Accepted Manuscript

Title: Fabrication of patterned calcium cross-linked alginate hydrogel films and coatings through reductive cation exchange

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PII: S0144-8617(15)00420-8

DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2015.05.021

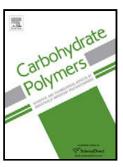
Reference: CARP 9925

To appear in:

Received date: 14-2-2015 Revised date: 29-4-2015 Accepted date: 5-5-2015

Please cite this article as: Bruchet, M.,Fabrication of patterned calcium cross-linked alginate hydrogel films and coatings through reductive cation exchange, *Carbohydrate Polymers* (2015), http://dx.doi.org/10.1016/j.carbpol.2015.05.021

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ACCEPTED MANUSCRIPT

- 1 Fabrication of patterned calcium cross-linked alginate hydrogel films and coatings through
- 2 reductive cation exchange
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- 11 Abstract: Calcium cross-linked alginate hydrogels are widely used in targeted drug delivery, tissue
- 12 engineering, wound treatment, and other biomedical applications. We developed a method for preparing
- 13 homogeneous alginate hydrogels cross-linked with Ca²⁺ cations using reductive cation exchange in
- 14 homogeneous iron(III) cross-linked alginate hydrogels. Treatment of iron(III) cross-linked alginate
- 15 hydrogels with calcium salts and sodium ascorbate results in reduction of iron(III) cations to iron(II) that
- are instantaneously replaced with Ca²⁺ cations, producing homogeneous ionically cross-linking hydrogels.
- 17 Alternatively, the cation exchange can be performed by photochemical reduction in the presence of
- 18 calcium chloride using a sacrificial photoreductant. This approach allows fabrication of patterned calcium
- 19 alginate hydrogels through photochemical patterning of iron(III) cross-linked alginate hydrogel followed
- 20 by the photochemical reductive exchange of iron cations to calcium.

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