

Pollutants Removal from Synthetic Wastewater by the Combined Electrochemical Sequencing Batch Reactor

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Abstract : Synthetic domestic wastewater was treated via combining treatment methods, including electrochemical oxidation, adsorption, and sequencing batch reactor (SBR). In the upper part of the reactor, an anode and a cathode (Ti/RuO₂-IrO₂) were organized in parallel for the electrochemical oxidation procedure. Sodium sulfate (Na₂SO₄) with a concentration of 2.5 g/L was applied as the electrolyte. The voltage and current were fixed on 7.50 V and 0.40 A, respectively. Then, 15% working value of the reactor was filled by activated sludge, and 85% working value of the reactor was added with synthetic wastewater. Powdered cockleshell, 1.5 g/L, was added in the reactor to do ion-exchange. Response surface methodology was employed for statistical analysis. Reaction time (h) and pH were considered as independent factors. A total of 97.0% biochemical oxygen demand, 99.9% phosphorous and 88.6% cadmium were eliminated at the optimum reaction time (80.0 min) and pH (6.4).

Keywords : adsorption, electrochemical oxidation, metals, SBR

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