

Remediation of metal-contaminated sediment using activated carbon

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In this study, the effectiveness of nitric acid-NaOH-modified activated carbon (NAC) for immobilization of zinc(Zn), cadmium (Cd) and lead (Pb) by decreasing the bioavailable fraction was investigated using a series of laboratory sediment remediation microcosms. Modification of AC was done by adding, surface oxygen groups such as carboxylic groups, which are essential adsorption sites for Zn, Cd and Pb were generated. In batch experiments, the effects of ionic strength and competitive sorption on the adsorption profiles of activated carbon for metals were investigated. Specific surface area, pore volume, oxygen-containing functional groups, and cation exchange capacity were all significantly higher in the NAC compared to the AC. Except for the oxygen concentration, surface oxidation of AC had no effect on its surface characteristics, resulting in increased sorption capacity for heavy metals. Ultimately, this study demonstrates the applicability for NAC for in situ sediment remediation