

Accepted Manuscript

Thermal and kinetic evaluation of biodegradable thermo-sensitive gelatin/poly(ethylene glycol) diamine crosslinked citric acid hydrogels for controlled release of tramadol

Denisse Rocha-García, Antonio Guerra-Contreras, Jaime Reyes-Hernández, Gabriela Palestino

PII: S0014-3057(16)31070-9
DOI: <http://dx.doi.org/10.1016/j.eurpolymj.2017.02.007>
Reference: EPJ 7708

To appear in: *European Polymer Journal*

Received Date: 12 September 2016
Revised Date: 3 February 2017
Accepted Date: 6 February 2017

Please cite this article as: Rocha-García, D., Guerra-Contreras, A., Reyes-Hernández, J., Palestino, G., Thermal and kinetic evaluation of biodegradable thermo-sensitive gelatin/poly(ethylene glycol) diamine crosslinked citric acid hydrogels for controlled release of tramadol, *European Polymer Journal* (2017), doi: <http://dx.doi.org/10.1016/j.eurpolymj.2017.02.007>

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.



Thermal and kinetic evaluation of biodegradable thermo-sensitive gelatin/poly(ethylene glycol) diamine crosslinked citric acid hydrogels for controlled release of tramadol

Denisse Rocha-García^a, Antonio Guerra-Contreras^a, Jaime Reyes-Hernández^b, Gabriela Palestino^{a,*}

^aBiopolymers and Nanostructures Laboratory, Faculty of Chemical Sciences, Universidad Autónoma de San Luis Potosí, Manuel Nava No. 6, C.P. 78210, San Luis Potosí, México.

^bFaculty of Nursing, Universidad Autónoma de San Luis Potosí, Av. Manuel Nava No. 6, CP 78210, San Luis Potosí, México.

*E-mail corresponding author: palestinogabriela@fcq.uaslp.mx

Keywords: Hydrogel, drug release, tramadol, biocompatible, biodegradable

Abstract

Nowadays, hydrogels have become ideal materials for use in biomedical applications by virtue of their biodegradability and biocompatibility. In this study, poly(ethylene glycol) diamine (PEGD) based hydrogels were synthesized using as crosslinking agents citric acid (CA) or glutaraldehyde (GTA), and gelatin (GEL) as hydrogel vehicle. The hydrogels were studied for drug release in vitro using tramadol (TR) as a model drug. Thermal studies under isothermal and non-isothermal conditions were conducted. The elastic module (G') showed higher values than the loss module (G'') confirming that the contribution of the elastic segments in both materials is more significant than the viscous ones. Aqueous stability, swelling and drug release properties were determined. The swelling analysis indicated that both hydrogels are temperature dependent. The kinetics studies showed an anomalous drug release mechanism. PEGD:CA/GEL hydrogel behave as an elastic matrix strong enough to maintain the drug dosage.

Download English Version:

<https://daneshyari.com/en/article/5159194>

Download Persian Version:

<https://daneshyari.com/article/5159194>

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