



Thermal, mechanical and optical characterization of calcium caseinate biopolymers with borax as crosslinking agent

Franco-Bacca AP⁽¹⁾, Cervantes-Alvarez F^{(1)*}, Becerra ME⁽²⁾, Ávila AC⁽²⁾, Giraldo Osorio O⁽³⁾, Arias NP⁽⁴⁾, Rodríguez-Gattorno G^{(1)*}, J. J. Alvarado-Gil G^{(1)*}

(1) Departamento de Física Aplicada, Cinvestav-Unidad Mérida, Carretera Antigua a Progreso Km. 6, Mérida, Yucatán, México, 97310, México

(2) Departamento de Ingeniería Química, Facultad de Ingeniería y Arquitectura, Universidad Nacional de Colombia-Sede Manizales, Kilómetro 9 vía al aeropuerto, La Nubia, Manizales 170003, Colombia

(3) Departamento de Física y Química, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Colombia-Sede Manizales, Kilómetro 9 vía al aeropuerto, La Nubia, Manizales 170003, Colombia

(4) Facultad de Ingeniería, Universidad de Sucre, Carrera 28 No. 5-267, Sincelejo 70003, Sucre, Colombia

*Corresponding authors' emails: fernando.cervantes@cinvestav.mx, geonelr@cinvestav.mx, juan.alvarado@cinvestav.mx

Calcium caseinate is a low-cost and biocompatible protein. Calcium caseinate biofilms show suitable mechanical properties, and they are helpful as a barrier to protect food from oxygen, slowing down its degradation. This study is aimed to characterize calcium caseinate biodegradable films by adding borax at different concentrations to improve their physical properties. The results of the thermal diffusivity, measured with photothermal radiometry, showed that the increase in borax concentration favors thermal transport until reaching a saturation point at 1.40% volume fraction concentration. The mechanical properties, tested with a mechanic stress machine, do not show a significant increase for borax concentrations greater than 1.00% volume fraction. Additionally, UV-Vis spectroscopy showed that the addition of borax increases the percentage of transmitted light. These results open the possibility of using biodegradable films of calcium caseinate with borax added as material packaging to extend shelf life and quality of perishables, maintaining their quality, in specially those which must be kept in refrigeration and protected them from microbial contamination, delaying their deterioration.

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