

Corrosion Characteristics of PEO-treated Ti-6Al-4V Alloy in Solution Containing Si and Mg Ions

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초 록: The application of the coating supports the mechanical characteristics of the implant, and various materials and coatings are currently being used in the implant in a way to accelerate adhesion. Especially, plasma electrolytic oxidation (PEO) coating has been proposed continually with good surface treatment of titanium alloys. Also, the PEO process can incorporate Ca and P ions on the titanium surface through variables varied factor. PEO process for bioactive surface has carried out in electrolytes containing Ca and P ions. Natural bone is composed of mineral elements such as Mg, Si, Zn, Sr, and Mn, etc. Especially, Mg and Si of these elements play role in bone formation and growth after clinical implantation of bio-implants.

In this study, corrosion characteristics of PEO-treated Ti-6Al-4V alloy in solution containing Si and Mg ions has been investigated using several experimental techniques. The PEO-treated surfaces were identified by X-ray diffraction, using a diffractometer (XRD, Philips X'pert PRO, Netherlands) with Cu K α radiation. The morphology was observed by field-emission scanning electron microscopy (FE-SEM, Hitachi 4800, Japan) and energy-dispersive X-ray spectroscopy (EDX, Oxford ISIS 310, England). The potentiodynamic polarization and AC impedance tests for electrochemical degradations were carried out in 0.9% NaCl solution at similar body temperature using a potentiostat with a scan rate of 1.67mV/s and potential range from -1500mV to + 2000mV. (This work was supported by NRF: 2015H1C1A1035241 & NRF: No.2008-0062283.; *hcchoe@chosun.ac.kr).