

Study of the Kinetic of the Reduction of Alpha and Beta PbO₂ in H₂SO₄ on the Microcavity Electrode

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Abstract : The aim of our work is the contribution to the improvement of the performances of the positive plate of the lead acid battery. For that, we synthesized two varieties of PbO₂ used in industry, alpha and beta PbO₂ by electrochemical way starting from the not formed industrial plates. We studied the kinetics of reduction of the alpha varieties and PbO₂ beta on electrode with microcavity in sulphuric medium. The electrochemical study of the powders of α and β -PbO₂ was made by cyclic voltamperometry with sweeping of potential by using a traditional assembly with three electrodes. Values of the coefficient of diffusion of the proton in α and β -PbO₂ are respectively equal to $0.498 \cdot 10^{-8} \text{ cm}^2 / \text{ s}$ and $0.793 \cdot 10^{-8} \text{ cm}^2 / \text{ s}$. During the cycling of the two varieties of PbO₂, we obtain a clear increase in the capacity.

Keywords : lead accumulator, α and β - PbO₂, synthesis, kinetics, cyclic voltametry, coefficient of diffusion

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