Six Open Questions about the Migration of Engineered Nano-Objects from Polymer-Based Food Contact Materials: A Review - DTU Orbit (22/12/2018)

The use of nanomaterials in food contact applications has created enormous interest in recent years. The potential migration of engineered nano-objects (ENOs) from food contact materials (FCMs) is one of the most important concerns regarding potential human exposure to ENOs and health risks. Current research focusing on FCMs has often reached inconsistency regarding migration of ENOs. The scope of this critical review is to give a concise overview of the most relevant aspects of the subject, and to identify and discuss the major open questions in relation to migration of ENOs from FCMs. This includes the very fundamental questions whether ENOs can migrate from FCMs at all and what the potential release mechanisms of ENOs could be. The inconsistency of findings from experimental studies is highlighted based on the example of silver nanoparticle migration from polymer-based FCMs. Challenges in detection and characterization of ENOs in migration studies and the suitability of the most frequently used analytical techniques are discussed. Further, this review questions the suitability of standard food simulants and migration test conditions for FCMs as well as of conventional mathematical migration models. Considerations regarding the risk for the consumer associated with migrating ENOs from FCMs are discussed.

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