

研究论文

Pt-CNTs 修饰玻碳电极(Pt-CNTs/GC)电氧化活性的研究

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摘要 采用透射电镜(TEM)和选区电子衍射(SAED)技术, 分别表征了Pt-CNTs/GC电极的表面形貌和所负载铂纳米原子簇的结构. 以CO和CH₃OH为探针分子, 用循环伏安和计时电流等常规电化学方法检测了CO和CH₃OH在Pt-CNTs/GC电极上的氧化行为. 研究表明, CO在Pt-CNTs/GC电极上有3个氧化电流峰(I, II, III), 其中峰I为CO桥式吸附的氧化峰, 而峰II和III则分别为CO线形吸附在碳纳米管负载的不同粒径的Pt纳米原子簇以及Pt原子薄膜上所分裂的氧化峰; CH₃OH在Pt-CNTs/GC电极上也能自发解离吸附强吸附中间体CO; Pt-CNTs/GC电极对CH₃OH的氧化峰电流不总是随CNTs上载铂量的增加而增大, 表明在制备直接甲醇燃料电池阳极时, 应选择合适的载铂量.

关键词 [铂](#) [碳纳米管](#) [甲醇](#) [一氧化碳](#)

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Investigation of Electro-oxidation Activity of Pt-CNTs/GC Electrodes

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Abstract The morphology and the structure character of the Pt-CNTs/GC electrode were characterized via Transmission Electron Microscopy(TEM) and the selected area electron diffraction. The electro-oxidation behavior of CO and methanol on Pt-CNTs/GC electrode were studied with cyclic voltammograms or Chronoamperometry. Three oxidation peaks were observed for CO observed on Pt-CNTs/GC electrode. Methanol were found to be dissociated spontaneously on the electrode to produce a strong adsorbed intermediate CO. Among the three oxidation peaks, peak I is due to the bridged CO adsorbing. But peaks II and III were assigned to split of the linear CO which is adsorbed on the Pt-CNTs nanocluster with different particle sizes and Pt film. The oxidation current of methanol on Pt-CNTs/GC electrode was always not increasing with the increasing of the amount of Pt loading. The result indicates that there is an optimal Pt loading for methanol oxidation. It is necessary to select the catalyst with proper pt loading when the anode of direct-methanol fuel cell was prepared.

Key words [Platinum](#) [Carbon nanotube](#) [Methanol](#) [Carbon monoxide](#)

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