

Catalytic Degradation of Tetracycline in Aqueous Solution by Magnetic Ore Pyrite Nanoparticles

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Abstract : This study presents the preparation, characterization and catalytic activity of a novel natural mineral-based catalyst for destructive adsorption of tetracycline (TTC) as water emerging compounds. Degradation potential of raw and calcined magnetite catalyst was evaluated at different experiments situations such as pH, catalyst dose, reaction time and pollutant concentration. Calcined magnetite attained greater catalytic potential than the raw ore in the degradation of tetracycline, around 69% versus 3% at reaction time of 30 min and TTC aqueous solution of 50 mg/L, respectively. Complete removal of TTC could be obtained using 2 g/L calcined nanoparticles at reaction time of 60 min. The removal of TTC increased with the increase in solution temperature. Accordingly, considering its abundance in nature together with its very high catalytic potential, calcined pyrite is a promising and reliable catalytic material for destructive decomposition for catalytic decomposition and mineralization of such pharmaceutical compounds as TTC in water and wastewater.

Keywords : catalytic degradation, tetracycline, pyrite, emerging pollutants

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