

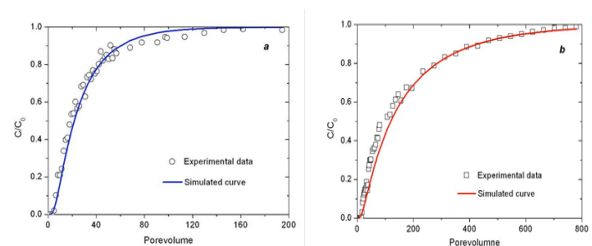
## Effect of humic acid on BDE 47 transport in sand column

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Hydrophobic PBDEs (Poly Brominated Diphenyl Ethers) have been detected recently as a groundwater contaminant [1] [2]. Humic acid (HA) is suspected as an important carrier that facilitates moving PBDEs into subsurface environment. In this study, we investigated the migration of BDE 47 in presence of different HA concentrations in a sand column to provide insights into the role of HA in PBDEs migration in porous media. BDE 47 solutions (10 ppb) with 0.1 ppm and 1.0 ppm HA were pumped into sand columns, effluents were collected for measuring BDE 47 concentrations using a recently developed, fluorescence-based method [3].



**Figure 1.** Experimental and modeling results of BDE 47 transport in a sand column added with 1.0 ppm (a) and 0.1 ppm (b) HA solutions.

Experimental and modeling results (Figure 1) collectively show that the mobility of BDE 47 increased significantly with increasing HA concentration. Molecular simulations indicated that BDE 47 hydrophobicity decreased (from 6.64 to 4.03) after its interaction with HA by hydrogen bonding or hydroxyl, leading to its increased mobility in groundwater.

[1] Yogui, G.T. and Sericano, J.L., 2009. *Environ Int.*, **35**, 655-666. [2] Levison J. et al., 2012, *Hydrogeol J*, **20**, 401-412. [3] Shan Huimei. et al., 2015, *J Anal Methods Chem*.