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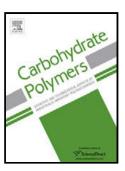
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ACCEPTED MANUSCRIPT

1 Electrospun alginate nanofibres impregnated with silver nanoparticles:

2 Preparation, morphology and antibacterial properties

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11 12

- Abstract
- 13 Silver nanoparticles are amongst the most valuable nanoparticles with interesting properties,
- such as a non-toxic nature and high antibacterial efficiency, making them applicable for tissue
- scaffold, protective clothing and wound dressing. In this study, silver nanoparticles (AgNPs)
- have been synthesized using chitosan as reducing and stabilizing agent. The formation of
- silver nanoparticles was confirmed by UV-vis, and the TEM showed that different shapes
- were obtained depending on the heating duration. The chitosan/AgNPs was coated onto an
- 19 electrospun alginate membrane to produce stable polyelectrolyte complex (PEC) nanofibre
- 20 composites with high antibacterial efficiency. These composites were characterized by
- scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR) and X-
- 22 ray diffraction (XRD). AgNPs were successfully impregnated into the PEC nanofibre
- 23 composite, while there was complexation between the electrospun alginate and the
- 24 chitosan/AgNPs composite. PEC demonstrated a good antibacterial activity against both gram
- 25 negative and gram positive bacteria with acceptable water vapour transmission within the
- 26 range required for the treatment of injuries or wounds.

27

- 28 **Keywords**: Chitosan; Silver nanoparticles; Electrospun alginate; Polyelectrolyte complex;
- 29 Antibacterial activity

30

- 31 Chemical compounds studied in this article: Calcium chloride (PubChem CID: 5284359);
- 32 Acetic acid (PubChem CID:176); Dimethylsulfoxide (PubChem CID: 24893881); TritonTM-
- 33 X100 (PubChem CID: 24889888); Poly(ethylene oxide) (PubChem CID: 24863166)

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