

Comparison of Electrochromic Nickel Oxide/Hydroxide Deposition by RF Sputtering and Sol-Gel Coating

Jin –Young Park, Kwang-Soon Ahn, Yoon-Chae Nah, Tae-
Young Lim *, and Yung-Eun Sung

Department of Materials Science & Engineering
Kwangju Institute of Science and Technology
Gwangju, 500-712, S. Korea

* Ceramics & Building Materials Department
Korea Institute of Ceramic Eng. & Tech., Seoul, 153-
801, S. Korea

Reference

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An electrochromic device is able to change its optical properties when a voltage is applied across it. An EC device generally consists of a transparent electrically conducting layer, electrochromic cathodic and anodic coloring materials, and an ion conducting electrolyte.

Nickel oxide/hydroxide has known as promising anodic materials for electrochromic devices. In this study, the nickel oxide/hydroxide films are prepared by various techniques. The EC layers were usually prepared by RF magnetron sputtering, and by a sol-gel deposition method, which is a deposition method that synthesize the nickel oxide/hydroxide at low temperature. Our group has previously reported on the EC properties of the EC layers deposited by the RF sputtering method[1,2]. This method has various advantages with respect to uniformity and reproducibility of the films but disadvantages of higher cost than the sol-gel coating method. Also, it can provide more porous films. Therefore, the Ni oxide/hydroxide films were prepared by the sol-gel method. The EC properties of the Ni oxide/hydroxide deposited by RF magnetron sputtering and sol-gel method were then compared.

The electronic and micro-structural properties of nickel oxide/hydroxide films were investigated by X-Ray Diffraction(XRD), atomic force microscopy(AFM), and scanning electro microscopy(SEM). And *in-situ* transmittance measurement When the potential cycling were performed in liquid electrolyte.