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Cecilia Rojas de Gante

Tecnologico de Monterrey, México

Development of biodegradable films based on blue corn flour with potential applications in food packaging and effects of plastizicers on mechanical, thermal, and microstructural properties of flour films

Using cereal flours as raw materials for obtaining thermoplastics do not require extractive operations, thereby making the process more sustainable. In this study, blue corn flour films were developed. Commercially-available blue corn (*Zea mays* L.) kernels were obtained from Guanajato (México). The cereal grain's total composition (excluding the pericarp) is used. The blue corn flour was obtained according to the methodology described by Rojas de Gante et al. (2010). The plasticizing effects of two different polyols (glycerol and sorbitol) on the mechanical, thermal, and microstructural properties of flour films were researched. All films were transparent, with a light blue coloration and had an average thickness of 0.199±0.027 μ m. The results showed that films plasticized with sorbitol had better mechanical properties and less affinity for water than those plasticized with glycerol. The sorbitol-plasticizer with sorbitol showed the presence of the additional band at 1745 cm-1 characteristic of the carbonyl peak, which confirms the chemical linkages between sorbitol and a polymeric matrix. The effect of the plasticizer on the glass transition temperature (*Tg*) was characterized using differential scanning calorimetry (DSC). *Tg* decreased as the plasticizer content increased. Plasticizer to maintain film integrity. The sorbitol-plasticized flour films showed a compact structure.

Biography

Cecilia Rojas de Gante has completed her PhD from UFR-Sciences-Université of Reims-Champagne-Ardenne, France and she is qualified in Biotechnology in Transgenic Organisms from University of Salamanca, Spain. She is working as Researcher at Packaging Department in Laboratorios Nacionales de Fomento Industrial and International Coordinator of RISEA-CYTED Program (Iberoamerican Network of Food Packaging Centers). She is also working as a full Professor at Biotechnology and Food Engineering Department at Tecnológico de Monterrey, México.

crd@itesm.mx

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