

Accepted Manuscript

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PII: S1385-8947(17)32233-7
DOI: <https://doi.org/10.1016/j.cej.2017.12.111>
Reference: CEJ 18272

To appear in: *Chemical Engineering Journal*

Received Date: 7 November 2017
Revised Date: 20 December 2017
Accepted Date: 21 December 2017

Please cite this article as: X. Tang, Q. Li, Z. Wang, Y. Hu, Y. Hu, R. Li, In situ electrokinetic isolation of cadmium from paddy soil through pore water drainage: Effects of voltage gradient and soil moisture, *Chemical Engineering Journal* (2017), doi: <https://doi.org/10.1016/j.cej.2017.12.111>

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In situ electrokinetic isolation of cadmium from paddy soil through pore water drainage: Effects of voltage gradient and soil moisture

Xianqiang Tang^{a,b,c*}, Qingyun Li^{a,b}, Zhenhua Wang^{a,b,c}, Yanping Hu^{a,b}, Yuan Hu^{a,b}, Rui Li^{a,b}

^a *Basin Water Environmental Research Department, Changjiang River Scientific Research Institute, Wuhan 430010, China*

^b *Key Lab of Basin Water Resource and Eco-Environmental Science in Hubei Province, Wuhan 430010, China*

^c *Collaborative Innovation Center for Geo-Hazards and Eco-Environment in Three Gorges Area, Hubei province, Yichang 443002, China*

*Corresponding author. Email: ckyshj@126.com (Xianqiang Tang). Tel.: +86-027-82926192. Fax: +86-027-82926680

ABSTRACT

Novel equipment based on electrokinetic geosynthetic (EKG) technology was developed for the in situ isolation of heavy metals from paddy soil through pore water drainage. Four mutually independent field plot experiments (A, B, C, and D) were conducted to investigate the effects of soil moisture (complementation or not) and the voltage gradient (0.5, 1.0, and 2.0 Vcm⁻¹) on pore water drainage capacity, cadmium (Cd) removal performance, energy consumption, and soil chemical properties.

0.03M FeCl₃ and 0.03M CaCl₂ were used to saturate the soil for 24 h, the reduction in the total soil Cd content was 29.63%, 25.93%, 38.27%, and 41.98% after 7 days of treatment, and the corresponding energy consumption was 3.48, 16.79, 12.23, and 9.47 kWh for plots A, B, C, and D, respectively. Soil moisture complementation and an increase in the electric field intensity favored soil Cd removal, but

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