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A review on chitin dissolution as preparation for electrospinning application

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Abstract
Electrospinning has been acknowledged as an efficient technique for the fabrication of continuous nanofibers from polymeric based materials such as polyvinyl alcohol (PVA), cellulose acetate (CA), chitin nanocrystals and others. These nanofibers exhibit chemical and mechanical stability, high porosity, functionality, high surface area and one-dimensional orientation which make it extremely beneficial in industrial application. In recent years, research on chitin - a biopolymer derived from crustacean and fungal cell wall - had gained interest due to its unique structural arrangement, excellent physical and chemical properties, in which make it biodegradable, non-toxic and biocompatible. Chitin has been widely utilized in various applications such as wound dressings, drug delivery, tissue engineering, membranes, food packaging and others. However, chitin is insoluble in most solvents due to its highly crystalline structure. An appropriate solvent system is required for dissolving chitin to maximize its application and produce a fine and smooth electrospun nanofiber. This review focuses on the preparation of chitin polymer solution through dissolution process using different types of solvent system for electrospinning process. The effect of processing parameters also discussed by highlighting some representative examples. Finally, the perspectives are presented regarding the current application of electrospun chitin nanofibers in selected fields.

Author Keywords
Chitin dissolution; Electrospinning; Nanofibers

Index Keywords
Biocompatibility, Biopolymers, Chemical stability, Chitin, Dissolution, Drug delivery, Electrospinning, Solvents, Tissue engineering; Cellulose acetates, Chitin dissolution, Fungal cell walls, High porosity, High surface area, Non-toxic, One-dimensional, Physical and chemical properties, Solvent system, Structural arrangement; Nanofibers; biopolymer, cellulose acetate, chitin, deep eutectic solvent, inorganic acid, inorganic salt, ionic liquid, nanocrystal, nanofiber, organic solvent, polyvinyl alcohol, polymer, solvent; aqueous solution, biocompatibility, biodegradability, crystal structure, dissolution, drug delivery system, electrospinning, food packaging, fungal cell wall, human, nonhuman, Review, scanning electron microscopy, tissue engineering, waste water management, chemistry, procedures, tissue engineering; Application, Chemical Properties, Chitin, Dissolving, Processing, Review, Solvents; Chitin, Polymers, Polyvinyl Alcohol, Solvents, Tissue Engineering

Chemicals/CAS
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