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Authors: T Hanas, T.S. Sampath Kumar, Govindaraj Perumal, Mukesh Doble, Seeram Ramakrishna



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Electrospun PCL/HA coated friction stir processed AZ31/HA composites for degradable implant applications

T Hanas ^{a,b}, T.S Sampath Kumar ^{a*}, Govindaraj Perumal ^c, Mukesh Doble ^c and

Seeram Ramakrishna ^d

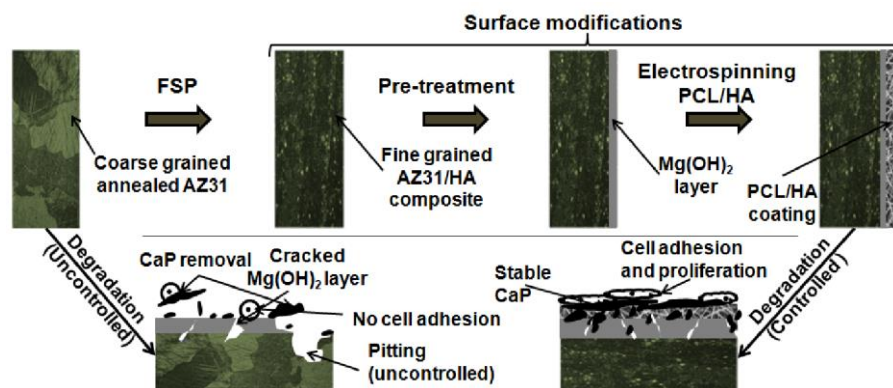
^a Medical Materials Laboratory, Indian Institute of Technology Madras, Chennai 600036, India.

^b School of Nano Science and Technology, National Institute of Technology Calicut, Calicut, Kerala 673601, India.

^c Department of Biotechnology - Bhupat and Jyoti Mehta School of Biosciences, Indian Institute of Technology Madras, Chennai 600036, India.

^d Center for Nanofibers and Nanotechnology, Department of Mechanical Engineering, Faculty of Engineering, National University of Singapore, 117575, Singapore

Graphical abstract



ABSTRACT

Hydroxyapatite (HA) nanoparticles were dispersed in AZ31 alloy by friction stir processing (FSP) to produce AZ31/HA metal matrix composites. The composite surface was acid treated using HNO₃ and coated with polycaprolactone/HA (PCL/HA) mat by electrospinning. Coating parameters were optimized to obtain PCL/HA nanocomposite fibrous mat with an adhesion strength of 4B Grade (ASTM D3359-09 tape test) on AZ31/HA composite surface. Presence of HA on the substrate and in the coating helps in enhancing biomineralization and develop thick CaP layer on the surface which also facilitates controlled degradation in simulated body fluid at normal physiological conditions of pH 7.2 and 37°C. Rat skeletal muscle cells culture study

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