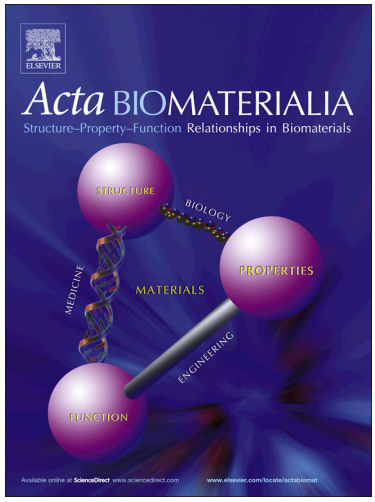

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Xuan Li, Chenxi Qi, Linyuan Han, Chenglin Chu, Jing Bai, Chao Guo, Feng Xue, Baolong Shen, Paul K. Chu

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Influence of dynamic compressive loading on the i*n vitro* degradation behavior of pure PLA and Mg/PLA composite

Xuan Li[1,2,3], Chenxi Qi[1,2], Linyuan Han[1,2], Chenglin Chu[1,2,*], Jing Bai[1,2], Chao Guo[1,2], Feng Xue[1,2], Baolong Shen[1,2], Paul K. Chu[3,*]

[1] School of Materials Science and Engineering, Southeast University, Nanjing, 211189, China

[2] Jiangsu Key Laboratory for Advanced Metallic Materials, Southeast University, Nanjing, 211189, China

[3] Department of Physics and Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, China

Abstract

The effects of dynamic compressive loading on the *in vitro* degradation behavior of pure poly-lactic acid (PLA) and PLA-based composite unidirectionally reinforced with micro-arc oxidized magnesium alloy wires (Mg/PLA) are investigated. Dynamic compressive loading is shown to accelerate degradation of pure PLA and Mg/PLA. As the applied stress is increased from 0.1 MPa to 0.9 MPa or frequency from 0.5 Hz to 2.5 Hz, the overall degradation rate goes up. After immersion for 21 days at 0.9 MPa and 2.5 Hz, the bending strength retention of the composite and pure PLA is 60.1% and 50%, respectively. Dynamic loading enhances diffusion of small acidic molecules resulting in significant pH decrease in the immersion solution. The synergistic reaction between magnesium alloy wires and PLA in the composite is