

论文

纳米镍/炭复合材料的制备与磁性表征

赵军, 周伟良, 徐复铭, 巩丽

(南京理工大学化工学院, 南京 210094)

收稿日期 2005-7-21 修回日期 2005-10-24 网络版发布日期 2006-4-25 接受日期

摘要 以废弱酸型聚丙烯酸系阳离子交换树脂为炭前驱体, 经过与镍离子交换后, 再经热解制备纳米镍粒子均匀分散于炭基体的纳米镍/炭(Ni/C)复合材料。以XRD、TEM为主要分析手段研究了热解条件对纳米镍粒子在Ni/C复合材料中的形貌、大小的影响。结果表明: 通过热解条件可以控制Ni/C复合材料中纳米镍粒子的平均粒径; 热解温度的升高和热解保温时间的增加都可使Ni/C中纳米镍粒径增大。磁性能测试结果表明: Ni/C-500表现为超顺磁特性, 而Ni/C-600、Ni/C-700为铁磁性; Ni/C-600、Ni/C-700的比剩磁强度、矫顽力都要大于微米镍粉与块体镍, 但其比饱和磁化强度要小于微米镍粉和块体镍。

关键词 [复合材料](#) [纳米镍](#) [炭材料](#) [磁性材料](#)

分类号 [TB333](#) [TB383](#)

## Preparation and magnetic behavior of nano-Ni/C composite material

ZHAO Jun, ZHOU Wei-liang, XU Fu-ming, GONG Li

(School of Chemical Engineering, Nanjing University of Science and Technology, Nanjing 210094, China)

**Abstract** A kind of Ni/C composite material, in which nano nickel particles were uniformly distributed in carbon matrix, was prepared by pyrolysis of Ni-exchanged cation exchange resin (Ni-PAA). The effect of pyrolytic conditions on the morphology, size of nano nickel particles in Ni/C composite material was studied by means of X-ray diffraction (XRD), Transmission Electron Microscope (TEM). The results show the particle size of nano nickel in Ni/C can be controlled by pyrolytic conditions; the particle size increases as the pyrolytic temperature and the holding time increase. Magnetic tests show that Ni/C-500 is superparamagnetic, while Ni/C-600, Ni/C-700 are ferromagnetic. The remanence and the coercivity at room temperature of Ni/C-600 and Ni/C-700 are higher than those of the corresponding micrometer nickel powders and bulk nickel, while the saturation magnetization is lower than those of micrometer nickel powders and bulk nickel.

**Key words** [composite material](#) [nano nickel](#) [carbon material](#) [magnetic material](#)

DOI:

通讯作者 赵军

### 扩展功能

#### 本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(0KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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“复合材料”的相关文章](#)

▶ [本文作者相关文章](#)

- [赵军](#)
- [周伟良](#)
- [徐复铭](#)
- [巩丽](#)