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Development of electrospayed mucoadhesive chitosan microparticles

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Highlights

- Chitosan solution properties; the effect of acetic acid and ethanol content on conductivity and viscosity of solutions.
- Stable electrospayed chitosan particles
- Mucoadhesive electrospayed chitosan particles for oral drug delivery applications

Abstract

The efficacy of chitosan (CS) to be used as drug delivery carrier has previously been reported. However, limited work has been pursued to produce stable and mucoadhesive CS electrospayed particles for oral drug delivery, which is the aim of this study. Various CS types with different molecular weight (MW), degree of deacetylation (DD), and degree of polymerization (DP) were assessed. In addition, the effect of the solvent composition was also investigated. Results showed that stable CS electrospayed particles can be produced by dissolving 3 % w/v of low MW CS in mixtures of aqueous acetic acid and ethanol (50/50 % v/v). The stable CS particles displayed diameters of approximately 1 μm as determined by dynamic light scattering. The zeta potential of these particles was found to be approximately 40 mV confirming the mucoadhesion properties of these CS electrospayed particles and its potential to be used as drug delivery carrier.

Keywords

Electrospray; Microparticles; Chitosan; Mucoadhesion; Electrohydrodynamics; Polysaccharide

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