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Electrochemical oxidation of aspirin on PbO_2 electrode

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Abstract

The PbO_2-based electrode was obtained by electrodeposition on the titanium plate surface. The structure and morphology of PbO_2-based electrode samples obtained by deposition on the titanium plate surface using scanning electron microscopy and X-ray diffraction analysis were investigated. The surface of the titanium plate is covered with a continuous layer of lead dioxide. The study of the electrochemical oxidation of aspirin on a Ti/PbO_2 electrode was carried out using cyclic and linear voltammetry. The oxidation of aspirin molecules on Ti/PbO_2 electrode occurs at high potentials with the maximum current at 2.0 V. It has been shown that the concentration has practically no effect to the rate of the process of electrochemical oxidation aspirin. The effect of the current density top the efficiency of electrochemical oxidation of aspirin on is studied. The maximum degree of aqueous aspirin solutions purification is observed at a current density of 0.3 A/cm^2. With an increase in the current density from 0.01 to 0.3 A/cm^2, the degree of aspirin solution purification increases almost in a straight line, from 81 to 98%. The characterization of aspirin solutions before and after electrolysis was carried out using the UV-Vis absorption spectrometry. After electrolysis for two hours, the aspirin in solution is absent, which is expressed by a decrease in absorption on spectra at the 330 nm. During electrolysis within 2 hours, the absorption peak disappears almost completely, which is associated with the complete oxidation of aspirin molecules.

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