Three-Dimensional Bone Printing Using Hydroxyapatite-PLA Composite

Reza Najafi Zare\textsuperscript{a}, Esmail Doustkhah\textsuperscript{b}, M. Hussein N. Assadi\textsuperscript{c}
\textsuperscript{a}Department of Mechanical Engineering, Faculty of Mechanical Engineering, University of Tabriz, Tabriz, Iran
\textsuperscript{b}International Center for Materials Nanoarchitechtonics (MANA), National Institute for Materials Science (NIMS), Namiki, Tsukuba, Ibaraki, Japan
\textsuperscript{c} School of Materials Science and Engineering, The University of New South Wales, Sydney, NSW, 2052, Australia

Abstract

Hydroxyapatite (HA) is one of the basic materials in construction of the bones. In this study we investigate the new Nano-architecture of HA in a polymer base material like PLA to 3d printing of the bones. We have introduced a simple soft-template approach for Nano-plates from HA. HA nanostructure have been produced which has a thickness and dimension nano and micro meter scales, respectively. Also, XRD, SEM, and TEM experiments have been done to characterized HA. Moreover, the different weight ratios of HA/PLA have been prepared for bone 3D printing and mechanical tests have been done.

References