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Short Communication

Preparation of Nanostructured β-PbO_2 Films for the Electrochemical Oxidation of Acid Blue and Basic Brown Dyes

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In this study, PbO_2 electrodes incorporating a three-dimensional β-PbO_2 nanostructure coating were prepared by galvanostatic deposition using an aqueous lead(II) and methanesulfonic acid (CH_3SO_3H) bath. Simulated wastewater containing the Acid Blue (AB) and Basic Brown (BB) dyes was electrocatalytically degraded using the PbO_2 as the anode in an electrochemical cell containing various conducting electrolytes. Thoroughness for dye degradation was determined to mainly depend on the concentration and type of the conducting electrolyte used. The electrocatalytic activity was observed to reach a maximum value when using NaCl as electrolyte at a concentration of 2 g/L, indicating indirect oxidation of the test dyes, where chloride oxidation contributes to the electro-generation of hypochlorite ions.

Keywords: Nanostructured β-PbO_2; Electrochemical oxidation; Dyes; Acid blue; Basic brown

FULL TEXT