

### 碳纤维基PtSn催化剂直接乙醇燃料电池制备及性能研究

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### Preparation and performance research of PtSn catalyst supported on carbon fiber for direct ethanol fuel cells

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**摘要** 采用自制的碳纤维基PtSn催化剂薄膜作为阳极催化剂,商用Pt/C作为阴极催化剂,Nafion 115膜作为质子交换膜,通过热压制膜成膜电极,组装平板型直接乙醇燃料电池,搭建测试系统进行性能的测试,研究了温度、乙醇浓度、溶液流量、进气流量等参数对DEFC的影响。结果表明,当乙醇溶液浓度为1.0 mol/L、溶液进样流量为1.0 mL/min、溶液温度为80 ℃、氧气进样流量为100 mL/min时结果较优,单电池的最高功率密度达18.2 mW/cm<sup>2</sup>。

**关键词:** 直接乙醇燃料电池(DEFC) 碳纤维 PtSn催化剂 膜电极

**Abstract:** PtSn anode catalyst supported on carbon fiber was taken as the anode catalyst of the MEA. Commercial Pt/C catalyst was used in MEA as the cathode catalyst. The Nafion 115 membrane was the proton exchange membrane of the MEA. MEA was fabricated by hot-pressing. The single flat cell was assembled with the prepared MEA. The influences of temperature, ethanol concentration, rates of liquor and O<sub>2</sub> were studied. The results showed that the performance of the fuel was better when the concentration of ethanol was 1.0 mol/L, the rate of liquor was 1.0 mL/min, the temperature was 80 ℃, and the rate of O<sub>2</sub> was 100 mL/min, the maximum power density of the fuel reached about 18.2 mW/cm<sup>2</sup>.

**Key words:** direct ethanol fuel cell (DEFC) carbon fiber PtSn catalyst membrane electrode assemble

收稿日期: 2012-06-07;

基金资助:

国家科技支撑计划(2011BAG02B10); 江苏高校优势学科建设工程一期项目; 江苏高校自然科学重大基础研究项(08KJA480001); 南通市应用研究计划项目(BK2011029); 南通大学自然科学研究专项(09ZJ002, 11ZY007)。

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引用本文:

王旭红,袁善美,朱昱等. 碳纤维基PtSn催化剂直接乙醇燃料电池制备及性能研究[J]. 燃料化学学报, 2012, 40(12): 1454-1458.

WANG Xu-hong, YUAN Shan-mei, ZHU Yu et al. Preparation and performance research of PtSn catalyst supported on carbon fiber for direct ethanol fuel cells[J]. J Fuel Chem Technol, 2012, 40(12): 1454-1458.

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