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[\[Image PDF \(1264K\)\]](#) [\[References\]](#)**Detailed Consideration of Physicochemical Properties of CO₃apatites as Biomaterials in Relation to Carbonate Content Using ICP, X-ray Diffraction, FT-IR, SEM, and HR-TEM**[Rie YOKOTA](#)¹⁾, [Hidetaka HAYASHI](#)¹⁾, [Isao HIRATA](#)¹⁾, [Yasuo MIAKE](#)¹⁾, [Takaaki YANAGISAWA](#)²⁾ and [Masayuki OKAZAKI](#)¹⁾

1) Department of Biomaterials Science, Graduate School of Biomedical Sciences, Hiroshima University

2) Department of Ultrastructural Science, Tokyo Dental College

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Abstract:

CO₃apatites with different carbonate contents were synthesized at 60±1°C and pH 7.4±0.2 under different carbonate concentrations (0-0.3 mol/L) in the supplied solutions. Their physicochemical properties were analyzed using various methods. Inductively coupled plasma gave accurate chemical analysis data for calcium and phosphate contents. X-ray diffraction analysis showed a clear chemical shift at high carbonate content. A CO₃²⁻ absorption peak area approximately proportional to carbonate content was observed through Fourier transmission infrared spectroscopy. Scanning electron microscopy and high-resolution transmission electron microscopy revealed a dramatic change of the crystal shape. Osteoblast proliferation at the surface of each CO₃apatite-collagen sponge indicated that osteoblasts deformed to expand and cover the surface of the sponge, and appeared to adhere well to the sponge.

Key words:[CO₃apatites](#), [Carbonate contents](#), [Detailed analyses](#)



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