

基于La_{0.9}Sr_{0.1}Ga_{0.8}Mg_{0.2}O_{3-δ}固体电解质的电流型NO₂传感器敏感特性的研究

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摘要：

采用丝网印刷技术制备了以La_{0.9}Sr_{0.1}Ga_{0.8}Mg_{0.2}O_{3-δ}(LSGM)为固体电解质、NiO为敏感电极(SE)材料的电流型NO₂传感器。用X射线衍射仪和扫描电镜对该传感器进行了理化分析；通过测量其在不同温度和不同NO₂浓度气氛中的I-V曲线和时间响应曲线对传感器的电流输出信号和NO₂浓度的关系以及时间响应特性进行了研究。结果显示：在400~650℃测试温度范围内，传感器响应电流的变化幅度和NO₂浓度之间存在较好的线性关系，且响应和恢复时间分别为50s和90s左右。传感器的稳定性测试结果表明：传感器样品的响应电流幅值出现了一定程度的下降，稳定性有待进一步提高。

关键词：NO₂传感器；LSGM；I-V特性；响应时间；稳定性

Research on The Sensing Characteristics of Amperometric NO₂ Sensor Based on La_{0.9}Sr_{0.1}Ga_{0.8}Mg_{0.2}O_{3-δ}

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Abstract:

Amperometric NO₂ Sensor Based on La_{0.9}Sr_{0.1}Ga_{0.8}Mg_{0.2}O_{3-δ}(LSGM) with NiO sensing electrode was prepared by screen-printing technique. The physical characteristics of the sensor were studied by the X-ray diffraction and scanning electron microscope, and the characteristics of current and response/recovery time of the sensor were tested under different NO₂ concentrations and temperatures. The results show that, at the range of 400~650℃, a good linear relationship between the variation of the current change ΔI and NO₂ concentration is achieved for the sensor, and the response/recovery time of the sensor are 50s and 90s, respectively. The stability-testing results show that, the response current amplitude of the sensor decreased to some extent, and the stability of the sensor needs to be further improved.

Keywords: NO₂ sensor; LSGM; I-V characteristics; response/recovery time; stability

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