

EFFECTS OF SORBENT AND ORGANISM ON BIOAVAILABILITY OF SORBED ORGANIC CONTAMINANTS

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ABSTRACT

The bioavailability of sorbed pollutants is important in determining both the time required and the achievable end-point for bioremediation of sites with contaminated soils. In the present study, bioavailability was investigated using combinations of four sorbents and four organisms. Experimental and mathematical approaches were developed to evaluate desorption and biodegradation rates in systems where individual processes were operative, and interactions between the processes in combined systems. This study demonstrates the existence of enhanced bioavailability for some sorbed contaminants, which cannot be explained by sequential desorption and liquid-phase degradation mechanisms alone. In some cases it was also found that non-water-desorbable contaminant could be biodegraded. Bioavailability varied with the distribution coefficient and biokinetics. Enhanced bioavailability could be described using a model formulation that include sorbed-phase degradation.