



Visions for a Sustainable Planet

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381-11 Lead and Tin Transport and Retention in Soils: Miscible Displacement and Modeling.

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Wednesday, October 24, 2012
Duke Energy Convention Center, Exhibit Hall AB, Level 1



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Poster Presentation
• [Sn Pb SSSA_Oct12 12.pdf](#) (1.4 MB)

Miscible displacement column experiments were carried out in this study to assess mobility and reactivity of tin (Sn) and lead (Pb) in soils. Two soils were used, an Olivier soil (fine-silty, mixed, active, thermic Aquic Fraglossudalfs) and a Windsor soil (mixed, mesic Typic Udipsamments). Pulses of Sn and Pb were introduced consecutively (Pb - Sn and Sn-Pb pulse sequence) or mixed (Pb and Sn) into miscible displacement columns of water-saturated soils. Effluent results indicated extremely limited mobility of Sn where > 99% of applied Sn was retained in the columns for both soils. In contrast, breakthrough results for Pb exhibited extensive mobility in the two soils. Pb recovery in the effluent solution from Olivier soil columns was 57.6% and 96.4%, for the Sn-Pb pulse Pb-Sn pulse sequences, respectively. For Windsor soil, the respective Pb recoveries were 37.4% and 52%. A nonlinear equilibrium-kinetic multireaction approach was used to describe breakthrough curves (BTCs) for Pb and Sn in the effluent solution and that retained by the soil.

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