

Copper-substituted tricalcium phosphates

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Abstract

© 2016, Pleiades Publishing, Ltd. Copper-substituted tricalcium phosphates (CuTCP) with different copper contents were developed using precipitation of copper-containing amorphous calcium phosphates (ACP) from salt solutions followed by heat treatment. Porous CuTCP ceramic was obtained using negative replicas. Using a set of investigation methods (powder X-ray diffraction, IR spectroscopy, ESR spectroscopy, and scanning electron microscopy), all copper-substituted tricalcium phosphates were found to have the whitlockite structure with copper incorporated in TCP in the 2+ oxidation state. The resulting material is promising for the use in regenerative medicine owing to higher solubility in body fluids compared with TCP and combination of bactericidal properties and the lack of cytotoxicity.

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