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EVALUATING THE SUSPENSION POTENTIAL OF MANUFACTURED NANOPARTICLES IN LANDFILL LEACHATE

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Abstract

Nanoparticles (NPs) have recently been concerned as emerging contaminants. Determination of NPs in different environmental compartments is a revealing topic for researchers studying their impacts in nature. Various methods of analysis have been reported in literature for their measurement and recovery. However, there are difficulties in their quantification in landfill leachate. Taking into account varying landfill components and their possible interactions with NPs, different types of NPs were investigated in this study. Total concentrations of metals from commonly used TiO₂, ZnO (coated and uncoated), and SiO₂ NPs were quantified in deionized water and in two different types of landfill leachate. Percent recoveries of metals from different NPs i.e., ZnO and TiO₂ added to deionized water ranged between 76%-129%, whereas percent recoveries in leachate were generally less around 45%-99%. On the other hand, the percent recovery results of SiO₂ were quite high in the range of 65%-99% and comparable to those in deionized water. Considering the complex nature of leachate matrix lower results would be acceptable.

Key words: acid digestion, landfill, leachate, nanoparticle, recovery

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