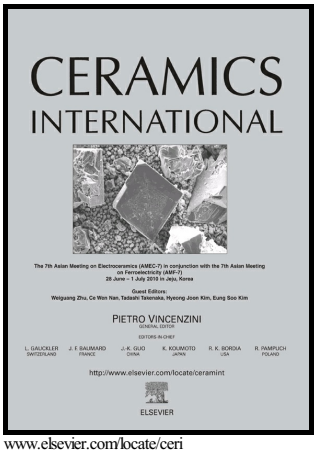

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PII: S0272-8842(17)31753-4
DOI: http://dx.doi.org/10.1016/j.ceramint.2017.08.053
Reference: CERI16007

To appear in: *Ceramics International*

Received date: 27 February 2017
Revised date: 1 August 2017
Accepted date: 7 August 2017

Cite this article as: Jing Wang, Yu Zhu, Menglu Wang, Dan Liu, Xuening Chen, Xiangdong Zhu, Xiao Yang, Kai Zhang, Yujiang Fan and Xingdong Zhang, Fabrication and preliminary biological evaluation of a highly porous biphasi calcium phosphate scaffold with nano-hydroxyapatite surface coating, *Ceramic International,* http://dx.doi.org/10.1016/j.ceramint.2017.08.053

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Abstract

Considering that the structure of scaffold determines its functionality, in this study biphasic calcium phosphate (BCP) scaffold with highly interconnected macroporous structure was firstly fabricated by a polymeric sponge replication method, in which a ethanol solution (25 vol.%) was use for preparation of the slurry and a varying slurry viscosity during multiple impregnations was adopted. Then, the surface coating consisting of nano-hydroxyapatite (nHA) particles was formed by a dip coating technology, i.e. immersing the porous scaffold into the nHA slurry (20 mg/mL) and sintering it at 650 °C. Preliminary *in vitro* experiments showed that compared to BCP one, nHA-coated BCP scaffold could increase protein adsorption, form more complex bone-like apatite, and promote cell adhesion and proliferation, indicating that nHA-coated BCP scaffold exhibited superior biocompatibility and bioactivity. It might be attributed to its surface nanostructure and abundant nano- to micro- scale pores (< 10 μm). This nHA-coated BCP scaffold with both trabecular framework and surface nanoscale topography holds great promise in serving as bone graft for the orthopedic application.

Keywords: BCP scaffold; nHA coating; sponge replication; dip coating; biocompatibility