



Anodic Coating of Mg-Nd-Gd-Zn-Zr (EV31A) and Mg-Y-Nd-Gd-Zr (WE43C) in Saline Solution

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Abstract

Mg-Nd-Gd-Zn-Zr (EV31A) and Mg-Y-Nd-Gd-Zr (WE43C) are heat-treatable magnesium (Mg) alloys which are used in aerospace and high performance applications. Their strength to weight ratios are higher than aluminum alloys. In addition, their corrosion resistance was improved. Anodization in NaF is a typical method to protect surface of Mg alloys from corrosion. EV31A and WE43C in as-received and peak-aged conditions were anodized in NaF and investigated. The studies were conducted in 0.1 M NaOH solution with 500 ppm of chloride concentration. Anodized EV31A in as-received condition showed better pitting protection potential than the non-anodized one. In contrast, peak-aged EV31A which was not anodized presented better pitting protection potential compared to anodized peak-aged EV31A. Pitting protection potentials of both as-received and peak-aged conditions of WE43C were improved when the materials were anodized.

Keywords: Magnesium rare earth alloy; Anodic coating; Chloride