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摘要:

利用压电喷墨印刷技术沉积了PEDOT/PSS有机导电薄膜,研究了退火温度和乙二醇掺杂对薄膜导电性能的影响。实验结果表明:未退火温度为120,140,160 °C时,薄膜表面平均粗糙度分别为8.15,4.10,3.36,2.66 nm;乙二醇掺杂使导电激活能由未掺杂时的0.096 eV到0.046 eV;导电激活能减小表明PEDOT分子链从低电导率的卷曲构象向高电导率的伸展构象转变;此外,乙二醇掺杂促使PSS与PEDOT离,使团聚的PEDOT/PSS颗粒变小从而分散更均匀,降低了表面粗糙度。

关键词: PEDOT/PSS 喷墨印刷 导电聚合物薄膜 导电性能

Conductive Properties of PEDOT/PSS Films Deposited by Ink-Jet Printing

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Abstract:

Conducting polymer PEDOT/PSS films were deposited utilizing piezoelectric ink-jet printing technology. The effect of annealing temperature, ethylene glycol doped on conductive properties of the films was studied. The results show that the average surface roughness of films when no annealing and annealing at 120, 140, 160 °C were 8.15, 4.10, 3.36, 2.66 nm, respectively; ethylene glycol doped reduces the conductive activation energy of the film from 0.096 eV (no doping) to 0.046 eV. The decrease of the conductivity activation energy suggests that the PEDOT chain turns from coil conformation of low conductivity into the expanded-coil conformation of high conductivity. In addition, the addition of ethylene glycol reduces the surface roughness of the films due to PSS separated from PEDOT/PSS and then the PEDOT/PSS particles become smaller and more evenly dispersed.

Keywords: PEDOT/PSS inkjet printing conducting polymer film conductive properties

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