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研究报告

AZ31B镁合金表面电镀铝锰合金的耐蚀性

张吉阜,张伟,杜克勤,严川伟,王福会

中国科学院金属研究所 金属腐蚀与防护国家重点实验室 沈阳 110016

摘要:

在镁合金AZ31B表面通过预镀锌处理后采用无机熔盐电沉积铝锰合金。使用SEM、EDX和XRD分析镀层的表面形貌、成分和组织,采用动电位极化曲线及表面显微硬度测量考察了镀层对镁合金耐蚀耐磨性的影响。结果表明,熔盐成分、电流密度和熔体温度等典型工艺参数对铝锰合金镀层的形貌、成分和组织都具有重要的影响,进而影响了镀层的耐蚀性。镁合金电镀铝锰合金后,腐蚀电位有很大的提高,而腐蚀电流密度大幅度的下降;同时铝锰合金镀层表现出很高的硬度,显著的提高了镁合金的耐蚀耐磨性。

关键词: 镁合金 电镀 铝锰合金 耐蚀性

IMPROVED CORROSION RESISTANCE OF AZ31B MAGNESIUM ALLOY BY ELECTROPLATING OF Al-Mn ALLOY

ZHANG Jifu, ZHANG Wei, DU Keqin, YAN Chuanwei, WANG Fuhui

State Key Laboratory for Corrosion and Protection, Institute of Metal Research, Chinese Academy of Sciences, Shenyang 110016

Abstract:

Al-Mn alloy coatings were deposited on zinc pre-plated magnesium alloy AZ31B from a bath of inorganic molten salts. Then the microstructure, composition and phase constituents of the coatings were investigated by scanning electron microscopy (SEM), energy-dispersive X-ray spectrometry (EDX), and X-ray diffraction (XRD). The corrosion and wear resistance of the coatings was evaluated by potentiodynamic polarization and microhardness measurements, respectively. The results indicated that the typical processing parameters such as composition of molten salts, cathode current density and temperature had important effect on the morphology and chemical composition of the Al-Mn alloy, and the alloy coating with various composition present different phase constitution. It showed that the Al-Mn alloy coating exhibited a much higher corrosion potential and lower corrosion rate than that of Mg alloy AZ31B, so it can well protect the magnesium alloy AZ31B against corrosion.

Keywords: magnesium alloy electroplating Al-Mn alloy corrosion resistance

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通讯作者: 严川伟

作者简介: 张吉阜,男,1981年生,博士生,研究方向为腐蚀与防护

通讯作者E-mail: cwyan@imr.ac.cn

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