

Accepted Manuscript

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PII: S1383-5866(17)30940-1

DOI: <http://dx.doi.org/10.1016/j.seppur.2017.08.010>

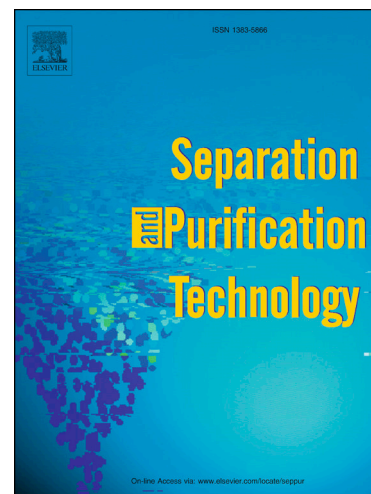
Reference: SEPPUR 13952

To appear in: *Separation and Purification Technology*

Received Date: 24 March 2017

Revised Date: 31 July 2017

Accepted Date: 5 August 2017



Please cite this article as: M. Kalaruban, P. Loganathan, J. Kandasamy, R. Naidu, S. Vigneswaran, Enhanced removal of nitrate in an integrated electrochemical-adsorption system, *Separation and Purification Technology* (2017), doi: <http://dx.doi.org/10.1016/j.seppur.2017.08.010>

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Enhanced removal of nitrate in an integrated electrochemical-adsorption system

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Abstract

The electrochemical (EC) method of removing pollutants in water is a widely used process in water and wastewater treatment. An EC-adsorption integrated system was investigated to test whether the simultaneous removal of nitrate by the two processes would be better than removal utilising the individual EC and adsorption methods. In the integrated system, an adsorbent (ion exchange resin - Dowex 21k XLT) was placed inside a stainless steel box that served as an anode with a Cu plate as cathode. In an experiment using 2 L nitrate solution containing 20 mg N/L and 2 g adsorbent the rate of nitrate removal in the integrated system was initially fast with 35% removed in 30 min, though slowing down later. The rate of removal increased with increasing current, voltage and pH up to 7 but decreased as the distance between the electrodes also increased. The optimum nitrate removal of 67% was obtained at pH 7, 1 A, and 31 V for a distance of 1 cm between the electrodes after 180

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