Short Communication

Improving the Anti-Corrosion Ability of Anodization Film of AZ31B Magnesium Alloy by Addition of NH₄VO₃ in the Electrolyte

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AZ31B magnesium alloy was anodized in an alkaline electrolyte containing sodium borate, sodium silicate and sodium citrate. Ammonium metavanadate (NH_4VO_3) was used as an additive to improve the anti-corrosion ability of anodization film. The anodization film was characterized by X-ray diffraction and scanning electron microscopy. The anti-corrosion ability of the film was evaluated by electrochemical impedance spectrum. The results show that VO_3^- ions react with Mg^{2+} to form yellow magnesium vandate. Magnesium oxide in anodization film is restrained by VO_3^- . The pores on the film decreases and the cracks can be filled by the addition of NH_4VO_3 . The film also becomes smoother and compacter which increase the resistance of film and charge transfer resistance of the corrosion process of the AZ31B magnesium alloy. The anti-corrosion ability of the anodization film is obviously enhanced.

Keywords: Magnesium alloy; anodization film; anti-corrosion; ammonium metavanadate

FULL TEXT

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