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Physicochemical characterization of polyelectrolyte complex blends of aloe vera gel, chitosan and alginate

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Chitosan (CH), alginate (ALG) and aloe vera (*Aloe barbadensis*) Miller (AV) have applications in ice cream, beverages, syrup, dressing, bread making, meat products as thickening agents and as packaging materials. In this study polyelectrolyte complexes (PECs) with CH-ALG-AV were prepared at pH 4 and 6 using two types of CH, obtained by N-deacetylation of chitins extracted by biological method (BCH) and chemical method (QCH). pH was selected considering food applications and stability of AV. PECs were characterized using analysis of the FT-IR spectroscopy, which electrostatic interaction among AV, ALG, and CH were evidenced at 1595 cm⁻¹. The formation of PEC was also corroborated by fluorescence microscopic analysis by using calcofluor white reagent that interact with 1,4-β-glucans as CH and induced fluorescence. Zeta potential measurements in PECs indicated polyanionic surface charge in the range of -20 to -24 mV, which suggested a stable system. The dynamic moduli exhibited a high dependence on angular frequency typical of macromolecular solutions. PECs morphologies were analyzed by scanning electron microscopy, which showed rough and lamellar structures of PEC at pH 4 and 6. The prepared PECs have potential application for formulation of nutraceutical foods.

Biography

Gallardo-Rivera R is currently pursuing his PhD in Biotechnology in the group of Biopolymers and Bioprocess of Agro-Industrial and Food By-products at Universidad Autónoma Metropolitana Campus Iztapalapa, under the supervision of full time Professor Dr. Keiko Shirai.

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