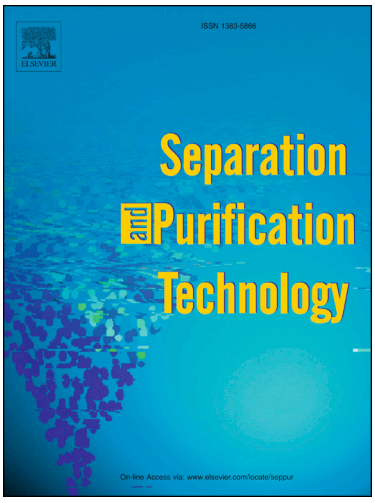

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Synthesis and characterization of a new hydrophilic boehmite-PVB/PVDF blended membrane supported nano zero-valent iron for removal of Cr(VI)

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Abstract

A novel composite based on hydrophilic boehmite-PVB/PVDF blended membrane-immobilized nanoscale zero-valent iron (nZVI) (BPPN) was synthesized. When the initial concentration of Cr(VI) was 20 mg/L, 100% Cr(VI) was removed by BPPN at an initial pH of 4.08 under room temperature of 25 ºC within 90 min. In addition, the reactivity of the regenerated BPPN composites toward Cr(VI) removal were not obviously declined after 6 cycles. The resultant BPPN demonstrated high reactivity, preeminent stability and reusability in the reaction course. Meanwhile, the BPPN composites showed a higher removal efficiency toward the removal of Cr(VI) compared with alumina-PVB/PVDF-nZVI (APPN) composites. The plentiful hydroxyl groups of boehmit on the BPPN surface resulted in the enhancement in hydrophilicity and improved Fe^0 loading of the BPPN composites. For environmental parameters, results indicated that there was a negative effect of increasing the initial concentration or decreasing reaction temperature toward the removal of Cr(VI) by BPPN, and that the acidic and neutral conditions showed more favorable effect on Cr(VI) removal