

研究论文

室温制备高合金化Pt-Ru/CMK-3催化剂及其对甲醇的电催化氧化

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摘要 通过低温络合反应制备了高分散高合金化的Pt-Ru固溶体, 并将其均匀地担载在有序介孔碳CMK-3上, 以形成二元复合金属催化剂. XRD谱图表明, fcc结构的Pt原子部分被hcp结构的Ru原子取代形成置换固溶体, 而且几乎没有未形成合金的Ru存在. TEM和XRD研究结果表明, Pt-Ru/CMK-3催化剂中Pt-Ru合金粒子的平均粒径为2.7 nm, 且具有良好的均一度. 还研究了催化剂对甲醇的电催化氧化性能, 并与E-TEK公司同类催化剂进行了对比, 研究表明, Pt-Ru/CMK-3催化剂具有较大的电催化活性面积, 对甲醇的电催化氧化性能和抗CO中毒能力明显优于其它同类催化剂.

关键词 [DMFC](#) [Pt-Ru/CMK-3](#) [络合反应](#) [介孔材料](#) [甲醇电催化氧化](#)

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Preparation of High Alloying Pt-Ru/CMK-3 Catalysts at Room Temperature and Electrocatalytic Oxidation of Methanol

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Abstract High-alloying Pt-Ru solid solution was prepared by complexing reaction and uniformly dispersed on rigid ordered mesoporous carbon CMK-3 to form the two-element composite catalysts. XRD patterns show that Pt atoms with fcc structure were almost replaced by Ru atoms with hcp structure. XRD and TEM measurements indicate that the average diameter is 2.7 nm with a uniform size. The electrocatalytic activity of Pt-Ru/CMK-3 for the ethanol oxidation was studied and compared with that of Pt-Ru/XC-72 of E-TEK congeneric catalyst. The results show that the catalyst of Pt-Ru/CMK-3 possesses a bigger electrocatalytic activity area, the electrocatalytic activity for the oxidation of methanol and the ability of resisting CO poison exceed the same kind catalysts because of the appropriate extent of alloying and average particle diameter.

Key words [DMFC](#) [Pt-Ru/CMK-3](#) [Complexing reaction](#) [Mesoporous materials](#) [Electrocatalytic oxidation of methanol](#)

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