

Zein/HPMC-AS nanofibers containing metronidazole benzoate formed by electrospinning

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Electrospinning is a versatile technology that allows the fabrication of micro/nanofibers from polymeric solutions, which can be applied to a wide range of materials and processes such as reinforcing composite, air and water filtration, sensors, multifunctional membranes for wound dressing and drug release [1]. Thus, this work presented the production of micro/nanofibers by the electrospinning technique from polymeric solutions of Zein and hydroxypropylmethylcellulose acetate succinate (HPMC-AS) with proportions of Zein/HPMC-AS 3:2, 1:1 and 2:3. Metronidazole benzoate (BMDZ) was incorporated to fibers in order to investigate the modified release of drug for oral disease treatment. The fibers were characterized by infrared (IR), X-ray diffraction (XDR), thermal analysis and scanning electron microscopy (SEM). XDR spectra indicated semicrystalline fibers, with a higher definition of the peak at approximately 23° due to the presence of BMDZ. Micrographs showed smooth cylindrical nanofibers with average diameter of 647 ± 127 nm without defects, such as beads and nanospheres. There is no evidence of phase separation, indicating a good intermolecular interaction among the two polymers and the drug.

[1] J. Xue, T. Wu, Y. Dai, Y. Xia, Electrospinning and electrospun nanofibers: methods, materials and applications. Chemical Reviews 2019 (119) 5298.

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