

Microct and preparation of β -TCP granular material by polyurethane foam method

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R sum  en anglais

Commercial β -tricalcium phosphate (β -TCP) is commercially available in granules manufactured by sintering of powders. We have evaluated the different steps of the manufacturing process of β -TCP ceramics granules prepared from blocks obtained with the polyurethane foam technology. Three types of slurry were prepared with 10, 15 and 25 g of β -TCP per gram of polyurethane foam. Analysis was done by scanning electron microscopy, EDX, Raman spectroscopy and microcomputed tomography combined with image analysis. A special algorithm was used to identify the internal microporosity (created by the calcination of the foam) from the internal macroporosity due to the spatial repartition of the material. The low β -TCP dosages readily infiltrated the foam and the slurry was deposited along the polymer rods. On the contrary, the highest concentration produced inhomogeneous infiltrated blocks and foam cavities appeared completely filled in some areas. 2D microcomputed sections and reconstructed 3D models evidenced this phenomenon and the frequency distribution of the thickness and separation of material trabeculae confirmed the heterogeneity of the distribution. When crushed, blocks prepared with the 25 g slurry provided the largest and irregular granulates.

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