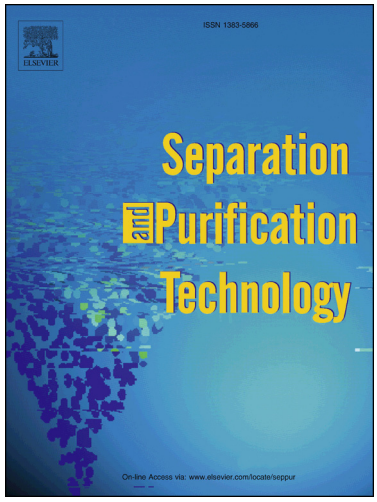

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Highly efficient advanced oxidation processes (AOPs) based on pre-magnetization Fe^0 for wastewater treatment

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ABSTRACT: Advanced oxidation processes (AOPs) has great potential for wastewater treatment, bust still limited in application due to their high cost for extensive reagent and energy demand, and restricted working conditions (e.g. narrow pH range). Here, AOPs based on pre-magnetization Fe^0 (Pre-Fe^0) were found to be highly efficient at wider pH conditions, partly solved the above problems. After pre-magnetization, Fe^0 was supposed to be easier to be corroded, which remarkably improved processes (e.g., Pre-Fe^0/H_2O_2, Pre-Fe^0/$K_2S_2O_8$) efficiency several to >100 folds and valid for many refractory contaminants (e.g. dyes, phenols, organic acids), compared with that conventional processes without pre-magnetization. Moreover, the process efficiency could be sustained by the recovery of magnetism of Pre-Fe^0. Thus AOPs based on pre-Fe^0 is more promising to take place of conventional Fe^0 based AOPs since it more efficient but does not require any change of the present water and wastewater treatment process, and does not need an extra energy source, costly materials, and complex equipment.

Keywords: AOPs; pre-magnetization Fe^0; remarkable improvement; refractory contaminants

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