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论文

电泳沉积法制备介孔TiO₂/单壁碳纳米管薄膜

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摘要:

采用电泳沉积法, 在FTO/介孔TiO₂薄膜上制备了介孔TiO₂/单壁碳纳米管(SWCNTs)薄膜电极, 用Raman和SEM等手段对薄膜电极进行了表征. 结果表明, SWCNTs已沉积到介孔TiO₂薄膜上. 分别用四羧基苯基卟啉(TCPP)和联吡啶钌化合物N719对其进行敏化, 并组装成太阳能电池. 研究表明, 与单纯的TiO₂粒子膜相比, 介孔TiO₂和SWCNTs的紧密结合可使得光生电子更容易传输, 光电转换效率显著提高.

关键词: 介孔TiO₂; 单壁碳纳米管; 电泳沉积; 染料敏化太阳能电池

Preparation of Mesoporous TiO₂/Single Wall Carbon Nanotubes Thin Film Through Electrophoretic Deposition

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Abstract:

Mesoporous TiO₂/SWCNTs thin films were successfully prepared through electrophoretic deposition method on FTO/meso-TiO₂ substrate. The products were characterized by Raman and SEM. The results reveal that SWCNTs are successfully deposited on the surface of mesoporous TiO₂ thin film. The dye-sensitized solar cells are assembled with the films and they are sensitized by TCPP and N719, respectively. The results show that they exhibit enhanced power conversion efficiency. This maybe attribute to the compact contact of mesoporous TiO₂ and SWCNTs in favor of the transportation of photogenerating electrons.

Keywords: Mesoporous TiO₂; Single wall carbon nanotube; Electrophoretic deposition; DSSC

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