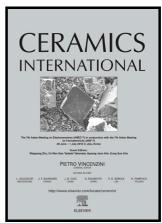
Author's Accepted Manuscript

Improvements in phase stability and densification of β -tricalcium phosphate bioceramics by strontium-containing phosphate-based glass additive

Fupo He, Ye Tian



www.elsevier.com/locate/ceri

PII: S0272-8842(18)30815-0

DOI: https://doi.org/10.1016/j.ceramint.2018.03.236

Reference: CERI17873

To appear in: Ceramics International

Received date: 13 March 2018 Revised date: 26 March 2018 Accepted date: 27 March 2018

Cite this article as: Fupo He and Ye Tian, Improvements in phase stability and densification of β -tricalcium phosphate bioceramics by strontium-containing phosphate-based glass additive, *Ceramics International*, https://doi.org/10.1016/j.ceramint.2018.03.236

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Improvements in phase stability and densification of β -tricalcium phosphate bioceramics by strontium-containing phosphate-based glass additive

Fupo He*, Ye Tian

School of Electromechanical Engineering, Guangdong University of Technology,

Scrip

Guangzhou 510006, People's Republic of China

* Corresponding author. E-mail: fphe@gdut.edu.cn

Abstract

 β -tricalcium phosphate (β -TCP), which transforms to α -TCP at around 1125 °C, is characterized by poor sinterability. In this study, for the first time strontium-containing phosphate-based glass (SPG) was used as a sintering additive for β -TCP, which was sintered at 1250 °C. The results indicated that the SPG additive allowed for liquid-state sintering of β -TCP, thereby noticeably promoting the densification of β -TCP bioceramics. In the sintering process SPG reacted with β -TCP, and the metal ions from SPG were substituted for the calcium ions of β -TCP. The SPG additive effectively inhibited the phase transformation of β -TCP to α -TCP in the bioceramics. The compressive strength of porous β -TCP bioceramics was markedly increased by introducing 10 wt.% SPG. The SPG is considered as an effective sintering additive to improve the phase stability and mechanical strength of porous β -TCP bioceramics.

Download English Version:

https://daneshyari.com/en/article/7887191

Download Persian Version:

https://daneshyari.com/article/7887191

Daneshyari.com