ENVR 86: Microplastic exposure assessment from the perspective of nanoparticle research

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Body

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Although marine littering has been controlled since the 1970s, the debate on the occurrence and the consequences of plastic particles with sizes between 1 µm and 5 mm, so-called microplastics, in the environment has received increased attention only in the recent decade. There is a rapidly growing body of published research into the impacts of microplastics on various ecosystems. Yet our understanding of the occurrence, behavior and transport of microplastics in aquatic systems and to ultimately acquire the ability to assess their risks, remains insufficient. The open research questions and challenges to close these knowledge gaps for microplastics are very similar to topics and challenges for the research on potential environmental implications of engineered nanoparticles (ENPs). In this contribution, current challenges and open questions regarding the fate and exposure assessment of microplastics are related to lessons learned over a decade of studying ENPs in the environment. First, the similarities between both materials are used to identify the transferrable knowledge to microplastics exposure assessment. For example, to understand the transport and transformation processes, laboratory and mesocosm studies as well as environmental fate models for ENPs have been developed in recent years, with varying levels of detail, realism, and spatial resolution. Many of these approaches could serve as a starting point to study microplastics. This is then followed by a critical discussion of differences requiring specific adjustments for microplastics. In order to quantify the release of secondary microplastics, quantification of mismanaged plastic waste, which is released in the aquatic environment, and determination of the fragmentation rates of the released plastic waste in the aquatic environment are required. The aim of this work is to support a more rapid development of the tools and methods required to advance microplastics exposure and ultimately risk assessment to take prompt and necessary regulatory actions.

Sessions

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Sunday, Mar 18 2:55 PM
Room 348, Ernest N. Morial Convention Center
(/acsnola2018/event/a7422dad885fd6eb824e45083638439e)