

Biodegradable Cellulose-Based Materials for the Use in Food Packaging

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Abstract : Cellulose acetate (CA) is a natural biodegradable polymer. It forms transparent films by the casting technique. CA suffers from high degree of water permeability as well as the low thermal stability at high temperatures. To adjust the CA polymeric films to the manufacture of food packaging, its thermal and mechanical properties should be improved. The modification of CA by grafting it with N-Amino phenyl maleimide (N-APhM) led to the construction of hydrophobic branches throughout the polymeric matrix which reduced its wettability as compared to the parent CA. The branches built onto the polymeric chains had been characterized by UV/Vis, ¹³C-NMR and ESEM. The improvement of the thermal properties was investigated and compared to the parent CA using thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC), differential thermal analysis (DTA), contact angle and mechanical testing measurements. The results revealed that the water-uptake was reduced by increasing the graft percentage. The thermal and mechanical properties were also improved.

Keywords : cellulose acetate, food packaging, graft copolymerization, thermal properties

Conference Title : ICSPCCE 2018 : International Conference on Synthetic Polymer Chemistry and Chemical Engineering

Conference Location : London, United Kingdom

Conference Dates : April 24-25, 2018