

MnO_x 活性层制备条件对 Ti/SnO₂+Sb₂O₃/MnO_x 电极性能的影响

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摘要 研究了MnO_x活性层焙烧温度对Ti/SnO₂+Sb₂O₃/MnO_x电极性能的影响. 用XRD、

SEM对电极活性层的结构、形貌进行了表征, 通过极化曲线和循环伏安曲线研究了电极在25℃ 1.0mol/L H₂SO₄溶液中的电催化活性, 并应用阳极快速寿命检测法测定了电极寿命. 结果表明: 焙烧温度为200℃时, 只有MnO₂生成; 焙烧温度在300和400℃之间时, 同时有Mn₂O₃和MnO₂晶体生成, 即在该温度范围内, Mn₂O₃和MnO₂共存; 焙烧温度高于450℃时, 在实验条件下, 只有Mn₂O₃的衍射峰.

焙烧温度对电极电催化活性和电极寿命有显著的影响, Mn₂O₃和MnO₂共存时电极具有较低的析氧电位.

焙烧温度为400℃时制备的电极电催化活性较高, 快速寿命检测法测得其电极寿命达39h, 具有良好的稳定性.

关键词 [氧化锰](#) [阳极](#) [钛](#)

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Effects of Preparation Conditions of MnO_x Coatings on Characteristics of

Ti/SnO₂+Sb₂O₃/MnO_x Anodes

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Abstract MnO_x coatings deposited on a Ti/SnO₂+Sb₂O₃ were prepared by the thermal decomposition of Mn(NO₃)₂. Surface morphology and microstructure of the coating were investigated by X-ray diffraction and scanning electron microscopy. The electrocatalytic activity of the anodes was assessed by polarization curves and voltammetric charge at 25°C and 1.0mol/L in aqueous H₂SO₄, and accelerated life tests were performed at 60°C and 1.0mol/L in aqueous H₂SO₄ with an anodic current density of 4.0A/cm². The aim of this work was to prepare anodes based on ternary oxides showing high stability and electro-catalytic activity in acid solution. The XRD analysis reveals that MnO₂ is formed at 200°C, after that, MnO₂ and Mn₂O₃ coexist between 300°C and 400°C and above 450°C main composition is Mn₂O₃. It is suggested that calcination temperatures affect the electro-catalytic activity and the lifetime of the anodes. The anode possesses relatively low overpotential, when the coexistence of MnO₂ and Mn₂O₃. The Ti/SnO₂+Sb₂O₃/MnO_x electrode, the MnO_x coatings prepared at 400°C, exhibits excellent electrocatalytic activity and higher coating stability with accelerated life of 39h.

Key words [MnOx](#) [anode](#) [titanium](#)

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