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研究简报

聚苯胺纳米线电导率的尺寸效应

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摘要 在前期工作的基础上, 利用导电原子力显微镜法测量单根聚苯胺纳米线的电导率, 探讨了聚苯胺纳米线(PANI nanowine)电导率的尺寸效应, 发现尺寸效应与纳米线的有序性有关.

关键词 阴离子表面活性剂 聚苯胺纳米线 导电原子力显微镜 电导率

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Size Effect of Conductivities of Polyaniline Nanowires

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Abstract The study of size effect of conductivity of conducting polymer nanowires can be significant not only in the instruction of fabrication of the devices with nanodimension but also in basic research of inherence of nanomaterials. PANI nanowires was fabricated in AAO templates by potentiostatic method. A new strategy of chemical modification of AAO template was introduced to prepare nanowires with smaller diameter. FTIR and contact angle measurements were used to characterize the modification. Tunneling Electron Microscopy results showed that the smaller PANI nanowires in diameter can be obtained in surfactant modified AAO templates. Conductivity of single PANI nanowire had been measured by Conductive Atomic Force Microscopy. The results displayed that the conductivity of PANI nanowire increase while the decrease of the diameter of PANI nanowires, which was called size effect of conductivity of PANI nanowires. The size effect had been attributed to order polymer chains orientation of PANI nanowire, which had been confirmed by electron diffraction diagrams.

Key words Anion surfactant PANI nanowire Conductive atomic force microscopy Conductivity

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