## Electrochromic Properties of Sol-Gel NiO Films

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**Abstract:**

Electrochromic films of NiO & NiO-$TiO_2$ (with Ti concentrations 5, 10, 15, 20, 25 & 30%) have been prepared by the sol-gel route using dip coating technique onto fluorine-doped tin oxide-coated glass substrates (FTO/glass). Ethanolic sols from nickel acetate tetrahydrate ($Ni(CH_3COO)_2 \cdot 4H_2O$) and titanium isopropoxide precursors were used in the preparationsd. The nano-sized films were sintered in air between 250 and 300°C. Characteristics of different films were studied in a comparative manner. Photoluminescence spectra, UV/Visible spectra, electrochromic behavior, cyclic voltammetry, XRD and SEM have been investigated.

Typically, as the $TiO_2$ content was increased, film characteristics were enhanced. Then mechanisms of coloration and morphology transformation of the layer during cycling in 0.05 M KOH electrolyte are discussed in terms of an activation and degradation period. Finally, a used type of electrolyte based on KOH mixed with starch has been also tested with complete windows.

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