national multi-disciplinary network of 11 academic partners including most of the French pioneering groups in the field from fundamental to applied research and education and 2 industrial partners (Suez-Environment, ALLIOS).

SERENADE initiated seven integrated case studies aiming at testing the SERENADE "Safer by Design" methodology on various product types (photocatalytic paints, sunscreen, quantum dots, silver nanowire, food packaging) and examining the often neglected end of life stage. We present the first results of the different case studies with a specific focus on the determination of consumer and environmental exposure.