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Tricalcium Phosphate Ceramics Doped with Silver, Copper, Zinc, and Iron (III) Ions in Concentrations of Less Than 0.5 wt.% for Bone Tissue Regeneration

Fadeeva I., Gafurov M., Kiiaeva I., Orlinskii S., Kuznetsova L., Filippov Y., Fomin A., Davydova G., Selezneva I., Barinov S.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Springer Science+Business Media New York. Novel materials with a variety of properties, such as biocompatibility, antibacterial activity, interconnected porosity, and functionalities combined in one, are required for regenerative medicine. Porous β -tricalcium phosphate (β -TCP) ceramics doped with Cu^{2+} , Zn^{2+} , Ag^{+} , and Fe^{3+} ions in the concentrations of less than 0.5 wt.% were synthesized and investigated. The obtained samples were analyzed by the diversity of analytical tools. The structure, solubility, and antimicrobial properties of the porous ceramics are shown to be very sensitive to the presence and the type of the cationic substituent. It opens the way to manage structure and properties of the materials for bone tissue regeneration by co-doping of the initial matrix simultaneously with different types of substituent ions.

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Keywords

Antibacterial properties, Regenerative medicine, Tissue engineering, Tricalcium phosphate

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