

研究论文

Al掺杂 α -Fe₂O₃材料的制备、表征和气敏特性

司书峰, 杨松林, 延玺

北京师范大学化学系, 北京 100875

收稿日期 2007-1-29 修回日期 网络版发布日期 2007-11-10 接受日期

摘要 采用均相沉淀法制备了纯 α -Fe₂O₃ (300 °C煅烧)和Al掺杂 α -Fe₂O₃ (300和400 °C煅烧), 使用SEM, XRD, ICP和红外光谱等手段进行表征, 并利用气敏仪测试无水乙醇和90#汽油在不同条件下对材料的响应性能. 结果表明, 微量Al掺杂不改变 α -Fe₂O₃材料的物相, 但会阻碍晶粒生长, 使颗粒变小及Fe₂O₃晶格间隙中的铁原子数目增多, 材料的导电率增大, 从而显著提高材料的气敏性能. Al掺杂 α -Fe₂O₃对乙醇的响应性能优于对汽油的响应性能, 在乙醇气氛中, 材料对湿度仍然不敏感. 经400 °C煅烧的Al掺杂 α -Fe₂O₃稳定性较好, 可作为检测乙醇气体的半导体气敏材料.

关键词 [Al掺杂](#) [\$\alpha\$ -Fe₂O₃](#) [气体传感器](#) [可燃气体](#)

分类号 [0611](#)

Preparation, Characterization and Gas Responsibilities of Al Doped α -Fe₂O₃

SI Shu-Feng*, YANG Song-Lin, YAN Xi

Department of Chemistry, Beijing Normal University, Beijing 100875, China

Abstract Pure and Al doped α -Fe₂O₃ materials were prepared by a solution phase controlled by hydrolysis method, and were characterized by XRD, SEM and ICP techniques. Gas-sensing properties were carried out on gas sensors from these materials under laboratory and humid conditions. The experiments indicate that the crystalline size of Al doped α -Fe₂O₃ materials is less than that of pure one, and their conductivity increases obviously; the resultant Al doped Fe₂O₃ gas sensor exhibits a high response and a short response/recovery time in the detection of low concentrations of various combustible gases. The Al doped Fe₂O₃ sintered at 400 °C, which is more stable than one sintered at 300 °C, is suitable as a gas sensor for ethanol alcohol.

Key words [Al doped](#) [\$\alpha\$ -Fe₂O₃](#) [Gas sensor](#) [Combustible gas](#)

DOI:

通讯作者 司书峰 sishf@bnu.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(1400KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“Al掺杂”的 相关文章](#)

▶ 本文作者相关文章

· [司书峰](#)

· [杨松林](#)

· [延玺](#)