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论文

磷化液中ZnO对AZ61镁合金磷化膜的影响

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摘要:

探讨了锌系磷化液中主要的成膜物质ZnO的质量浓度对AZ61镁合金磷化膜的微观结构和性能的影响.利用金相显微镜、扫描电镜、能谱分析仪观察和分析了磷化膜的结构、表面形态和组成成分,并通过阳极极化曲线测量评价了磷化膜的耐腐蚀性能.结果表明:在低ZnO质量浓度的磷化液中,获得的磷化膜比较疏松且不完整,其并未表现出优异的耐腐蚀性;在高ZnO质量浓度的磷化液中,得到的磷化膜晶粒较粗大,厚度不均匀,耐腐蚀性不佳;在中等ZnO质量浓度2.0g / L的磷化液中,得到了均匀、完整的磷化膜层,极化曲线测量表明了其在质量分数为3.5%NaCl溶液中具有较好的耐腐蚀性.

关键词: 镁合金;磷化膜;磷化;耐蚀性

Influence of zinc oxide in a phosphating bath on phosphate coating on AZ61 magnesium alloy

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Abstract:

The influences of the mass concentration of zinc oxide(the main film-forming substance) in the phosphating bath on the microstructure and properties of the phosphate coating on AZ61 magnesium alloy were studied. The structure, surface morphologies and compositions of the phosphate coatings were observed and analyzed by using a metallographical microscope,SEM and EDS. Anodic polarization measurement was used to assess the corrosion resistance of the phosphate coating on the magnesium alloy. The results indicated that the phosphate coating obtained from a phosphating bath with a lower concentration of ZnO was a loose and defected structure, without exhibiting enough corrosion resistance. The phosphate coating obtained from a phosphating bath with a higher mass concentration of ZnO is composed of coarse crystals and the thickness of the coating was uneven, showing poor corrosion resistance. The uniform and intact phosphate coating which was obtained from a phosphating bath with a medium mass concentration of 2.0g/L ZnO showed high corrosion resistance in a 3.5% NaCl solution.

Keywords: magnesium alloy; phosphate coating; phosphating; corrosion resistance

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