SORPTION OF IBUPROFEN ON SEDIMENTS FROM THE DOBCZYCE (SOUTHERN POLAND) DRINKING WATER RESERVOIR

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Abstract: This work determined the solid-water distribution coefficient Kd, the Freundlich constant KF and the organic carbon normalized coefficient KOC of ibuprofen in natural, aquifer sediments. They are characterized as silt sediments with different clay and sand fraction contents varied in specific surface areas. Content of organic carbon and pH are on the same level. For determining sorption coefficients values of ibuprofen in sediments, its concentration was measured in the aqueous and calculated in the solid phase. Batch tests were conducted following OECD Guideline 106. The resulting Kd values ranged between 1.14 and 2.29 L/kg, KF between 0.25 and 5.48 and KOC between 1.22 and 2.53 for ibuprofen in sediments S1 and S2, respectively. These experiments
proved that the presence of clay minerals beside organic carbon and pH might be relevant in sorption of ibuprofen in sediments. A comparison of experimentally determined KOC with modelled KOC calculated on the base of octanol-water partitioning coefficient KOW shows that the prediction of sorption behaviour cannot be based only on KOW. This is probably due to the fact that these approaches well describe hydrophobic interactions, but fail to predict sorption of polar and ionic compounds.