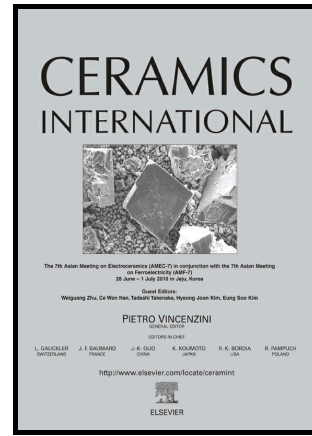


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High performance shape memory foams with isocyanate-modified hydroxyapatite nanoparticles for minimally invasive bone regeneration

Ruiqi Xie,^a Jinlian Hu,^{*a,b} Frankie Ng^a, Lin Tan,^a Tingwu Qin^c Mingqiu Zhang^d, Xia Guo^e

^a Institute of Textiles and Clothing, the Hong Kong Polytechnic University, Hung Hom, Hong Kong, China.

^b Intelligent Polymer of Biomedical Materials Research Center, Shenzhen Base, the Hong Kong Polytechnic University, Shenzhen, China.

^c State Key Laboratory of Biotherapy, Institute of Stem Cell and Tissue Engineering, West China Hospital, Sichuan University, Chengdu, China.

^d Materials Science Institute, Sun Yat-sen University, Guangzhou, China.

^e Department of Rehabilitation Sciences, the Hong Kong Polytechnic University, Hung Hom, Hong Kong, China.

Correspondence to: Jinlian Hu (E-mail:tchujl@polyu.edu.hk)

Abstract: This study provides a comprehensive assessment of shape memory polyurethane (SMPU) composite foams with isocyanate-modified hydroxyapatite (imHA) nanoparticles in terms of their pore structures, mechanical properties, shape memory effects and biocompatibility *in vitro*. The results obtained in the research reveal the effectiveness of imHA nanoparticles in SMPU foams as inorganic cross-linking fillers, which contribute to the enhancement of mechanical properties and shape memory performance. Pore structures and compressive properties are simultaneously optimized when imHA content increases. The imHA enhanced SMPU foam could be adopted as a promising alternative for overcoming the disadvantages of traditional polymer scaffolds, such as insufficient mechanical properties, inadequate pore structure, low bioactivity and inconvenience in operation for bone regeneration.

Keywords: A. composites; B. thermomechanical properties; B. mechanical properties;

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