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Biocompatibility of ceramic materials in ca2p2o7- ca(po3)2 system obtained via heat treatment of cementsalt stone

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Biocompatibility of ceramic materials in Ca2P2O7-Ca(PO3)2 system was investigated using different methods, including in vitro and in vivo tests. Ceramic materials in the Ca2P2O7-Ca(PO3)2 system were obtained by annealing cementsalt stone based on powder mixtures of calcium citrate tetrahydrate Ca3(C6H5O7)2•4H2O and monocalcium phosphate monohydrate (MCPM) Ca(H2PO4)2•H2O. The phase composition of cement-salt stone included brushite, monetite as a result of chemical reaction of starting components after adding of water. The presence of citric acid as by-product of chemical reaction, leads to increase the setting time of the cement-salt stone. Highly concentrated aqueous suspensions based on calcium citrate and MCPM powders providing content of calcium polyphosphate Ca(PO3)2 up to 20 wt % in ceramics were used for designing bioresorbable materials. The presence of an excess of monocalcium phosphate monohydrate makes it possible to reduce the annealing temperature of ceramics, which is associated with the formation of a lower melting phase of Ca(PO3)2. In vivo tests shown that obtained ceramic materials can be recommended for regenerative treatments for bone defects.

Biography

Konstantin Malyutin is an innovation specialist at the Skolkovo Foundation. He holds a specialist degree in materials science in 2003 and is currently pursuing a PhD in Materials Science from the Moscow Polytechnic University. Konstantin has been passionate about various 3D printing methods since 2012. He has also been involved in the research of ceramic materials as part of major government projects.

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