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# Synthesis of Hydroxyapatite Nanoparticles Using Surface Carboxyl-functionalized Carbon Dots as Template

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## Abstract

Carbon dots (CDs), which are discrete, nearly spherical nanoparticles with sizes below 10 nm and large amounts of carboxylic acid moieties on the surface, have been proposed as an ideal template candidate for heterogeneous nucleators to regulate hydroxyapatite (HAp) nucleation and growth. In this paper, small HAp nanoparticles formed on carboxyl-functionalized CDs in situ were fabricated *via* the hydrothermal method. Investigation for the corresponding morphologies and detailed formation mechanisms of samples were conducted by Fourier transform infrared spectroscopy (FTIR), X-ray photoelectron spectroscopy (XPS), transmission electron microscopy (TEM), high-resolution transmission electron microscopy (HR-TEM) and Rietveld refinement. The optimum size and crystallinity of HAp particle had been obtained in

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