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#### 器件制备及器件物理

#### 溶液法制备有机薄膜晶体管碳纳米管电极

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**摘要:** 采用十二烷基磺酸钠(SDS)和聚(3,4-乙撑二噻吩)/聚苯乙烯磺酸盐(PEDOT/PSS)做分散剂制备了分散性能良好的多壁碳纳米管溶液,借助聚二甲基硅氧烷(PDMS)在硅片表面形成亲水疏水区域,采用溶液法制备了图案化的碳纳米管薄膜电极。应用图案化碳纳米管电极制作聚(3-己基噻吩)有机薄膜晶体管,以 SDS和PEDOT/PSS为分散剂获得的器件迁移率分别为 $0.01 \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ 和 $0.0075 \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ 。开关电流比均为 $3 \times 10^3$ 。

**关键词:** 多壁碳纳米管 溶液法 有机薄膜晶体管 电极 图案化

#### Solution Based Fabrication of Carbon Nanotube Electrode for Organic Thin Film Transistor

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**Abstract:** Multi-walled carbon nanotube solution was prepared by using sodium dodecyl sulfonate(SDS) and poly(3,4-ethylenedioxythiophene) polymerized with poly(styrenesulfonate)(PEDOT/PSS) as dispersers. Polydimethylsiloxane(PDMS) was used to make the silicon wafer hydrophilic or hydrophobic. Carbon nanotube thin film electrode can be made using drop-casting method on the patterned silicon wafer. The patterned electrode was used in the organic thin film transistors. The field-effect mobility of the devices using SDS and PEDOT/PSS as dispersers are  $0.01 \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$  and  $0.0075 \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ , respectively, both the  $I_{\text{on}}/I_{\text{off}}$  ratio are  $3 \times 10^3$ .

**Keywords:** multi-walled carbon nanotube solution based fabrication organic thin film transistors(OTFT) electrode pattern

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