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CHARLES E. SCHMIDT COLLEGE OF SCIENCE

Preparation and characterization of fSWCNT/HAp-nylon hybridized composite biomaterial and mechanical testing

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Synthetic hydroxyapatite HAp bears poor mechanical properties that limit its applicability in orthopedics. We study the possibility of overcoming such limitations by incorporating functionalized single walled carbon nanotube fSWCNT and polymerized ϵ -caprolactam. Sonication method was used to disperse fSWCNT in the HAp. A simple hot blending method was used to incorporate HAp/fSWCNT powder with melted polymerized ϵ -caprolactam. The fracture toughness of the composite material was tested in compliance with ASTM D-5045 standard. A critical stress intensity factor K_{1C} of the composite material was found to be 3.55 MPa.m^{1/2}, which is a value comparable to the one for cortical bone.