Reactive Black 5 Removal with Electro-Oxidation Method using Ti/IrO₂/RuO₂ Anode and Stainless Steel Cathode

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In this study, the treatment of synthetic wastewater by electro-oxidation method was investigated. The experiments were performed in batch mode. As the anode material, Ti/IrO₂/RuO₂ sieve type anode material was used and stainless steel cathode plates were used as cathode material. The effects of experimental parameters such as initial dye concentration, pH, supporting electrolyte type, supporting electrolyte concentration and current density on the removal efficiency were investigated. NaCl, KCl, Na₂SO₄ and NaNO₃ as support electrolyte type were used. The obtained results showed that color removal optimal conditions are the following: initial pH of about 5, current density of 1.0 mA/cm² and supporting electrolyte of 5 mM NaCl. In the most favorable conditions, the dye removal is determined as 99.67%. It can be concluded that electro-oxidation process by Ti/IrO₂/RuO₂ electrode is very efficient and clean process for reactive dye removal from colored wastewater.

Keywords: Dye removal; Electro-oxidation; Steel cathode; Ti/IrO₂/RuO₂ anode

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