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论文

MnO2掺杂的MmNi3.2Al0.2Mn0.6Co1.0对NaBH4氧化的电催化性能

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摘要:

通过测试线性扫描伏安曲线研究了MmNi3.2Al0.2Mn0.6Co1.0(Mm为混合稀土)经KOH处理和MnO2掺杂对催化NaBH4电氧化性能的影响. 发现NaBH4在经KOH处理后的合金上峰电流达到50 mA/cm2. 若再进行MnO2掺杂, 其电催化活性会进一步提高, 当掺杂MnO2的质量分数为10%时, MmNi3.2Al0.2Mn0.6Co1.0对NaBH4电氧化的峰电位和峰电流密度分别为-0.45 V和126 mA/cm2, 峰电流密度为只经过KOH处理的合金的2.5倍, 是未经过任何处理的合金的9倍.

关键词: 直接硼氢化物燃料电池; MnO2掺杂; 储氢合金; 电氧化

Electrocatalytic Performances of MmNi3.2Al0.2Mn0.6Co1.0 Modified with MnO2 for NaBH4 Oxidation

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Abstract:

The effect of KOH treatment and MnO2 adulteration of the MmNi3.2Al0.2 Mn0.6Co1.0(Mm is misch metal) on the electrocatalytic activity for borohydride oxidation was investigated by the linear sweeping voltammograms test. It was found that the peak potential and current density of the NaBH4 oxidation at the MmNi3.2Al0.2Mn0.6Co1.0 catalyst without any treatments are -0.65 V and 14 mA/cm2, respectively. After KOH treatment, the peak potential remains the same, but the peak current density reached 50 mA/cm2, which is 3.6 times of that at the un-treated MmNi3.2Al0.2Mn0.6Co1.0. KOH treatment followed by the MnO2 adulteration further increased the electrocatalytic activity of the MmNi3.2Al0.2Mn0.6Co1.0. When the mass fraction of MnO2 to MmNi3.2Al0.2Mn0.6Co1.0 is 10%, the peak potential and current density are -0.45 V and 126 mA/cm2, respectively. The peak current density is 2.5 and 9 times of that at the MmNi3.2Al0.2Mn0.6Co1.0 with and without KOH treatment, respectively.

Keywords: Direct borohydride fuel cell; MnO2 adulteration; Hydrogen storage alloy; Electrooxidation

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