

عنوان مقاله:

Optimization, Kinetics, and Equilibrium Studies on the Removal of Beta-Lactam Antibiotics from Industrial Waste Water Using Functionalized Magnetic Multi-Walled Carbon Nanotube as a Novel Adsorbent

محل انتشار:

بیست و ششمین سمینار شیمی آلی ایران (سال: 1397)

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خلاصه مقاله:

In the recent years, residual antibiotics are considered to be nascent environmental pollutants due to their continuous input and persistence into the aquatic ecosystem even at low concentrations. Therefore, these are necessary to develop efficient methods for the waste water treatment [1-3]. The present study describes the efficiency of magnetic multi-walled carbon nanotubes (MMWCNT) for the adsorption of the selected beta-lactam antibiotics (penicillin G procaine, Amoxicillin trihydrate) from wastewater samples. The functionalized MMWCNT were characterized by Fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy (SEM). The obtained antibiotic percentage of sorption was evaluated by quantitative assessment using high-performance liquid chromatography (HPLC) coupled with the Ultraviolet Detector. In order to optimize the operating conditions, the effects of pH, Time contact, Agitation speed, adsorbent dosage, and antibiotics initial concentration were investigated by Taguchi experimental design method [1]. The data were fitted to the Pseudo first order kinetic, Pseudo second-order kinetic, Langmuir, Freundlich and Dubinin-Radushkevich (D-R) equation to establish the sorption kinetics and isotherms of antibiotics removal by MMWCNT [4]. The best percentages of removal were obtained for penicillin 90%, and amoxicillin 86.5%.

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