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Effects of chitosan quaternary ammonium salt on the physicochemical properties of sodium carboxymethyl cellulose-based films

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Highlights of the work:

- HTCC/CMC solutions showed shear-thinning behavior and typical pseudoplasticity.
- At mass ratio of 10.0 %, HTCC and CMC molecules showed the strongest synergies.
- HTCC improved mechanical strength and hydrophobicity of CMC-based films notably.

Abstract

The effects of *N*-(2-hydroxyl)-propyl-3-trimethylammonium chitosan chloride (HTCC) on the physicochemical properties of sodium carboxymethyl cellulose (CMC)-based films were investigated. The prepared HTCC/CMC film-forming solutions (FFSs) with varying mass ratios exhibited shear-thinning behavior and typical pseudoplasticity. The highest apparent viscosity and lowest crossover frequency was obtained for the HTCC/CMC FFS with a mass ratio of 10%, due to the formation of the strongest intermolecular interactions, which also led to the best mechanical properties. Furthermore, the effects of temperature and degree of substitution of HTCC on the composite film properties were also investigated.

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