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"Gheorghe Asachi" Technical University of Iasi, Romania

EVALUATING THE SUSPENSION POTENTIAL OF MANUFACTURED NANOPARTICLES IN LANDFILL LEACHATE

Ceyda Senem Uyguner-Demirel, Tugce Sakallioglu**

Bogazici University, Institute of Environmental Sciences, 34342, Bebek, Istanbul, Turkey

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 quatification 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 TiO_2, ZnO (coated and uncoated), and SiO_2 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 TiO_2 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 SiO_2 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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*Author to whom all correspondence should be addressed: e-mail: uygunerc@boun.edu.tr