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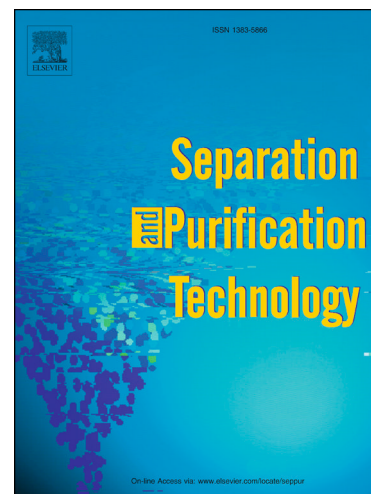
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Chia-Chang Lin, Shih-Ting Hsu

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Performance of nZVI/H₂O₂ process in degrading polyvinyl alcohol in aqueous solutionsChia-Chang Lin^{a,b,*} and Shih-Ting Hsu^a

^aDepartment of Chemical and Materials Engineering, Chang Gung University, Taoyuan, Taiwan, R.O.C.

^bDepartment of Psychiatry, Chang Gung Memorial Hospital, Linkou Branch, Taoyuan, Taiwan, R.O.C.

*corresponding author at: Department of Chemical and Materials Engineering, Chang Gung University, Taoyuan, Taiwan, ROC. Tel.: +886 3 2118800#5760. E-mail address: hige@mail.cgu.edu.tw (C. C. Lin).

Abstract

A rotating packed bed with blade packings was used to obtain nanoscale zero-valent iron (nZVI). Polyvinyl alcohol (PVA) was degraded by the nZVI/H₂O₂ process, and the effects of the addition of oxygen, pH, nZVI dosage, and H₂O₂ concentration on this process were determined. The efficiency of degradation of PVA in the presence of air exceeded that in the presence of nitrogen. The efficiency of degradation of PVA under acidic conditions was higher than that under alkaline conditions. The degradation of PVA by the nZVI/H₂O₂ process was optimized at a particular nZVI dosage and H₂O₂ concentration. At pH 3 with an nZVI dosage of 0.005 g/L and an H₂O₂ concentration of 1×10^{-4} mol/L in the presence of air, the nZVI/H₂O₂ process using the produced nZVI degraded 94% of the PVA in 1 min; this efficiency of degradation was much higher than that obtained using nZVI that was supplied by Alfa-Aesar.

Keywords: Nanoscale zero-valent iron; Polyvinyl alcohol; H₂O₂; Degradation

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