Kinetic study on degradation of tylosin in aqueous media using potassium peroxydisulfate in the presence of immobilized nanosilver

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Received 22 April 2014; Accepted 6 November 2014

ABSTRACT

In the present research, the degradation of tylosin (TYL) by nano Ag/S2O82− process under various reaction conditions was investigated. The experiments were performed in a batch reactor, using nanosilver as a catalyst. Effects of pH, persulfate concentration, temperature, and catalytic nano Ag on the degradation efficiency of TYL by persulfate are examined. For treatment of solutions containing 50 mg/L of TYL, the optimum obtained conditions were: 0.4 g/L of nano Ag, 100 mM of the KPS, initial pH of 6.0, and temperature of 40°C. The degradation of TYL by nano Ag/S2O82− oxidation process has been found to follow the pseudo-first-order kinetic model. Finally rate equation for TYL degradation using Langmuir–Hinshelwood kinetic model is:

\[ r = 9630.5 \exp \left( -\frac{32.552}{RT} \right) C_0^{0.9925} \]

Keywords: Advanced oxidation processes (AOPs); Kinetics; Tylosin; Nanosilver; Peroxydisulfate