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结构材料及核材料性能

Pd掺杂SnO_2纳米结构传感器制备与氢敏性能研究

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摘要 以$SnCl_4$•$5H_2O$和$PdCl_2$为原料，通过雾化热解方法制备原位Pd掺杂SnO_2多孔纳米结构粉体，并通过涂覆形成薄膜传感器。利用XRD、FE-SEM对样品的结构和形貌进行表征，通过BET测定样品的孔径分布及比表面积。氢敏测试结果表明，Pd掺杂的SnO_2薄膜气敏材料在低于150 ℃的操作温度下对质量浓度为10-4量级的H_2显示出良好的气敏响应特性，这可能归因于粉体的多孔结构和Pd掺杂剂的催化效应。

关键词 雾化热解；多孔SnO_2；Pd掺杂；氢敏测试

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Preparation and Hydrogen Sensitivity of Pd Doped SnO_2 Nanostructured Gas Sensor

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Abstract Porous SnO_2 nanostructured film gas sensor was fabricated by spray pyrolysis route using tin chloride pentahydrate ($SnCl_4$•$5H_2O$) and $PdCl_2$ dopant as starting material. The phase, morphology and porous microstructure of the samples were characterized by XRD, FE-SEM and BET, respectively. Hydrogen sensitivity test reveals that the nanostructured gas sensor processes rapid response in 10^{-4} concentration of H_2 at temperature below 150 ℃, and the phenomenon can be attributed to pore structure and the improvement of gas absorption and catalytic effect of Pd dopant.

Key words spray pyrolysis _ porous SnO_2 _ palladium _ hydrogen sensitivity test

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