Persistence of selected ammonium- and phosphonium-based ionic liquids in urban park soil microcosms - DTU Orbit (28/12/2018)

Persistence of selected ammonium- and phosphonium-based ionic liquids in urban park soil microcosms

Knowledge about biodegradability of ionic liquids (ILs) in terrestrial systems is limited. Here, using urban park soil microcosms spiked with either ammonium- or phosphonium-based ILs [didecyldimethylammonium 3-amino-1,2,4-triazolate, benzalkonium 3-amino-1,2,4-triazolate, trihexyl(tetradecyl)phosphonium chloride, or trihexyl(tetradecyl)phosphonium 1,2,4-triazolate], we studied their (i) 300-day primary biodegradation, and (ii) influence on CO2 evolution from the microcosms. The primary biodegradation ranged from 21 to 33% of total compound in the dissolved phase. The evolution of CO2 from spiked microcosms was either lower or within the range of background soil respiration, indicating no or small mineralization of the parent compounds and/or their metabolites, and their negligible or small toxicity to soil microorganisms. Our results suggest the potential for persistence of the four studied ILs in urban park soils. •Primary, 300-day biodegradation ranged from 21 to 33%.•CO2 evolution from the spiked soils was within the range of background respiration.•The studied ILs show potential for long-term persistence in urban park soils.

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