

Electrochemical and Raman studies on the redox switching hysteresis of polyaniline.

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Cyclic voltammetry (CV), impedance spectroscopy, and Raman spectroscopy were used to characterize the redox switching hysteresis of polyaniline (PANI) in aqueous acid solutions. The polymer was prepared electrochemically. Polyaniline with various counterions: chloride, trichloroacetate, perchlorate, was studied. It was found that the hysteresis of the switching process depends on the electrolyte used for a switching performance. It increases in the order: trichloroacetic acid, perchloric acid, hydrochloric acid. The hysteresis is determined by the counterion used in the switching performance and it seems to be not dependent on a counterion history of the polymer. Effective charge diffusion coefficients follow changes in the basicity of the counterion. Raman spectra of the primary counterion–polyaniline differ for the chloride and perchlorate counterions. Raman spectroscopy reveals a stronger interaction with the secondary counterion in the polyaniline–perchlorate system than in the polyaniline–trichloroacetate system.

Słowa kluczowe

Polyaniline, Hysteresis, Diffusion coefficients, Raman spectroscopy

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