Electrodialytic soil remediation enhanced by low frequency pulse current - DTU Orbit
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Electrodialytic soil remediation enhanced by low frequency pulse current: Overall chronopotentiometric measurement
The effect of low frequency pulse current on decreasing the polarization and energy consumption during the process of electrodialytic soil remediation was investigated in the present work. The results indicated that the transportation of cations through the cation exchange membrane was the rate controlling step both in constant and pulse current experiments, thus responsible for the major energy consumption. After 180 h, a decrease in both the initial ohmic resistance in each pulse cycle and the resistance caused by concentration polarization of the anion exchange membrane were seen in the pulse current experiment compared to the constant current experiment. At the cation exchange membrane, only the resistance caused by concentration polarization decreased. In the soil compartment, an average of +60 mV overpotential caused by the polarization of the electric double layer of the clay particles was obtained from the Nernstian behavior simulation of the relaxation process, which was significantly lower than the ohmic voltage drop induced by pore fluid resistance. Therefore, the ohmic polarization was the major contributor to the energy consumption in the soil compartment and diminished by pulse current.

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Contributors: Sun, T. R., Ottosen, L. M., Mortensen, J.
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