

## **Polycyclic Aromatic Hydrocarbons in River Floodplain Soils: Coal and Coal-derived Particles**

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Polycyclic aromatic hydrocarbons (PAHs) are widespread contaminants which occur in sediments or soils in elevated concentrations. The mobility of these contaminants, including sorption and desorption, is the important mechanism which is known to affect their transport, fate and eco-toxicological risk in the water-soil/sediment system.

Very high concentrations of PAHs were found in floodplain soils of the Mosel river, Germany. These soils were characterized by large amounts of coal and coal-derived particles, which were identified by organic petrographic analysis. The soil samples were separated into light fractions, heavy fractions and grain size fractions by use of physical separation. This method was preferred to chemical treatment in order to minimize the alteration of the geosorbents.

PAHs were determined in each sub-fraction. The highest concentrations occurred in the light fractions, which are abundant of coal and coal-derived particles. Sorption experiments of phenanthrene in the light fractions, heavy fractions and in the original soils showed a very strong sorption capacity of the light fractions. The experiments also indicated that adsorption on the high surface area and within micro-porosity of coal and coal derived particles occurred in the samples. Desorption kinetic experiments with several sub-fractions and original soils showed the slow and very slow desorption of PAHs from these coal and coal derived particles in the soils.