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[\[PDF \(614K\)\]](#) [\[References\]](#)**Superplastic Deformation in Carbonate Apatite Ceramics under Constant Compressive Loading for Near-net-shape Production of Bioresorbable Bone Substitutes**[Masanori ADACHI](#)<sup>1)</sup>, [Nobukazu WAKAMATSU](#)<sup>1)</sup> and [Yutaka DOI](#)<sup>1)</sup>

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**Abstract:**

To produce carbonate apatite (CAP) ceramics with the desired complex shapes using superplastic deformation, deformation behavior of CAP ceramics under constant loading as well as physical properties after deformation were evaluated. Sintered CAP ceramics were plastically deformed in an electric furnace attached to a universal hydraulic testing machine under a constant load. CAP ceramics subjected to an initial compressive pressure of 10 MPa showed an appreciable amount of plastic deformation at temperatures ranging from 720 to 800°C. Plastic deformation increased with increasing temperature from about 10% to 70% after two hours of loading. X-ray diffraction analysis and SEM observation further revealed that some CAP crystals were elongated and aligned with the c-axis normal to the loading direction during superplastic deformation. It was thus concluded that a marked plastic deformation of about 70% at 800°C would be sufficient for near-net-shape production of bioresorbable CAP bone substitutes with complex shapes.

**Key words:**[Carbonate apatite](#), [Superplasticity](#), [Near-net-shape production](#)[\[PDF \(614K\)\]](#) [\[References\]](#)Download Meta of Article [\[Help\]](#)

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