

论文

以DNA为模板构造苯胺-DNA复合物纳米线和聚苯胺纳米导线

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摘要:

在溶液中, 以DNA为模板构造出了线性的苯胺-DNA复合物纳米线. 用压缩气流将得到的复合物纳米线拉直并固定到云母基底上. 用原子力显微镜(AFM)可观察到形貌规整的苯胺-DNA复合物纳米线. 苯胺单体在溶液中能从各个方向上组装到DNA分子上, 从而使DNA模板分子的表面包裹了一层苯胺. 以苯胺-DNA复合物纳米线为前驱体通过进一步化学氧化聚合得到了以DNA为模板的聚苯胺纳米导线.

关键词: DNA模板 聚苯胺 纳米导线 原子力显微镜

Fabrication of Linear Aniline-DNA Complex Nanowires and DNA-templated Polyaniline Nanowires

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Abstract:

In the present work, we developed a simple method for fabricating conducting polymer nanowires and characterized the resulted nanostructures mainly by atomic force microscopy(AFM). With DNA as templates, aniline-DNA complex nanowires were first produced in solution via a self-assembled process in which aniline monomers assembled on the entire DNA molecule surface from any direction. Compressed gas flow was then used to stretch the obtained aniline-DNA complex nanowires onto mica substrate. The linear aniline-DNA complex nanowire arrays can be directly observed from the AFM images. Finally, we got the polyaniline(PAn) nanowires based on the precursor of aniline-DNA complex nanowires through further chemical oxidative polymerization. The aniline-DNA complex nanowires and the polyaniline(PAn-DNA) nanowires both exhibit a low background on the unmodified mica substrates. This strategy can be adopted for constructing other conducting polymer nanowires.

Keywords: DNA-template Polyaniline Nanowire AFM

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