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Potential electrospun Chitosan/Polyvinyl alcohol/Cyclophosphamide nanofibers for anticancer applications

Neda Abdi[a], **Niloufar dorosti** [*,a]

[a]*Faculty of Chemistry, Lorestan University, Khorram Abad, Iran*

E-mail: dorosti.n@lu.ac.ir, nilufardorosti@gmail.com

Recently, electrospun polymeric nanofibers have proven to be an interesting strategy for drug delivery systems application. The high surface-to-volume ratio of the fibers can improve some processes, such as, drug loading. One of the most important and studied areas of electrospinning is in the drug delivery field, for the controlled release of anticancer agents. Different drugs can be easily incorporated in electrospun materials and their release profile can be controlled through changes in the fibers morphology, porosity and composition. Therefore, nanofibers can be promising materials for many biomedical applications such as anticancer drugs [1]. Chitosan (C.S) has proven challenging to electrospun. Polyvinilalchol (PVA) is a polymer that has been studied intensively because of its good film forming and physicalproperties. To improve mechanical properties, C.S/PVA composite by electrospun method has challenging [2, 3]. requirement in the fields of medicine and drug deliveryCyclophosphamide (CP) is an important anticancer drug which belongs to the class of alkylating agents. (CP) is mostly used in bone marrow transplantation, rheumatoid arthritis, lupus erythematosus, multiple sclerosis, neuroblastoma and other types of cancer [4].

Bycombining the advantage of electrospun nanofibers (PVA/C.S) and CP, we synthesis a new carrier system consist of nanofiber (C.S/PVA/CP). The physicochemical properties of nanofiber were characterized by Infrared spectroscopy (IR), Scanning Electron Microscopy (SEM-EDX), Ultraviolet-Visible spectroscopy (UV-VIS), and X-ray diffraction. Finally, the results showed that the drug was loaded on the nanofibers in a nano scale with a sepherical morphology.

Keyword: Chitosan, Polyvinyl alcohol, Nano fiber, Electrospining, Cyclophosphamide

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