

Full Papers

**Pt-MoO<sub>x</sub>/CNT**电极的制备及其对乙醇氧化电催化性能研究

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**摘要** 以MoO<sub>x</sub>代替贵金属Ru作为辅助催化剂, 采用电位阶跃法在MoO<sub>x</sub>/碳纳米管(CNT)电极上电化学沉积Pt纳米颗粒, 制备了Pt-MoO<sub>x</sub>/CNT电极。采用扫描电子显微镜、

X射线能量色散谱仪和循环伏安法对所制备的Pt/MoO<sub>x</sub>/CNT电极进行了表征,

考察了Pt/MoO<sub>x</sub>/CNT电极对乙醇氧化的电催化性能。同时,

就MoO<sub>x</sub>沉积量对电极的催化活性和乙醇氧化活化能的影响进行了研究。Pt/MoO<sub>x</sub>/CNT电极的长期循环稳定性研究表明, 经过500圈循环伏安扫描后, Pt/MoO<sub>x</sub>/CNT电极的催化活性仍保持在最初的82%, 而Pt/CNT和Pt-Ru/CNT电极分别为55%和72%。

**关键词** [乙醇氧化](#), [碳纳米管](#), [氧化钼](#), [铂](#)

分类号

**Preparation of Pt-MoO<sub>x</sub>/CNT Electrode and Its Electrocatalytic Property for Ethanol Electrooxidation**

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**Abstract** MoO<sub>x</sub>, a non-noble secondary catalyst instead of noble metal Ru, was dispersed on carbon nanotubes (CNT) and then the primary catalyst Pt was electrodeposited on MoO<sub>x</sub>/CNT/graphite electrode by potential-step method. CNT used was grown directly on graphite disk by chemical vapor deposition. The Pt-MoO<sub>x</sub>/CNT/graphite electrode was characterized by scanning electron microscopy and energy dispersive X-ray spectroscopy. The electrocatalytic property and the long-term cyclic stability of Pt-MoO<sub>x</sub>/CNT/graphite electrode for ethanol oxidation have been investigated in 1.0 mol/L CH<sub>3</sub>CH<sub>2</sub>OH+0.1 mol/L H<sub>2</sub>SO<sub>4</sub> by cyclic voltammetry. On the other hand, the effect of the loading mass of MoO<sub>x</sub> on specific activity of Pt-MoO<sub>x</sub>/CNT/graphite electrode and the activation energy of ethanol oxidation were investigated. The Pt-MoO<sub>x</sub>/CNT/graphite electrode shows good long-term cyclic stability. 82% value of peak current density at the oxidation peak around 0.69 V (vs. SCE) remains after 500 cycles, which is higher than those of Pt/CNT/graphite and Pt-Ru/CNT/graphite electrodes with the corresponding values of 55% and 72%, respectively.

**Key words** [ethanol oxidation](#) [carbon nanotube](#) [molybdenum oxide](#) [platinum](#)

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