

Mechanical properties and Antioxidant activity of Carrageenan-CNF Film Incorporated with Butylated Hydroxyanisole (BHA) as Active Food Packaging

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Abstract

Incorporated BHA in biopolymer film is one of strategy to minimize the direct contact of BHA into the food product without limits their function as food preservative. Thus, the aim of this study was to formulate the active packaging film using semi refined carrageenan (SRC) biopolymer plasticized with glycerol (G), reinforced with 10% v/v CNF and incorporates antioxidant agent (BHA) with different concentrations (0.1 to 0.5% v/v) as antioxidants. Physical properties (thickness, opacity measurement, moisture content and solubility in water) and mechanical properties (tensile strength (TS) and elongation at break (EAB)) were analyzed. Active SGC-BHA films improved overall the tensile strength and the value of elongation at break significantly. Opacity, thickness, water solubility and moisture content were improved with increasing concentration of BHA in the film samples. Active SGC-BHA films showed highest improvement on the mechanical properties due to the uniform dispersion between CNF-SRC matrix interactions. Hence, the new formulation of active SGC-BHA films may be an alternative plastic packaging not only to avoid the direct contact of synthetic preservative on to food products but also can prolong the shelf life.

Keywords: Butylated hydroxyanisole; Food preservative; Semi-refined carrageenan; Mechanical and physical properties; Plastic packaging.