Synthesis and Characterization of the Composite Material PVA/Chitosan/5% Sorbitol with Different Ratio of Chitosan

Abstract

Composites of Poly (vinyl alcohol) (PVA)/Chitosan (CS) have been synthesized and characterized successfully. Mechanical and degradation properties of composites also have been modified. PVA/CS composites prepared with different concentration ratio of PVA/CS (90%PVA/10%chitosan, 80%PVA/20%chitosan, 70%PVA/30%chitosan, 60%PVA/ 40%chitosan and 50%PVA/50%chitosan). FTIR shows the changed in intensity and bonding as well as shifting in peaks with increasing of CS, and sorbitol. SEM micrographs of composites surface showed that CS partially miscible with high ratio of PVA. Mechanical properties were characterized and the result indicates that tensile strength and modulus of elasticity increased with increasing CS ratio which associated with decreasing in elongation and flexibility of films. By adding sorbitol, the elongation at break has been improved. Weathering of composites showed high degradation rate with higher CS concentration. Degradation of composites has been affected by the addition of sorbitol. A numerical study was conducted for the PVA/CS, the study gives a closed results compared with the experimental values.

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