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研究论文

Mg--Li合金微弧氧化陶瓷膜制备及其耐蚀性能

施玲玲^{1,2}; 徐用军^{1,2}; 李康¹; 姚忠平¹; 姜兆华¹

- 1.哈尔滨工业大学化工学院 哈尔滨 150001
- 2.哈尔滨工程大学超轻材料与表面技术教育部重点实验室 哈尔滨 150001

摘要:

通过三种优化工艺体系在Mg--5%Li合金表面上生长陶瓷膜层,分析了膜层的厚度、显微结构、相组成和耐蚀性.结果表明,三种膜层都含有MgO相,微弧氧化试样的耐蚀性能都明显提高.使用Na₃PO₄体系制备的膜层含有MgF₂,膜层最厚、表面有大量裂纹;使用Na₂SiO₃体系制备的膜层含有橄榄石型Mg₂SiO₄,耐点蚀性能最好;使用Na₂SiO₃--Na₃PO₄体系制备的膜层含有MgSiO₃,致密性最好,膜层耐均匀腐蚀性能最好.

关键词: 材料失效与保护 Mg--Li合金 微弧氧化 陶瓷膜 耐蚀性

Corrosion resistance property of micro-arc oxidation coatings on Mg-Li alloy obtained in different systems

SHI Lingling¹; XU Yongjun^{1,2}; LI Kang¹; YAO Zhongping¹; JIANG Zhaohua¹

- 1.Department of Chemical Engineering; Harbin Institute of Technology; Harbin 150001
- 2.Key laboratory of super light materials and surface technology; Ministry of Education; Harbin Engineering University; Harbin 150001

Abstract:

Ceramic coatings were prepared on the surface of Mg-5%Li alloy in three kinds of optimized electrolytes by single-polar pulsed micro-arc oxidation (MAO). Thickness, microstructure, phase composition and corrosion resistance of the ceramic coatings were investigated. The results showed that all the MAO coatings were composed of MgO, and their corrosion resistance was improved distinctly. The coating gained in Na₃PO₄ system contained MgF₂, and was the thickest with a great deal of cracks; the coating from Na₂SiO₃ system included olivine Mg₂SiO₄, and had the best pitting corrosion resistance; the coating from Na₂SiO₃--Na₃PO₄ system contained MgSiO₃, showed the most compact micro-surface, and owned the best uniform corrosion resistance.

Keywords: materials failure and protection Mg-Li alloy micro-arc oxidation ceramic coatings corrosion resistance

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通讯作者: 徐用军

作者简介:

通讯作者E-mail: xuyongjun1218@126.com

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