

Accepted Manuscript

Fast synthesis of poly(ethylene glycol) diacrylate cryogels via UV irradiation

Marta Madaghiele, Luca Salvatore, Christian Demitri, Alessandro Sannino

PII: S0167-577X(18)30254-4
DOI: <https://doi.org/10.1016/j.matlet.2018.02.048>
Reference: MLBLUE 23874

To appear in: *Materials Letters*

Received Date: 8 January 2018
Revised Date: 2 February 2018
Accepted Date: 11 February 2018



Please cite this article as: M. Madaghiele, L. Salvatore, C. Demitri, A. Sannino, Fast synthesis of poly(ethylene glycol) diacrylate cryogels via UV irradiation, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.02.048>

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.

Fast synthesis of poly(ethylene glycol) diacrylate cryogels via UV irradiation

Marta Madaghiele^{1*}, Luca Salvatore¹, Christian Demitri¹, Alessandro Sannino¹

¹Department of Engineering for Innovation, University of Salento, Via per Monteroni,

Lecce 73100, Italy

*Corresponding author: marta.madaghiele@unisalento.it

ABSTRACT

Poly(ethylene glycol) diacrylate (PEGDA) cryogels, particularly useful for biotechnological applications, are currently fabricated exploiting crosslinking systems that require long freezing/crosslinking times (20 hours or longer). The aim of this work was to assess whether fast UV irradiation (up to 60 seconds) of frozen PEGDA solutions could be an advantageous alternative for cryogel production. By using different polymer concentrations and UV times, cryogels with highly interconnected macropores (about 50-90 μm) were produced. A gelation yield in the range 60-80% was recorded, with higher values obtained for low PEGDA concentrations (5 and 10% w/v). Interestingly, while decreasing the swelling and increasing the stiffness of the cryogels, a higher polymer concentration was also found to reduce the pore size. Furthermore, increasing the UV time resulted in significantly higher swelling and larger pores for 10% PEGDA samples, while having negligible effect on other cryogel types and/or features. Although deserving further exploration, fast UV irradiation is an effective method to produce PEGDA cryogels with tunable properties.

Keywords: biomaterials; porous materials; cryogel; stiffness

Download English Version:

<https://daneshyari.com/en/article/8014147>

Download Persian Version:

<https://daneshyari.com/article/8014147>

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