



Sorption of perfluoroalkyl substances (PFASs) onto wetland soils

Ying-Chin Chen^a, Shang-Lien Lo^{a,*}, Nien-Hsun Li^a, Yu-Chi Lee^a, Jeff Kuo^b

^aGraduate Institute of Environmental Engineering, National Taiwan University, 71, Chou-Shan Road, Taipei 106, Taiwan, ROC

Tel. +886223625373; Fax: +886223928821; email: sllo@ntu.edu.tw

^bDepartment of Civil and Environmental Engineering, California State University, Fullerton, CA, USA

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ABSTRACT

The sorption of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) onto five types of soils was investigated in this study. Effects of inorganic salts (CaCl₂, NaCl, and Na₂SO₄) and humic acid (HA) in solution on the extent of sorption of PFOA and PFOS were evaluated. The results indicated that all types of soils had a higher affinity for PFOS than for PFOA. The extent of sorption for PFOA and PFOS increased with the fraction of organic carbon (f_{oc}) of soils. The partition coefficient (K_d) values of PFOA and PFOS increased with f_{oc} and ionic strengths of inorganic salts. On the contrary, the K_d values decreased with an increase in the concentrations of HA in the solution. The existence of organic matter is the parameter dominating the sorption behaviors of both PFOA and PFOS onto all types of soils studied. In addition, the presence of inorganic salts also affects PFAS's sorption behaviors. The results in this study should verify profitable for PFOA and PFOS environmental fate modeling and risk assessment in wetland systems.

Keywords: Perfluorooctanoic acid; Perfluorooctane sulfonate; Sorption; Soil; Organic matters

*Corresponding author.