

FUNCTIONILISATION OF POLY(ETHYLENE-CO-VINYL ALCOHOL)

Liesl Keulder¹, Prof. A.J. van Reenen¹

¹Department of Chemistry and Polymer Science, University of Stellenbosch, Private Bag X1,
Matieland, 7602, SouthAfrica

ABSTRACT

Poly(ethylene-co-vinyl alcohol) is a polymer with excellent barrier properties and good blood compatibility. With all these properties it is a polymer that can be used in various applications. Poly(ethylene-co-vinyl alcohol) contains hydroxyl groups, which make the functionilisation of this polymer quite easy. Reacting this polymer with other monomers or polymers gives us the opportunity to form new materials. Recently studies have been done by making poly(ethylene-co-vinyl alcohol) membranes and reacting them with monomers to form a polymer with carboxylic groups^{1,2}. Poly(ethylene-co-vinyl alcohol) is also a polymer that can be electrospun very easily, because it dissolves at intermediate temperatures and can produce fibres with diameters in the nanometer range. Previously we found that we could combine these fibres with polyolefins, enhancing the properties of the polymers.

In this study we report the functionalisation of poly(ethylene co-vinyl alcohol) with maleic anhydride and the reaction with poly(styrene-co-maleic anhydride). We characterized these polymers fully by using NMR, ATR and SEM. These polymers were also electrospun and the resultant fibres were fully characterized. We also added multiwalled carbon nanotubes to the poly(ethylene-co-vinyl alcohol) fibres and these were then added to polyolefins like low density polyethylene to produce nanocomposite materials. The mechanical properties of the nanocomposite materials were compared to composites without fibres or multiwalled carbon nanotubes. The results of these studies will be presented in the poster.

References:

- (1) Ruiz, C.; Sánchez-Chavez, M.; Cerrada, M. L.; Fernández-García, M. *Journal of Polymer Science: Part A: Polymer Chemistry* 2008, 46, 7238-7248
- (2) Sánchez-Chavez, M.; Ruiz, C.; Cerrada, M. L.; Fernández-García, M. *Polymer* 2008, 49, 2801-2807