



Distribution and fate of perfluorinated compounds (PFCs) in a pilot constructed wetland

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ABSTRACT

Removals of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in pilot-scale constructed wetland were investigated in this study. Phytoextraction by four aquatic plants (*Hygrophila pogonocalyx* Hayata, *Ipomoea aquatic* Forssk, *Ludwigia (x) taiwanensis* and *Eleocharis dulcis*) and sorption onto soil were determined. Both PFOA and PFOS were fairly phytoextracted by four aquatic plants; the uptake capacity was found in the following order: *Hygrophila pogonocalyx* Hayata > *Ipomoea aquatic* Forssk ≈ *Ludwigia (x) taiwanensis* > *Eleocharis dulcis*. In the soil sorption experiment, equilibria for PFOA and PFOS were achieved within 6 d; sorption capacity of 2–3 µg/g was observed at the end of the 15 d experiment. Experimental results and literature review suggest that phytoextraction and soil sorption were the most significant mechanisms for PFOA and PFOS disappearance in the pilot-scale constructed wetland, while contributions of biodegradation, photolysis, volatilization and hydrolysis were negligible.

Keywords: Constructed wetland; Perfluorooctanoic acid; Perfluorooctane sulfonate; Sorption; Phytoextraction; Soil

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