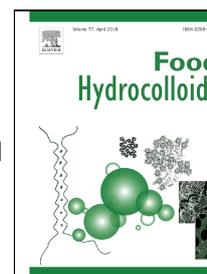


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Physicochemical properties of alginate-based films: effect of ionic crosslinking and mannuronic and guluronic acid ratio



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13

14 **Abstract**

15 The use of alginates as films in food applications has increased in the recent years due
16 to their swelling capacity and overall functionality. This behaviour is a result of their
17 capacity to crosslink with Ca²⁺ ion. Aiming to fully understand the effect of calcium
18 chloride (CaCl₂) crosslinking and the mannuronic (M) and guluronic (G) acid ratio
19 (M/G) of alginate structure in the films' properties, alginate-based films with different
20 (M/G) ratios were crosslinked at increasing CaCl₂ concentrations. Films were produced
21 by casting, and characterized in terms of mechanical properties (tensile strength and
22 elongation-at-break), opacity, water sensitivity (moisture content, solubility and water
23 vapour permeability) and morphology, evaluated by scanning electronic microscopy
24 (SEM). Chemical interactions were studied by Fourier Transform Infrared
25 Spectroscopy (FTIR) to assess possible chemical modifications of alginate-based films
26 after crosslinking. Crosslinking significantly affected the alginate structure and

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