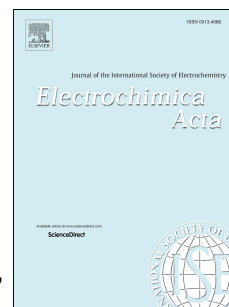


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Influence of dipping cycle on SILAR synthesized NiO thin film for improved electrochemical performance

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Abstract

NiO thin films have been successfully synthesized using by successive ionic layer absorption and reaction (SILAR) technique which is simple, cost-effective and low-temperature wet chemical process. Influences of deposition cycle on structural and morphological property were investigated using XRD and FESEM. Surface morphological study shows formation of highly porous network which provides more active sites and deposition path for electrolyte ions. NiO thin film based electrode provides highest specific capacitance of 1341 Fg^{-1} at the voltage scan rate of 2 mVs^{-1} for the film deposited at 40 deposition cycle. From charging -discharging curve of NiO electrode, specific capacitance value of 877 Fg^{-1} at current 1 Ag^{-1} for the film deposited at 40 deposition cycle was observed. It shows highest specific energy of 64.8 Wh Kg^{-1} . The NiO electrode exhibited long-term cycle stability with 90% capacitance retention after 1000 cycle. Such attractive electrochemical performance of the formed electrode is suitable for the manufacturing of the good quality supercapacitors for commercial application.

Keywords: Cyclic voltammetry; GCD; impedance analysis; NiO thin film; SILAR.

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