

Electrochromic nickel oxide thin films

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ABSTRACT

The electrochromic composite nickel oxide/polyaniline (PANI) thin films with electronic conductivity (~ 1000 S/m) were prepared by a new peroxo sol-gel route from Ni-acetate precursor, hydrogen peroxide and aniline. Thin xerogel films were deposited from deep green colloidal solutions by dip-coating technique on FTO/glass substrates and heat treated around 200 °C in air stream. The electrochromic properties of the gray nickel oxide films were tested in 1 M LiClO₄/propylene carbonate electrolyte. In-situ UV-visible spectroelectrochemical measurements showed sufficiently high charge capacities ($> \pm 10$ mC/cm²) and colouring/bleaching changes ($\Delta T \sim 20 - 30$ %, gray to transparent) enabling the preparation of electrochromic devices consisting of anodic composite nickel oxide counter electrode, cathodic WO₃ electrochromic layer and semi-solid gel electrolyte. The comparison of composite nickel oxide/PANI films to nickel oxide films prepared by standard peroxo route^[1] will also be done.

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REFERENCES

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