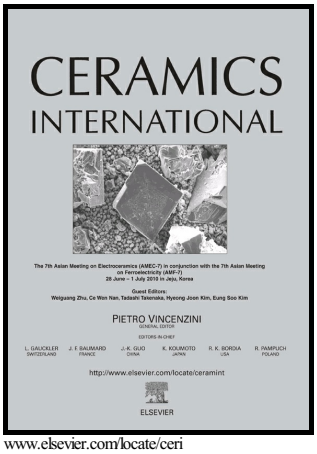

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Epitaxial growth of apatite nanorods on the surfaces of porous calcium phosphate ceramics

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Abstract: Hydroxyapatite (HAP) nanorods are one of important calcium phosphate (CaP) nanomaterials. The controllable assembly of the HAP nanorods into a specific architecture can extend their applications significantly. Herein, we report a hydrothermal method to grow the vertically-oriented HAP nanorods on the surfaces of porous CaP ceramics. Experiments demonstrated that the diameter of the HAP nanorods was directly relative to the diameter of the substrate grains, and the length of the HAP nanorods was sensitive to and could be adjusted by some reactant parameters, including temperature, pH, initial reactant concentration and additives. Among these parameters, the length of the HAP nanorods was in direct proportion to and linearly relative to the reactive time, and was exponentially related to the reactive temperature at a defined reactive time range but irregular when the reactive time was beyond 8 h. Furthermore, experiments also demonstrated that the use of EDTA and the growth substrates containing the HAP component were prerequisites to grow the HAP nanorods.

Keywords: hydroxyapatite nanorods; calcium phosphate; porous ceramics; hydrothermal reaction; epitaxial growth