

## Electrodeposition of NiO Films from Organic Solvent-Based Electrolytic Solutions for Solar Cell Application

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**Abstract :** The preparation of semiconductor oxide layers and structures by soft techniques is an important field of research. Higher performances are expected from the optimizing of the oxide films and then use of new methods of preparation for a better control of their chemical, morphological, electrical and optical properties. We present the preparation of NiO by electrodeposition from pure polar aprotic medium and mixtures with water. The effect of the solvent, of the electrochemical deposition parameters and post-deposition annealing treatment on the structural, morphological and optical properties of the films is investigated. We remarkably show that the solvent is inserted in the deposited layer and act as a blowing agent, giving rise to mesoporous films after elimination by thermal annealing. These layers of p-type oxide have been successfully used, after sensitization by a dye, in p-type dye-sensitized solar cells. The effects of the solvent on the layer properties and the application of these layers in p-type dye-sensitized solar cells are described.

**Keywords :** NiO, layer, p-type sensitized solar cells, electrodeposition

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