KSUC-OI-007

Using hydroxyapatite derived from chicken eggshells as an additive in ceramic products applied for medical applications

Aekgaran Sangmala[1], Weeranut Kaewwiset[2] and Kittisakchai Naemchanthara[1,*]

[1]Department of Physics, Faculty of Science, King Mongkut's University of Technology Thonburi, 126 Pracha-Uthit Rd., Bangmod, Trungkru, Bangkok, 10140, Thailand

[2]Department of Physics, Faculty of Liberal Arts and Science, Kasetsart University, Kamphaeng Saen Campus 1 Malaiman Rd., Kamphaeng Saen, Kamphaeng Saen Nakhon Prathom, 73140, Thailand

[*]Corresponding author: puri_kit@hotmail.com

Abstract

The ceramic samples were preparation by slip casting technique. The hydroxyapatite $Ca_{10}(PO_4)_6(OH)_2$ derived from chicken eggshells was used to be the additive material to apply in the medical applications. The ceramic samples contained with 5, 10, 15 and 20 wt% of hydroxyapatite. From our research, the hydroxyapatite could be used as the major fluxing agent for ceramic products. Especially, the hydroxyapatite could accelerate the clay materials to decompose and transform to amorphous glass phase after sintering. As the results, the hydroxyapatite can be improved the melting of clay materials and transformation to denser phases. Consequently, the flexural strength of ceramic samples was increased with increasing the hydroxyapatite contents. Finally, the ceramic samples were investigated the bioactivity. The results show that the ceramic samples containing hydroxyapatite content can induce the bone-like layer of hydroxyapatite to grow on their surface. All the results could confirm that the ceramic samples can to be used as the materials for medical applications.

Keywords: Bioactivity, Ceramic, Chicken eggshells, Hydroxyapatite, Slip casting