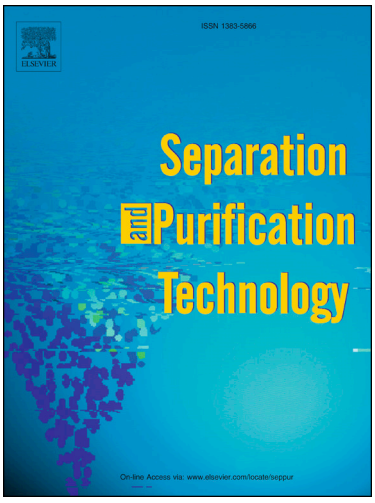

Nanosheet α-$Co(OH)_2$ composite membranes with ultrathin separation layer for removing dyes from solvent with high flux

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PII: S1383-5866(18)31515-6
DOI: https://doi.org/10.1016/j.seppur.2018.07.001
Reference: SEPPUR 14732

To appear in: *Separation and Purification Technology*

Received Date: 3 May 2018
Revised Date: 2 July 2018
Accepted Date: 2 July 2018

Please cite this article as: H-X. Liu, C. Zhao, N. Wang, L. Shu, J. Zhou, S. Ji, J-R. Li, Nanosheet α-$Co(OH)_2$ composite membranes with ultrathin separation layer for removing dyes from solvent with high flux, *Separation and Purification Technology* (2018), doi: https://doi.org/10.1016/j.seppur.2018.07.001

Nanosheet α-$Co(OH)_2$ composite membranes with ultrathin separation layer for removing dyes from solvent with high flux

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Abstract: Organic solvent nanofiltration (OSN) is one of the fast development areas of membrane separation. The nanofiltration performances of membranes are mainly depended on the thickness of separation layers and the orientation of separation channels. Herein, an ultrathin α-$Co(OH)_2$ film was fabricated through the *in situ* growth of α-$Co(OH)_2$ nanosheets on alumina tubular substrate for OSN. The thickness of the film was approximately 300 nm and the α-$Co(OH)_2$ nanosheets were vertically grown to leave channels perpendicular to the substrate. The orientation growth and interlayer gallery of the α-$Co(OH)_2$ layer were confirmed by SEM, PXRD and SAXS characterization. The resulting composite membrane exhibits high fluxes for organic solvents. Particularly, in separating eriochrome black T from methanol solution, the permeance could reach 127 $L \cdot m^{-2} \cdot h^{-1} \cdot bar^{-1}$. We anticipate that the facile fabrication method and excellent separation performances make the α-$Co(OH)_2$ composite membrane have a great application potential in OSN.

Keywords: dye removal; α-$Co(OH)_2$ composite membrane; *in situ* growth; ultrathin separation layer; high flux

1. Introduction

Organic solvent nanofiltration (OSN) is one of the fast development areas of

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