Electrochemical degradation of diclofenac for pharmaceutical wastewater treatment

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Pharmaceutical compounds are potential bioactive chemicals in the environment, and their removal from water has aroused increasing concern. Novel electrochemical techniques have demonstrated potential application in the treatment of wastewater containing pharmaceuticals. In this study, the degradation of diclofenac in aqueous solution was carried out by an electrooxidation method with boron-doped diamond (BDD) and Ta/PbO₂ anodes. The influence of various operating parameters, such as the applied current density, temperature, initial concentration of diclofenac and pH value, on the degradation efficiency of diclofenac with the Ta/PbO₂ anode was systematically investigated. In comparison with the BDD anode, the Ta/PbO₂ anode possessed a higher oxidation rate and current efficiency.

Keywords: Electrochemical oxidation; Pharmaceutical wastewater; Ta/PbO₂; Removal; BDD

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