

# Turkish Journal of Medical Sciences



Turkish Journal  
of  
Medical Sciences

Biomimetic Preparation of HA Powders at 37° C in Urea-and Enzyme Urease-Containing Synthetic Body Fluids

Defne BAYRAKTAR

A. Cüneyt TAŞ

Department of Metallurgical and Materials  
Engineering, Middle East Technical University,  
Ankara 06531-TURKEY

 [Keywords](#)  
 [Authors](#)



[medsci@tubitak.gov.tr](mailto:medsci@tubitak.gov.tr)

[Scientific Journals Home Page](#)

**Abstract:** An important inorganic phase of synthetic bone applications, calcium hydroxyapatite (HA,  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ ), was prepared as a single-phase and sub-micron bioceramic powder. Carbonated HA powders were synthesized from calcium nitrate tetrahydrate and di-ammonium hydrogen phosphate salts dissolved in synthetic body fluid (SBF) solutions, containing urea ( $\text{H}_2\text{NCONH}_2$ ) and enzyme urease, under the biomimetic conditions of 37° C and pH 7.4, with a novel chemical precipitation technique. These powders were also found to contain trace amounts of Na and Mg ions in them, intentionally incorporated by using SBF solutions, instead of pure water, during their synthesis. The characterization and chemical analysis of the synthesized biomimetic HA powders were performed by scanning electron microscopy (SEM), powder X-ray diffraction (XRD), Fourier-transformed infra-red spectroscopy (FT-IR), and inductively-coupled plasma atomic emission spectroscopy (ICP-AES).

---

Turk J Med Sci 2000; **30**(3): 235-246.

Full text: [pdf](#)

Other articles published in the same issue: [Turk J Med Sci, vol.30,iss.3.](#)