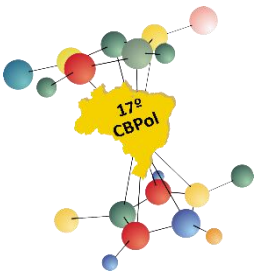

EFFECT OF ALGINATE ADDITION ON THE PHYSICOCHEMICAL PROPERTIES OF CHITOSAN FILMS

Andressa E. Sobczyk[1*], Júlia M.F. Pavoni[1], Cláudia L. Luchese[1], Débora J. L. Faccin[1], Nilo S. M. Cardozo[1], Isabel C. Tessaro[1]

1 – Department of Chemical Engineering, Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil
*andressa.enq@gmail.com

Abstract - Biodegradable polymers from renewable sources are gaining prominence in the biomedical area, mainly for application as dressings, since they can act as partial substitutes for some non-biodegradable synthetic materials used in this area. Chitosan is a biodegradable biopolymer with various applications due to its functional properties, such as antibacterial activity and non-toxicity. However, it has high hydrophilicity, and the films produced from this macromolecule present a high degree of swelling when in contact with water, hindering its use in some applications. There are alternatives to overcome these limitations, including its combination with biopolymers of different characteristics to achieve the desired properties in the final material. This work aimed to evaluate the influence of alginate incorporation on the physicochemical properties of chitosan films prepared by casting. The polymeric solutions were made separately, with chitosan solubilized in an acid medium (lactic acid solution, 1% v/v) and alginate in water. The two solutions were mixed to obtain composite chitosan-alginate (1:1) films (CA). Pure chitosan films (C) were also prepared as a reference. The produced films were characterized by thickness measurements, the visual aspect and morphology, water absorption capacity (WAC), water vapor permeability (WVP), and chemical structure analysis. Macroscopically, all films were homogeneous, transparent, and easy to handle. Compared to C films, CA films showed larger apparent surface roughness, perceptible to the touch, higher thickness (71 %), and higher WVP values (1667 %). The chitosan films were completely soluble in water. However, the combination with alginate prevented dissolution and CA films showed greater stability in the presence of water, presenting only moderate swelling. The improvements observed in the properties of CA films indicate that the combination of these compounds is promising since some limitations of films containing only chitosan can be overcome.

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