Xian Cao et al., J Biotechnol Biomater 2016, 6:8(Suppl)
http://dx.doi.org/10.4172/2155-952X.C1.067

Simultaneous degradation of refractory organic pesticide and bioelectricity generation in a soil microbial fuel cell with different conditions

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

In this study, the soil microbial fuel cells (MFCs) were constructed based on sandy soil to remove the refractory organic pesticide hexachlorobenzene (HCB) in top soil by a simple method. The construction of membrane less single-chamber soil MFCs by setting up the cathode and the anode activated carbon, inoculating the sludge and adding the co-substrates can promote HCB removal significantly. The results showed that HCB removal efficiencies in the soils contaminated with 40 mg/kg, 80 mg/kg, and 200 mg/kg were 71.14%, 62.15% and 50.06%, respectively, which were 18.65%, 18.46% and 19.17% higher than in the control, respectively. The electricity generation of soil MFCs in different HCB concentrations was analyzed. The highest power density reached 70.8 mW/m^2 and an internal resistance of approximately 960 Ω was obtained when an external resistance loading of 1000 Ω was connected. Meanwhile, the influences of temperature, substrate species and substrate concentrations on soil MFCs initial electricity production were investigated. The temperature between 25 °C and 30 °C had no influence on the initial electricity production in the soil MFC while the impacts of the substrate concentration were significant. The addition of the anionic surfactant sodium dodecyl sulfate (SDS) into the soil MFCs system contributed to the improvement of HCB removal efficiency.

Biography

Xian Cao is currently pursuing PhD at the Southeast University School of Energy and Environment, China. He has published one paper in reputed journal.

lovevolkswagen@vip.qq.com

Notes: