

Accepted Manuscript

Fabrication and Process Investigation of Vancomycin Loaded Silica Xerogel/Polymer Core-shell composite Nanoparticles for Drug Delivery

W.F. Huang, Gary C.P. Tsui, C.Y. Tang, M. Yang



PII: S1359-8368(16)30240-2

DOI: [10.1016/j.compositesb.2016.04.016](https://doi.org/10.1016/j.compositesb.2016.04.016)

Reference: JCOMB 4214

To appear in: *Composites Part B*

Received Date: 3 November 2015

Revised Date: 22 February 2016

Accepted Date: 5 April 2016

Please cite this article as: Huang WF, Tsui GCP, Tang CY, Yang M, Fabrication and Process Investigation of Vancomycin Loaded Silica Xerogel/Polymer Core-shell composite Nanoparticles for Drug Delivery, *Composites Part B* (2016), doi: 10.1016/j.compositesb.2016.04.016.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Fabrication and Process Investigation of Vancomycin Loaded Silica Xerogel/Polymer Core-shell composite Nanoparticles for Drug Delivery

¹W.F. Huang, *¹Gary C.P. Tsui, ¹C.Y. Tang, ²M. Yang

¹Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University,
Hung Hom, Kowloon, Hong Kong, China

²Interdisciplinary Division of Biomedical Engineering, The Hong Kong Polytechnic
University,

Hung Hom, Kowloon, Hong Kong, China

*Corresponding author: E-mail address: mfgary@polyu.edu.hk

Abstract

Biodegradable polymer-inorganic composites particles can provide significant advantages while avoiding the shortcomings of using polymer or inorganic particles alone as drug delivery vehicles. Most of the existing fabrication methods for polymer nanoparticles and silica xerogel nanoparticles are not applicable for composite nanoparticles. To overcome these difficulties, a novel sol-gel emulsion polymerization method was successfully developed through the integration of sol-gel and modified double emulsion processes, in which gelation of the silica solution was enabled in nanodroplets generated in the modified emulsion process. Spherical vancomycin loaded silica xerogel/polymer core-shell composite nanoparticles with a tunable size and good drug encapsulation efficiency were fabricated through this novel method. By changing the process variables of the modified double emulsion process in terms of the second sonication time and PVA concentration, the average diameter of the composite nanoparticles could be adjusted in the range of 192~569

Download English Version:

<https://daneshyari.com/en/article/7212679>

Download Persian Version:

<https://daneshyari.com/article/7212679>

[Daneshyari.com](https://daneshyari.com)