

研究论文

聚-3,4-乙烯二氧噻吩导电聚合物纳米粒子的制备及性能

杨亚杰, 蒋亚东, 徐建华, 应智花

电子科技大学光电信息学院, 电子薄膜与集成器件国家重点实验室, 成都 610054

收稿日期 2006-12-19 修回日期 网络版发布日期 2007-10-24 接受日期

摘要 采用反向胶束合成法, 以二乙基磺基琥珀酸钠(AOT)形成的反胶束为模板制备了导电聚合物聚-3,4-乙烯二氧噻吩(PEDOT)纳米粒子. 用紫外-可见-近红外光谱、红外光谱、X射线光电子能谱、扫描电子显微镜及透射电镜等手段对PEDOT粒子进行了表征. 研究了纳米粒子的导电性能并采用石英微天平(QCM)对纳米粒子的气敏特性进行了分析, 对相应导电机理及气体敏感机理进行了讨论.

关键词 [反胶束](#) [聚-3,4-乙烯二氧噻吩](#) [导电聚合物](#) [纳米粒子](#) [气敏性能](#)

分类号 [O647.2](#)

Preparation and Properties of Conducting Polymer Poly(3,4-ethylenedioxythiophene) Nanoparticles

YANG Ya-Jie, JIANG Ya-Dong*, XU Jian-Hua, YING Zhi-Hua

State Key Laboratory of Electronic Thin Films & Integrated Devices, School of Optoelectronic Information, University of Electronic Science and Technology of China, Chengdu 610054, China

Abstract Poly(3,4-ethylene dioxythiophene)(PEDOT) nanoparticles was prepared by reverse micelles technique. The nanoparticles were characterized by UV-Vis-near IR(UV-Vis-NIR) adsorption spectrum, IR spectrum, X-ray photoelectron(XPS), scanning electron microscopy(SEM) and transmission electron microscopy(TEM). The results confirmed that size distribution of this particle was 30—40 nm and the nanoparticles has been doped by Cl⁻ during synthesis process. The conductivity of nanoparticles was investigated by four-probe and it has been found that this nanoparticles showed higher conductivity(10.2 S/cm)than conventional one. Furthermore, the gas sensitivity of nanoparticles deposited on quartz crystal microbalance(QCM) was studied and the nanoparticles deposited device exhibited excellent sensitivity to NH₃ gas at low concentration. The mechanism of conductivity and gas sensitivity of the nanoparticles are also included in this paper.

Key words [Reverse micelle](#) [PEDOT](#) [Conducting polymer](#) [Nanoparticle](#) [Gas sensitivity](#)

DOI:

通讯作者 蒋亚东 jj_eagle@163.com

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(423KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [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“反胶束”的 相关文章](#)

▶ 本文作者相关文章

- [杨亚杰](#)
- [蒋亚东](#)
- [徐建华](#)
- [应智花](#)