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GRAFTING OF PCL TO EVA BY REACTIVE PROCESSING: EFFECT OF PCL MOLAR MASS

Moura[a,*], A.V. Machado[a], R. Nogueira[b], V. Bounor-Legare[c]

a Instituto de Polímeros e Compósitos/I3N, University of Minho, Campus de Azurém, 4800-058 Guimarães, Portugal, bCentro de Engenharia Biológica, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal and cUniversité de Lyon, Lyon, F-69003, France, Université de Lyon 1, Lyon, F-69003, France, CNRS UMR5223, Ingénierie des Matériaux Polymères : Laboratoire des Matériaux Polymères et Biomatériaux, F-69622 Villeurbanne, France

**Corresponding author: isabelm@dep.uminho.pt*

In recent years, much concern has increased on deterioration of our environment due to solid waste pollution. To solve this problem, attempts are made to replace synthetic polymers by biodegradable ones. Unfortunately the relatively high price of biodegradable polymers and processing difficulties delay their application. Alternatives to biodegradable polymers are biobased polymers, which can be prepared by blending or copolymer formation of a biodegradable and a synthetic polymer. Thus, the present work aims to investigate the influence of the molar mass of poly(ε-caprolactone (PCL) on EVA-g-PCL copolymers formation by transesterification reactions between ethyl vinyl acetate (EVA) and PCL, using titanium propoxide ($Ti(OPr)_4$) as initiator .
The materials were prepared in a internal batch mixer and characterized by SEM, FTIR, rheology, DSC, TGA, XRD, selective extraction of the formed copolymers and tensile properties.
Morphological results by SEM evidence copolymer formation, the particle size of the dispersed phase decreases as the PCL molar mass increases. For PCL with higher molar mass only one phase is detected.
The tensile properties of the prepared materials are similar to the ones of synthetic polymers. The biodegradability, evaluated based on biochemical oxygen demand method, showed that biodegradability depends on the amount of copolymer formed and its structure.