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[\[Image PDF \(2109K\)\]](#) [\[References\]](#)**Effects of Sintering Temperature Over 1,300°C on the Physical and Compositional Properties of Porous Hydroxyapatite Foam**[Melvin L. MUNAR](#)<sup>1)</sup>, [Koh-ichi UDOH](#)<sup>1)</sup>, [Kunio ISHIKAWA](#)<sup>1)</sup>, [Shigeki MATSUYA](#)<sup>1)</sup>  
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**Abstract:**

Porous hydroxyapatite (HAP) foam permits three-dimensional (3D) structure with fully interconnecting pores as well as excellent tissue response and good osteoconductivity. It is therefore thought to be a good candidate as scaffold material for bone regeneration and as a synthetic bone substitute material. To fabricate better porous HAP foam, improved physical and structural properties as well as higher osteoconductivity are desired. In the present study, the effects of sintering temperature on the physical and compositional properties of porous HAP foam were evaluated by employing high sintering temperature starting at 1,300°C up to 1,550°C. The mechanical strength of porous HAP foam increased with sintering temperature to reach the maximum value at 1,525°C, then decreased slightly when sintering temperature was further increased to 1,550°C. Alpha tricalcium phosphate ( $\alpha$ -TCP) was formed, and thus the porous HAP foam became biphasic calcium phosphate. Biphasic calcium phosphate consisting of both  $\alpha$ -TCP and HAP had been reported to show higher osteoconductivity than HAP alone. We therefore recommend 1,500-1,550°C as the sintering temperature for porous HAP foam since this condition provided the most desirable physical properties with biphasic calcium phosphate composition.

**Key words:**[Porous hydroxyapatite](#), [Scaffold](#), [Synthetic bone substitute](#)



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