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Evaluation of sulfadiazine(SDZ) removal from wastewater by persulfate activated with iron sulfate

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ABSTRACT

In this study, removal of an antibiotic (SDZ) from wastewater using an advanced oxidation process of persulfate (PS) in the presence of iron sulfate ($S_2O_8^{2-}/Fe^{+2}$) was investigated. The operational variables such as; the effect of pH, contact time, iron and PS ion concentrations and initial concentration of SDZ on the efficiency of SDZ removal was studied. High performance liquid chromatography (HPLC) was used for the analysis and monitoring of SDZ concentration. It was found that the highest rates of SDZ removal were found to be $95.83\pm 1.342\%$, $87.15\pm 0.929\%$ and $69.09\pm 0.848\%$, respectively, for initial SDZ concentration of 0.08, 0.2 and 0.4 mmol. The results showed that the $S_2O_8^{2-}/Fe^{+2}$ system would be optimized by contact time of 60 min, pH 4 and iron to PS molar ratio of 1. Therefore, these findings would help to better apply the AOPs to remove recalcitrance pollutants such as SDZ from wastewater.

Keywords: SDZ; Persulfate/iron process; Free radicals; Advanced oxidation process

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