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化学与化工

磷化液的pH值对AZ61镁合金锌系磷化膜的影响

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摘要：

探讨了AZ61镁合金在不同pH值的磷化液中制得的磷化膜的性能和表面形貌。通过腐蚀失重试验、阳极极化曲线测试和交流阻抗测试对磷化膜的耐蚀性进行了研究,利用金相显微镜、热场发射扫描电镜分析了磷化膜的外观结构。实验结果表明:磷化液的pH值对磷化膜的耐蚀性和表面形貌有很大影响。在低pH值的磷化液中得到的磷化膜疏松多孔、耐蚀性差;在高pH值的磷化液中得到的磷化膜外观粗糙、耐蚀性差;在磷化液pH值适中(pH值为2.5)的磷化液中所得的磷化膜外观细致均匀、耐蚀性好。

关键词： 镁合金 磷化 pH值 耐蚀性

Influence of pH value in a phosphating bath on zinc phosphate coatings on the AZ61 magnesium alloy

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Abstract:

The properties and microstructure of the zinc phosphate coatings on the AZ61D magnesium alloy prepared in phosphating baths with different pH values were studied. Weight loss test, anodic polarization measurement and electrochemical impedance spectroscopy were used to access the corrosion resistance of phosphate coatings. The structure and surface morphologies of phosphate coatings were observed by a metallographical microscope and analytical electron microscope. Results indicated that the pH values of phosphating baths had obvious effect on the anticorrosive performance and surface morphologies of phosphate coatings on the magnesium alloy. Phosphate coatings obtained in the baths with higher pH values were porous with poor anticorrosive performance, while the coatings fabricated at lower pH values were coarse with poor anticorrosive performance.The coatings prepared at a moderate pH value (pH value was 2.5) were uniform and with good anticorrosive performance.

Keywords: magnesium alloy phosphating pH value corrosion resistance

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