

研究论文

## 热处理对WO<sub>3</sub>纳米薄膜结构及其气致变色性能的影响

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**摘要** 以钨粉和过氧化氢溶液为原料, 采用溶胶凝胶法制备了WO<sub>3</sub>溶胶, 并结合提拉镀膜法, 分别在普通玻璃载玻片和抛光硅片上制备了掺钽气致变色WO<sub>3</sub>纳米结构薄膜; 并分别在50, 150, 250, 350和450 °C的空气氛围中对薄膜进行了热处理. 采用IR、双椭圆偏振光谱仪、AFM和XRD分析了薄膜的性质和微观结构, 观察了薄膜的表面形貌, 根据所得数据讨论了不同热处理温度对薄膜的结构和气致变色性能的影响.

**关键词** [WO<sub>3</sub>薄膜](#) [热处理温度](#) [气致变色](#)

**分类号** [0648.2](#)

## Effect of Annealing Temperature on Structure and Gaschromic Properties of WO<sub>3</sub> Thin Films

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**Abstract** WO<sub>3</sub> sol(600 mL) was prepared with tungsten powder and 37% H<sub>2</sub>O<sub>2</sub> through the sol-gel method in this paper. WO<sub>3</sub> thin films were prepared on silicon chips and ordinary slide glasses *via* Dip Master method and annealed in ambient air at temperatures of 50, 150, 250, 350 and 450 °C, respectively. Thickness and refractive index of the WO<sub>3</sub> thin films were researched by Spectroscopic Ellipsometer. Surface morphology and microstructure of the films were analyzed with AFM, IR and XRD respectively. The annealing temperature have an important effect on the structure and gaschromic properties of WO<sub>3</sub> thin films. At low annealing temperature, WO<sub>3</sub> thin films is amorphous and porous structure, and the water of WO<sub>3</sub> thin films is appropriate, then this kind of WO<sub>3</sub> thin films have a good gaschromic properties.

**Key words** [WO<sub>3</sub> thin Films](#) [Annealing temperature](#) [Gaschromic](#)

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