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

Authors : N. Chahmana, I. Zerroual

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*10-8cm2 /s and 0.793*10-8 cm2 /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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