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论文

双层Ni-P 合金镀层制备及耐蚀性

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摘要:

为研究双层Ni-P 合金镀层的高耐蚀性,通过改变络合剂组分和控制化学镀工艺条件,制备了3 种不同磷含量的镀层. 用XRD, EDS 和SEM 方法,对镀层的成分、结构和形貌进行表征,并用电化学方法和腐蚀膏法,分别测定了镀层的腐蚀电位和耐蚀性. 结果表明:不同的镀液成分和化学镀工艺使镀层的磷含量和组织结构发生变化. 随镀层中磷含量上升,镀层组织的变化从晶态到晶态+非晶态,最后到非晶态,使镀层的自腐蚀电位及自腐蚀电流分别增加和下降. 在外层为低电位层(-550 mV),内层为高电位层(-295 mV),内外层厚度比为2 :1时,镀层的耐腐蚀性最好.

关键词: Ni-P 合金;双层镀层;耐蚀性

Fabrication and Corrosion Resistance of Ni-P Duplex Layer Coating

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Abstract:

Three different coatings were prepared with different complexing agents and electroless plating procedures. The composition, microstructure and morphology of the coatings were characterized by X-ray diffractometer (XRD), X-ray energy dispersive spectrometer (EDS)and scanning electron microscope (SEM). The corrosion resistances and corrosion potentials of the coatings were measured chemically and chemicoelectrically, respectively. The results demonstrated that the composition and electroless plating procedure significantly affected phosphorus concetration and microstructure of the coating, but no obviouse trends were observed. As the increase in phosphorus concentration in the coatings, their microstructures changed from crystalline to crystalline and amorphous states, and finally to amorphous state,causing the self-corrosion potential and current of the coating to increase and decrease, respectively. The best corrosion resistance appeared when the outer layer had a low potential (-550 mV) and the inner layer a high potential (-295 mV), and the thickness of the inner layer was twice as that of the outer one.

Keywords: Ni-P alloy duplex layer coating corrosion resistance

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