

عنوان مقاله:

Chemical Oxygen Demand Removal from Synthetic Wastewater Containing Non-beta Lactam Antibiotics Using Advanced Oxidation Processes: A Comparative Study

محل انتشار:

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خلاصه مقاله:

Background & Aims of the Study: Pharmaceuticals are considered as an emerging environmental problem due to their continuous discharge and persistence to the aquatic ecosystem even at low concentrations. The purpose of this research was the investigation of advanced oxidation processes (Fenton and Fenton-like) efficiency for the removal of non-beta lactam Antibiotics of azithromycin and clarithromycin from synthetic wastewater. **Materials & Methods:** In this laboratory scale study, samples of synthetic wastewater were prepared from azithromycin and clarithromycin antibiotics. Concentration of samples was 200 mg/L. Chemical oxygen demand (COD) index was selected as the parameter for evaluation in this study. Fenton and Fenton-like oxidation processes were done on synthetic wastewater of azithromycin and clarithromycin. In Fenton (Fe^{2+}/H_2O_2) and Fenton-like (Fe^0/H_2O_2) processes the influence of pH, iron and hydrogen peroxide on the removal efficiency of the antibiotics were studied and the optimum values for each parameter were determined. **Results:** The optimum condition for Fenton in removal of azithromycin and clarithromycin were pH= 7 and 7, Fe^{2+} 0.45 mmol/L and 0.45 mmol/L, hydrogen peroxide 0.16 mmol/L and 0.2 mmol/L, and contact time of 1 h and 1 h, respectively. The optimum condition for Fenton-like in removal of clarithromycin and azithromycin were pH= 7 and 7, Fe^0 0.3 mmol/L and 0.36 mmol/L, hydrogen peroxide 0.3 mmol/L and 0.38 mmol/L, contact time of 30 min and 30 min. **Conclusions:** The findings of this study demonstrate that the Fenton and Fenton-like processes under optimum conditions can play an important role in the removal of azithromycin and clarithromycin antibiotics from industrial wastewater.

کلمات کلیدی:

Azithromycin, Chemical oxygen demand, COD, Clarithromycin, Fenton, Fenton-like, Wastewater

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