Environmental Engineering and Management Journal *October 2016, Vol.15, No. 10, 2215-2221*
http://omicron.ch.tuiasi.ro/EEMJ/

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ENHANCED DEGRADATION OF CHLORAMPHENICOL IN SOIL USING ACTIVATED CARBON FIBER SUPPORTED NANOSCALE ZEROVALENT IRON COUPLED WITH MICROWAVE IRRADIATION

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Abstract

The objective of this research was to study the degradation of chloramphenicol (CAP) in soil using activated carbon fiber supported nanoscale zerovalent iron (ACF/nZVI) coupled with microwave (MW) irradiation. Compared to ACF/MW, nZVI/MW and MW alone, the ACF/nZVI/MW system had a higher degradation efficiency. A Box-Behnken experimental design was employed to analyse relative significance of independent variables A (irradiation time), B (MW power), and C (MW absorber dosage), and combined effects of the three independent variables at three levels, in the removal of CAP. RSM analysis demonstrated that the three independent factors and interaction of any two all indicate significant influence, and the optimum conditions were set as: 700 W for MW power, 30 min for irradiation time, and 0.03 g for the dosage of ACF/NZVI. This technology is expected to be a cost-effective and environmentally friendly microwave treatment.

Key words: activated carbon fiber supported nanoscale zerovalent iron, chloramphenicol, microwave, soil remediation

Received: March, 2016; Revised final: September, 2016; Accepted: October, 2016

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