Electro-Fenton Degradation of High Concentration Rhodamine B on Nickel Foam Cathode Catalyzed by Cucumber Bio-Templated Fe₃O₄@PTFE

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Electro-Fenton technology has a great advantage in the treatment of high concentration refractory organic wastewater. In this paper, nickel foam was used as the cathode and cucumber bio-templated Fe₃O₄ was used as the catalyst to degrade rhodamine B by the electro-Fenton method. The active species in the degradation process were studied, and the degradation conditions were optimized. The results showed, compared with analytical reagent Fe₃O₄, the as-prepared cucumber bio-templated Fe₃O₄ has a larger specific surface area, a greater degradation efficiency, a higher concentration of generated •OH, and a lower concentration of generated H₂O₂. Hydroxyl radical is the active species during the electro-Fenton degradation. The degradation efficiency of 100 mg/L rhodamine B catalyzed by cucumber bio-templated Fe₃O₄ can reach 81.8% under the conditions of pH 3 and a current of 10 mA.

Keywords: electro-Fenton; Fe₃O₄; nickel foam; Rhodamine B; bio-templated.

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