

A study on biocompatibility of gadolinium based anodizing coating AZ91D magnesium alloy in Simulated Body Fluid (SBF) solution

Abstract

Pure Mg and AZ91D alloy was anodized with and without the gadolinium nitrate $Gd(NO_3)_3$ in different concentrations (0.001g/l, 0.025g/l, 0.05g/l, 0.075g/l and 0.09g/l) at a constant current density and treatment time of 10mA/cm² and 5 minutes. The results showed that the optimum gadolinium concentration is 0.075g/l due to obtaining the anodic film with high corrosion resistance. The surface morphology and microstructure of anodic coating were investigated by scanning electron microscopy (SEM), optical microscope (OM), and potentiodynamic polarization, respectively.

Keywords; Anodizing coating; Corrosion rate; Gadolinium; Magnesium alloy; SBF