

# Synthesis and Characterization of Hydroxyapatite Nanoparticles Using Blood Plasma

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Hydroxyapatite, (HA,  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ ) is an important biomaterial because of its unique characteristics and biocompatibility. Many researches related to HA synthesis for biomedical applications have been reported in literature. However, if biological-like HA can be synthesised, that is more advantageous for biomedical applications. There are only few studies related to synthesis of biological-like HA nanoparticles. Therefore, novel, one-pot, wet chemical method was used to synthesize HA nanoparticles using simple calcium and phosphate precursors in the medium of blood plasma and a protein blood plasma under the physiological pH and temperature. As synthesised HA was characterized using Fourier-Transform Infra-Red technique (FTIR), Scanning Electron Microscopy (SEM), Powder X-Ray Diffraction spectroscopy (XRD) and Energy Dispersive X-Ray (EDX) spectroscopy. As synthesised HA using a protein blood plasma is similar to the biological apatites by the nano size and the chemical composition-like presence of Na, Mg, Cl, K traces and non-stoichiometric HA in the carbonated form. The HA synthesised in blood plasma may be interfered due to the presence of proteins or absence of any other factor/s for bone formation. Therefore, biological-like HA nanoparticles can be synthesised by a novel facile wet chemical method using the medium a protein blood plasma. The synthesised HA may have improved biological properties when compared with the synthetic stoichiometric HA.

**Keywords:** Hydroxyapatite, Wet chemical synthesis, Blood plasma