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ABSTRACTS

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Fate, Behaviour and Toxicity of Engineered Nanomaterials in the Environmental Systems

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1. Introduction

Historical analysis of different technologies' evolution reveals how many of them failed to achieve the intended societal benefits. This is primarily because their associated health, safety, and environmental effects were detrimental to the society, and led to their ban (e.g. asbestos, MBDT, etc). During the 20th century, nanotechnology joined the ranks of among the rapidly emerging set of technologies with the potential to offer a new era, or even the next industrial manufacturing revolution. Therefore, several questions merit answers as part of enhancing our collective understanding on the potential impacts of nanomaterials in the environmental systems, and how they should be mitigated (if any). First, has the society learned from previous technologies failures and inability to reach their full potential despite the good intentions? Secondly, how has such knowledge influenced the approaches adopted in addressing the potential risks of nanotechnology towards achieving the "triple principles" of safe, responsible, and sustainable exploitation as part of optimizing the societal benefits? To address these questions, in this presentation, an outline overview on the fate, behaviour, and toxicity of engineered nanomaterials (ENMs) in the environmental systems is presented, in four broad parts in attempt to address these questions, These include: (i) a summary of what is known concerning the potential risks of ENMs in the environmental systems, (ii) the environmental processes that control fate, behaviour and toxicity of ENMs, (iii) likely risk profiles of different nanomaterials derived based on the presently accessible data, and (iv) outline a set of recommendations that may offer a pathway towards narrowing the present knowledge gaps concerning risk assessment of ENMs in the environmental systems.

2. References

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