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Multifunctional Bioceramic-based Composites Reinforced with Silica-coated Carbon Nanotube Core-shell Structures

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ABSTRACT

Carbon nanotube (CNT) possesses eminent mechanical properties and has been widely utilized to toughen bioceramics. Major challenges associated with CNT-reinforced bioceramics include the inhomogeneous dispersion of CNTs and the insufficient interfacial strength between the two phases. To address such issues, this research describes the first use of silica-coated CNT (S-CNT) core-shell structures to reinforce bioceramics using hydroxyapatite (HA) as a representative matrix. HA-based composites with 0.1–2 wt.% S-CNT are sintered by spark plasma sintering to investigate their mechanical and biological properties. It is found that when

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