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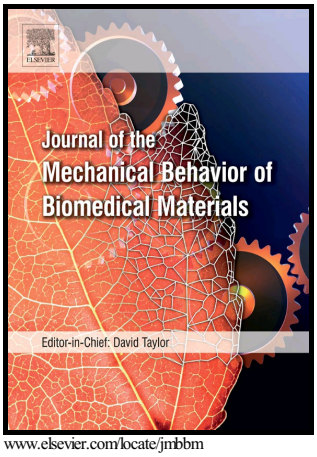

www.elsevier.com/locate/jmbbm

PII: S1751-6161(18)30908-1
DOI: https://doi.org/10.1016/j.jmbbm.2018.09.001
Reference: JMBBM2966

To appear in: *Journal of the Mechanical Behavior of Biomedical Materials*

Received date: 17 June 2018
Revised date: 31 August 2018
Accepted date: 2 September 2018

Cite this article as: Arman Jafari, Shadi Hassanajili, Mohammad Bagher Karimi, Amir Emami, Farnaz Ghaffari and Negar Azarpira, Effect of organic/inorganic nanoparticles on performance of polyurethane nanocomposites for potential wound dressing applications, *Journal of the Mechanical Behavior of Biomedical Materials,* https://doi.org/10.1016/j.jmbbm.2018.09.001

Effect of organic/inorganic nanoparticles on performance of polyurethane nanocomposites for potential wound dressing applications

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Abstract

This study focuses on the evaluation and modification of polyurethane (PU) membranes containing organic and inorganic nanoparticles for potential use as a wound dressing. For the purpose of PU nanocomposite preparation, chitosan (CS) was converted into nanoparticles by the ionic-gelation method to improve its blending capability with the PU matrix. These CS nanoparticles (nano-CS) were obtained as a hyrdophilic organic filler with different contents and were utilized along with inorganic titanium dioxide (TiO_2) nanoparticles in the nanocomposite membrane preparation. The membranes were prepared using phase inversion technique and their microstructure was controlled by manipulating the solvent non-solvent exchange rate. Obtained results demonstrate that addition of polymer solvent to nonsolvent induced a microstructure alteration from finger-like to sponge-like, which is more suitable for fluid uptake and