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纳米晶**Ni-Mo**合金复合镀层中钼含量对析氢反应的影响

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摘要 本文利用复合电镀的方法, 将用高能机械球磨制备的纳米晶Ni-Mo合金粉制成对析氢反应有高催化性的电极。用X射线衍射仪、X射线光电子能谱仪测试了这些纳米晶的大小及复合镀层的组成, 用稳态极化曲线及交流阻抗技术测试了这些电极析氢的电化学特性。实验结果表明: 在本文研究的范围内镀层中钼含量的增加可以提高电极析氢的催化活性, 电化学脱附是这些电极上析氢反应速度的决定步骤。

关键词 电极 镍合金 X射线衍射分析 电镀 X射线光电子谱法 钼合金 催化活性 纳米相材料 析氢反应

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Effects of molybdenum content of nanocrystalline Ni-Mo alloy composite coating on hydrogen evolution reaction

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Abstract A kind of highly catalytic electrode for the hydrogen evolution reaction (HER) was prepared by composite coating of nanocrystalline Ni-Mo alloy particles, made from high energy mechnical ball mill, on nickel base. The size of the nanocrystal of Ni-Mo alloy and the composition of the composite coating were measured by XRD and XPS. The electrochemical behaviour of the electrode for HER was studied by using of steady polarization and a. c. impedance technique. It is shown that the electrocatalytic activity of the electrode is enhanced with increasing of molybdenum content in the composite coating and the reaction rate was determined by the electrodesorption step.

Key words ELECTRODE NICKEL ALLOYS X-RAY DIFFRACTION ANALYSIS ELECTROPLATING X-RAY PHOTOELECTRON SPECTROMETRY MOLYBDENUM ALLOYS CATALYTIC ACTIVITY NANOPHASE MATERIALS

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