**Effect of molecular weight and k-carrageenan on Delonix regia galactomannan film forming solutions properties and films made thereof**

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The rheological properties of Delonix regia galactomannan (GMDR) - based film forming solutions (FFSs) were studied in this work, being evaluated the effect of the molecular weight (Mw) and addition of -carrageenan (Carr). Afterwards, films were produced by casting and the surface morphology and optical properties of the films elaborated thereof were studied. Three GMDR hydrolysates were obtained varying the enzyme dosage and hydrolysis time at three different conditions being labeled as high, medium and low Mw hydrolysates respectively (HMWH, MMWH and LMWH). The FFS were produced with a 1% (w/v) polysaccharide concentration, being studied 9 FFSs: native DRGM, HMWH, MMWH, LMWH, Carr, Native:Carr, HMWH:Carr, MMWH:Carr and LMWH:Carr (mixtures of GMDR and Carr maintained a 60:40 ratio1). The gelation and melting temperatures (Tg and Tm), storage and loss moduli and apparent viscosity (app) were obtained by rheological measurements. The Tg and Tm decrease from 22.5 ºC for Carr-based FFS to ≈10.8 ºC for mixtures FFSs and from 43.9 ºC for Carr-based FFS to ≈29.8 ºC for mixtures FFSs respectively while it was observed a higher time dependence in the gel formation. A strong gel was formed by the Carr-based FFS while gels formed with the 60:40 mixtures were weak gels where the moduli values decreased for lower Mws. app obtained with shear rates from 1 to 1000 s-1 showed a shear-thinning behavior for the native DRGM and a Newtonian behavior as the Mw was reduced. The FFS were then used to produce flexible and transparent films, with exception of Carr that results on a brittle film. The optical parameters CIEL a\* b\* were measured with a colorimeter. The films presented high values of lightness (L\*) and low values of a\* that are related to the green-yellow perception; meanwhile, the Carr film b\* parameter (related with blue-red) was higher than the other films value. Further, the films from mixtures presented also a b\* parameter higher than just the galactomannan films. The Mw did not affect these optical properties. Finally, scanning electron microscopy images from film surface showed the absence of cracks or pores and that the molecular weight reduction diminish the presence of insoluble material in the surface.

*References:*

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