DISSOLUTION/PRECIPITATION BEHAVIOR OF HYDROXYAPATITES PREPARED FROM CATTLE BONE ASH

Dujreutai Pongkao[+], Charussri Lorprayoon[++] and Reinhard Conrade[+++]

Department of Materials Science, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand

Abstract

The dissolution-precipitation behaviors of hydroxyapatites HA) derived from calcined cattle bone with and without chemical treatments (MP and TP respectively) were studies under human physiological condition. Both specimens were incubated in simulated body fluid (SBT) at 37°C with a sample surface area to solution volume ratio of 0.1 $cm.^{-1}$, 5%CO_2 was used to adjust pH of this solution to 7.40±0.05. The characteristics of MP and TP specimens were examined before and after incubation in SBF. The phase present and functional group of both specimens did not change after incubation for 90 days but the Ca:P ratio and bulk density decreased, hence the porosity increased. Furthermore, the newly formed precipitates appeared on the surface of both specimens after incubation for 30 days and covered all over the surface in 90 days. From the chemical analysis, it was found that this newly formed precipitates were calcium phosphate compound containing carbonate group in phosphate site structure, the phase of this compound was similar to natural cattle bone.

KEYWORDS: Hydroxyapatite, Dissolution, Precipitation, In vitro study, Cattle bone

Proceedings of the 12th International Symposium on Ceramics in Medicine) Nara, Japan, Octoter 1999