Effects of initial soil water content on EK-Fenton process for removal of phenanthrene

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When EK-Fenton process was applied to remediate a contaminated site, soil water content (SWC) had to be considered because SWC would affect the transport of contaminant and additives. To investigate effects of initial SWC on EK-Fenton process, Indonesia kaolin and phenanthrene were used as a model soil and a representative PAH, respectively. Soil samples with initial SWCs of 35, 25, 15, 5, and 0 % were prepared to determine their effects on the removal efficiency of contaminant. SWC of 35 % indicated that soil was completely saturated with water. Although initial SWCs were different from one another, final SWCs increased to about 35 % in all cases by electroosmotic phenomena. Electrical potential gradient of soil sample with initial SWC of 0 % was initially high due to high resistance of soil, but within 30 minutes, decreased by the transport of water through the soil system due to capillary attraction. The removal efficiency of EK-Fenton process was ranged from 88.6 to 94.2 % for 7 days.