

STUDY OF HYDROTHERMAL AGEING OF POLY(VINYLCHLORIDE)/OLIVE POMACE COMPOSITE

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Abstract

Every year, during the season of transformation of olive to oil, thousands tons of olive residue are rejected to nature or incinerated causing environmental pollution. The recovery of this renewable waste like a filler in the composite domain may have a double positives impact, economic, and ecological.

However, the primary disadvantages are (a) poor interfacial adhesion and dispersion in olefin thermoplastic matrix materials due to hydrophilic character of cellulose, (b) high moisture absorption leading to dimensional instability, and (c) low permissible temperatures of processing and use due to their limited thermal stability. The hydrophilic groups present in unmodified cellulose are detrimental to the performance of the cellulose based composites if the fibers are exposed to the outside atmosphere. Water, in liquid or vapour form, can diffuse into the composite, and the properties are hampered due to hydratation.

During the past two decades, several methods have been reported in the literature for improvement of the adhesion between the filler and thermoplastic matrices.

The great part of the publications dealt on the use of cellulosic fibers treatment with chemical agents and the characterization of the properties performances of such composites, however very few publications are devoted to ageing of this class of materials.

This study is aimed to improve the interface between the matrix and the lignocellulosic PVC by chemical filler treatments with silane and PVC-g-MA and to testing the performance of these composites in the hydrothermal ageing.

The comparison of the results of characterization of the neat PVC, composite filled with the untreated olive pomace and the treated ones showed a reduction of water absorption after the chemical treatment, thus improving the mechanical properties.