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# Simultaneous improvement in toughness, strength and biocompatibility of poly(lactic acid) with polyhedral oligomeric silsesquioxane

Zhibin Liu, Duo Hu, Lin Huang, Wenqiang Li, Jinhuan Tian, Lu Lu\*, Changren Zhou

Department of Materials Science and Engineering, Jinan University, Guangzhou

510632, China

Corresponding author: Tel.: +86-020-85226663. Fax: +86-020-85223271

E-mail address: tlulu@jnu.edu.cn (L. Lu)

## Abstract

Poly(lactic acid) (PLA), a considerable biopolymer, suffers from the significant brittleness, which is one of its main limitations for industrial use or for biomedical applications. Introducing nanofillers represents a promising way to extend and to improve the performance of a polymer matrix. In this study, a series of octa-armed polyhedral oligomeric silsesquioxanes (POSS-(PLLA)<sub>8</sub>) were developed to introduce amount of poly(L-lactide) (PLLA) arms onto the POSS particles. Then PLLA/POSS-(PLLA)<sub>8</sub> nanocomposites were prepared via solvent casting technique. By combining the PLLA arms onto POSS particles, the interfacial interaction between PLLA and POSS can be significantly improved and the stereocomplexed crystal are

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