Comparison of the Inhibition Effect of Four Inhibitors on the Corrosion Behaviour of AM60 Magnesium Alloy

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The inhibition effect of four inhibitors of sodium citrate (SC), sodium dodecylbenzenesulphonate (SDBS), diammonium phosphate ((NH₄)₂HPO₄) and sodium vanadate (NaVO₃) on the corrosion behaviour of AM60 magnesium alloy in 0.1 M sodium chloride (NaCl) solution was investigated by immersion and electrochemical tests, surface morphology and chemical composition analyses. The results show that AM60 suffers severe attack in NaCl solution in long-term immersion. When inhibitors are added, its corrosion resistance is improved. All these inhibitors can form a barrier to inhibit the corrosion process. Especially, the barrier becomes more protective after longer immersion. All the inhibitors except (NH₄)₂HPO₄ can prevent the localized corrosion of AM60. The inhibition efficiency of organic inhibitors is better than that of inorganic inhibitors. The most efficient inhibitor is SDBS with efficiency up to 93% measured by hydrogen evolution.

Keywords: Magnesium alloys; Inhibitors; Inhibition efficiency; Corrosion resistance; Product films

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