

论文

基底材料对脉冲电流法制备的聚苯胺膜性能的影响

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摘要:

本文采用脉冲电流法(PGM)在不同的基底材料表面沉积PANI, 通过平均电位\|时间曲线及扫描电子显微镜(SEM)等方法研究了基底材料对PGM法制备PANI的影响; 并采用循环伏安(CV)和电化学阻抗谱(EIS)研究了不同电极材料表面PANI的电化学性能.

关键词: [聚苯胺; 基底材料; 脉冲电流法\(PGM\); 电化学行为zz'](#)" href="#"> [聚苯胺; 基底材料; 脉冲电流法\(PGM\); 电化学行为](#)

Influences of Substrate Materials on Properties of Nano-fibrous Polyaniline Film Prepared by Pulse Galvanostatic Method

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Abstract:

Effects of substrate materials on the properties of nanofibrous polyaniline(PANI) film prepared by the pulse galvanostatic method(PGM) were investigated. The chronopotentiograms of aniline polymerization in 0.3 mol/L aniline+1 mol/L HNO₃ aqueous solution showed that the anodic potential on Pt and Ru electrodes rised to 880 and 850 mV quickly when the mean current density was 1.0 mA/cm² . The potential turned to 750 mV after about 40 s and kept constant until the experiment was over. When the aniline polymerization occurred on stainless steel(SS) and Al electrodes, the anodic potential climbed to 1100 and 1700 mV respectively, and after about 55 and 250 s it turned to 750 mV. The scanning electron microscopic images demonstrated that the PANI films on Pt, Ru, SS and Al prepared by PGM all exhibited a similar fibrous morphology with a diameter of 80-100 nm. Therefore, it can be considered that the PGM polymerization of aniline on different substrate materials was markedly distinct when the surface of electrode was not covered by PANI completely. The cyclic voltammograms and electrochemical impedance spectroscopy results showed that PANI films on various substrates presented different electrochemical reactivities in an aqueous aniline free solution of 1 mol/L HNO₃.

Keywords: Polyaniline; Substrate material; Pulse galvanostatic method; Electrochemical behavior

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