Abstract

Magnesium is potential candidate for cardiovascular stent and orthopedic implant applications. Owing to biocompatible and Biodegradable properties, it possesses similar mechanical properties like bone. The advantage of magnesium to use it as an implant, it degrades and dissolves in body fluid and don't require second surgery after healing of bone as it degrades and dissolves in body fluids. Its degradability is very high and to be controlled. To control its degradation a technique of surface modification is adapted through nitrogen ion implantation. The nitrogen ions are implanted on two samples of surface of magnesium through 1-layer of lesser energy and 2-layers of different energies but keeping ion dose same for both samples. The XRD analysis and SEM confirmed nitrogen ions incorporation. 1-Layer modification surface shows no uniformity but 2-Layer shows uniform distribution of nitrogen ions in form of ripple like structure. Hardness was increased for both samples of 1-Layer and 2-Layer but grain size was decreased determined by increasing FWHM. Electrochemical test revealed that open circuit potential increased while corrosion current density and corrosion rate was decreased for 2-Layer sample due to uniform distribution of ions but open circuit potential decreased while corrosion current density and corrosion rate was increased for 1-Layer sample due to increase in surface area after producing voids in surface when compared to untreated sample, confirming that 2-Layer surface modification makes magnesium more stable but 1-Layer modification is not suitable in improving degradability of magnesium.