

Mechanical characterization of the PM Hydroxyapatite-based biocomposites elaborated by two-step sintering

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Abstract. The paper focuses on the mechanical characterization of porous biocomposites based on hydroxyapatite submicronic powders (<200 nm), respectively micronic powders particle (30-50 μm) as matrix, reinforced by titanium hybri de powders (10-25 mass%, 100-150 μm) as foaming agent. Another foaming agent used is calcium bicarbonate powder (5-15% mass). The mixture homogenization was made in a Frisch-Pulverisette 6 type planetary mill (n=200 rpm), for 30 minutes. The green compacts were processed by unilateral cold compaction at 150 MPa. The two-step sintering technology (TSS) has been applied to the green parts, on the Nabertherm conventional furnace: at 900⁰C for few minutes (first step) and at 800⁰C for 450 minutes, respectively 600 minutes (the second step). The mechanical characteristics (compression modulus G [MPa] and ultimate compression strength σ_{UTS} [MPa]), were studied using the universal mechanical testing machine INSTRON 3382 and compared with the mechanical characterization of the human bone.