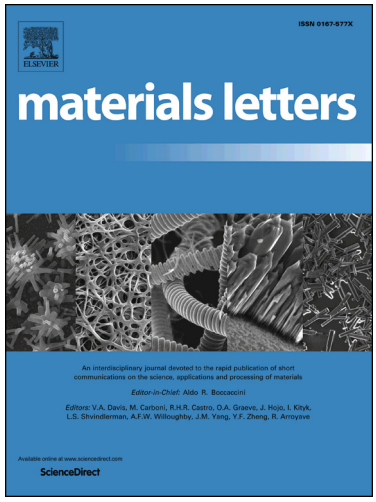

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Solvothermal synthesis of hydroxyapatite with various morphologies using trimethyl phosphate as organic phosphorus source

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ABSTRACT

Hydroxyapatite (HAP) materials with various morphologies including microrods, nanoparticle-assembled microflowers (NAMs), nanoparticle-assembled dendritic superstructures (NADSs), and microrod-assembled ordered arrays (MAOAs) are prepared by a facile solvothermal synthesis strategy using trimethyl phosphate as an organic phosphorus source. The morphologies of the as-prepared HAP products vary significantly with the change of the solvothermal temperature and amount of NaOH. The present study provides a new platform for the synthesis of HAP materials with various morphologies. Among the as-prepared HAP products, The HAP MAOAs show similar structures to those of apatite in the hard tissues of vertebrates. The as-prepared products show excellent biocompatibility, and thus are potentially useful in biomedical fields.

Keywords: Hydroxyapatite; Trimethyl phosphate; Solvothermal; Biomaterials; Biomimetic

1. Introduction

Hydroxyapatite [$Ca_{10}(PO_4)_6(OH)_2$, HAP], the main inorganic component of bone and tooth of humans and animals, has been widely investigated for applications in biomedical fields owing to its excellent biocompatibility [1, 2]. It is known that the performance of HAP materials is highly depended on their morphology, crystallite size and