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研究论文

钴掺杂对氧化镍薄膜电致变色性能的影响

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摘要: 采用恒电位法在FTO玻璃上沉积Co与Ni摩尔比为0.16:1的薄膜, 用X射线衍射仪、扫描电镜和能谱仪分析了膜的成分、结构和形貌, 用紫外--可见分光光度计表征了膜的透光性能, 用循环伏安法表征了膜的电化学稳定性和可逆性, 用双电位阶跃法表征了膜的开关响应时间, 研究了钴掺杂对氧化镍薄膜电致变色性能的影响。结果表明, 钴掺杂使NiO薄膜颗粒更加细小和均匀, 提高了薄膜在可见光波段着色态与消色态之间的透光率差值, 降低了电致变色反应的工作电压, 有利于薄膜在电致变色过程的可逆性, 缩短了着色响应时间。

关键词: 无机非金属材料 电致变色 钴掺杂氧化镍薄膜 可逆性

Effect of Co on the Electrochromic Properties of NiO Film

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Abstract: The film of Co/Ni molar ratio of 0.16:1 was electrode posited on FTO glass by potentiostatic technique. XRD, SEM and EDS were employed to analyze the morphology composition, structure of the film; Uhraviolet-visible transmission spectroscopy was applied to measure transmittance of the films. Cyclic voltammetry was used to characterize the electrochemical stability and reversibility of the film. And switch response time was measured by double potential step technique. The Effect of Co on the electrochromic properties of NiO film was investigated. The results show that Co can make the particles of NiO film tiny and even, raise visible light transmittance difference between bleached and colored states, lower the working voltage of eleetroehromic reaction, improve eleetroehromic reversibility and shorten the time of colored processes.

Keywords: inorganic non-metallic materials electrochromic Co-doped NiO film reversibility

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