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New process for copper migration from contaminated soil and bioelectricity generation in soil microbial fuel cells

Hui Wang, Hailing Song, Ran Yu Xian Cao, Zhou Fang and **Xianning Li**
Southeast University School of Energy and Environment, China

The soil microbial fuel cell (MFC) is a promising biotechnology for the bioelectricity recovery as well as the remediation soil. Moreover there were no studies on the heavy metal pollution in a soil MFC yet. A soil MFC was constructed to remediate the contaminated soil and the electric field was generated from the oxidation of the acetate at the anode. We demonstrated that the copper migration, the power generation and the pH variation in the soil and the electrodes. The maximal voltage and the power density of 539 mV and 65.77m W/m^2 were obtained in the soil MFC. The chemical fractionation of copper (Cu) was analyzed with a modified BCR sequential extraction method. The soluble Cu form and the total Cu contents from the anode to the cathode increased and the difference between them kept growing over time. The Cu fractions in the soil and the electrodes were converted with the change of the dramatic pH from the anode to the cathode. There was a focusing effect leading to the change of the copper forms and the extractable acid form content increased in the three-fifths where the acid and the alkali fronts met.

Biography

Hui Wang is currently pursuing PhD from Southeast University School of Energy and Environment, China. He has majored in soil science and heavy metal pollution renovation. He has published one paper in reputed journals.

lwcq306@163.com

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