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摘要：采用电化学阳极氧化法制备高度有序的TiO<sub>2</sub>纳米管阵列。样品分别在300℃、400℃、500℃和600℃条件下煅烧。TiO<sub>2</sub>纳米管的结构和形貌由X射线衍射仪（XRD）和场发射扫描电镜（FESEM）进行表征。用TiO<sub>2</sub>纳米管阵列设计一种新型的传感器来考察其湿敏特性。600℃条件下煅烧的样品在11%~95%相对湿度（RH）范围内表现出比较高的灵敏度，在电阻上有两个数量级的变化，并且响应和恢复时间比较短（<190s）。

关键词：二氧化钛纳米管, 阳极氧化, 湿度传感器, 薄膜

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### Humidity sensing properties of TiO<sub>2</sub> nanotubes arrays

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Abstract: The highly ordered TiO<sub>2</sub> nanotubes arrays are prepared by electrochemical anodic oxidation. The samples are calcined at 300℃, 400℃, 500℃ and 600℃ respectively. The structure and the morphology of the TiO<sub>2</sub> nanotubes are analyzed by X-ray diffraction (XRD) and field emission scanning electron microscopy (FESEM). We design a novel sensor with the TiO<sub>2</sub> nanotubes films to investigate the humidity sensing behaviours. The samples calcined at 600℃ show high sensitivity with nearly two orders change in the resistance and short response and recovery time (<190s) during the relative humidity variation from 11% to 95%.

Key words: Titania nanotubes, Anodization, Humidity sensor, Thin film

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