

عنوان مقاله:

Monopolar Electro-Coagulation Process for Azo Dye C.I. Acid Red 18 Removal from Aqueous Solutions

محل انتشار:

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خلاصه مقاله:

The discharge of wastewaters containing an untreated dye results in aesthetic problems and an increase in gases solubility, which causes light transmission inhibition into water bodies. In spite of advantages of physicochemical and biological methods, these processes produce huge amounts of sludge, toxic by-products and require several oxidant chemicals. By contrast, electrochemical processes because of their high versatility, high efficiency and eco-friendly properties are more acceptable. In the present study, the removal of azo dye Acid Red 18 and chemical oxygen demand (COD) from synthetic wastewater by monopolar (EC) process was investigated and key parameters such as operating time, current density (CD), initial pH and energy, and electrode consumption were optimized. It was found that the process had a very good efficiency in the removal of both COD and color; for the iron electrode, the maximum amounts of color and COD removal were 99.5% and 59.0%, respectively. An operating time of 45 min, pH of 7 and CD of 1.2 mA/cm² was selected as the optimized condition. The optimization of variables is extremely crucial as it results in a decrease in costs, energy and electrode consumption. Overall, the iron electrode used less energy than the aluminum electrode and was more acceptable for use in this process due to economical reasons. The findings of UV/vis spectra illustrated that the structures of this dye were removed by the process. In comparison with traditional methods such as aerobic and anaerobic systems, the EC process is a suitable alternative for the treatment of wastewaters containing dye pollutants.

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