

材料科学与工程

电纺法制备聚丙烯腈基纳米碳纤维

史铁钧¹; 廖若谷¹; 王鹏²

合肥工业大学化工学院¹

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摘要 用电纺法制备了聚丙烯腈(PAN)纳米纤维,用场发射扫描电镜(FESEM)对其形态进行了研究,讨论了不同工艺参数对纤维直径和分散形态的影响。结果发现,纤维直径随着浓度的增加而增大,随着电压升高而减小,接收距离和溶剂类型对纤维直径的影响不大。将形态最好的纤维在240℃下进行活化处理,然后将活化处理过的纤维在氮气气氛中煅烧,用FESEM观察了煅烧的纤维直径及形态的变化,红外(IR)分析了纤维化学结构的变化,证实了经900℃煅烧后的纤维为碳纳米纤维。

关键词 [电纺](#); [聚丙烯腈](#); [场发射扫描电镜](#); [纳米碳纤维](#)

分类号

Fabrication of carbon nanofiber based on polyacrylonitrile by electrospinning

Abstract

Fibers of polyacrylonitrile (PAN) were fabricated by means of electrospinning. The morphology of the PAN fibers was investigated with Field Emission Scanning Electron Microscope (FESEM). The effects of electrospinning technology parameters on the diameter and morphology of the PAN fibers were discussed in detail. It was found that the diameter of the fiber increased with increasing solution concentration and with decreasing electrospinning voltage, but the distance from tip to target and solvent type had little effect on fiber diameter. The fibers that had the best morphology were calcined at 240°C in air and then calcined in nitrogen at a higher temperature. The changes of diameter and morphology of the fiber were also observed by means of FESEM. The chemical structure of the fibers was analyzed by IR, and it was confirmed that the fibers calcined at 900°C were carbon nanofiber.

Key words [electrospinning](#); [polyacrylonitrile](#); [FESEM](#); [carbon nanofiber](#)

DOI:

通讯作者 史铁钧 lotusrain2000@sina.com

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