

Chapter 1

Introduction



Hydroxyapatite has long been investigated and used as bone and tooth implant material because it closely resembles vertebrate bone and tooth minerals. This material has proven to be the most biocompatible bone implant substances known and possessed the very important property of becoming strongly bonded to living bone tissues by apparently natural bone-bonding mechanism (Jarcho, 1988). Unfortunately, sintered hydroxyapatite, as the same of other ceramics, does not have sufficient mechanical properties for many important implant applications.

The aim of this research was to improve strength properties of sintered hydroxyapatite by compressive surface stress induction. The method was commonly done by coating with materials having lower thermal expansion coefficients in order to induce the compressive stresses at the surface layer. Coating material selected for this research was hydroxyapatite which came from different preparation methods. A reason for this selection was about biocompatibility of the product.

Sequence of the experiment was preparing two kinds of hydroxyapatite having different thermal expansion coefficients, forming each of them into a rectangular bar by uniaxial pressing technique, coating each green specimen by dipping in a suspension of the hydroxyapatites mixed in various proportions, sintering and strength measuring.