MODELING OF VOLATILE ORGANIC CONTAMINANTS SORPTION ON ORGANIC MATTER AND MINERAL SURFACES

MODELOVÁNÍ SORPCE TĚKAVÝCH ORGANICKÝCH LÁTEK NA ORGANICKOU HMOTU A NA MINERÁLNÍ SLOŽKY V ZEMINÁCH

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Abstract:
The work presents an innovative approach to the theoretical modeling of equilibrium distribution of volatile organic contaminants in three phase soil system (soil dry matter - soil water - soil air). Extended sorption coefficient is introduced to the model comprising, as the two original members, specific sorption to silicon and aluminum based soil constituents. The model suggested was verified experimentally through the laboratory-scale simulation of tetrachloroethylene sorption on five different soils. Artificially contaminated soil samples were equilibrated in 40 ml glass flasks, which were followed by head-space tetrachloroethylene analysis providing input data to the equilibrium distribution model. The results completed in this work well confirmed the validity and high practical importance of the extended soil sorption coefficient, which can easily be constructed by means of fast and cheap soil elemental analysis.

Keywords:
Sorption, modeling, soil, VOCs, fugacity