

THERMAL AND MECHANICAL PROPERTIES OF POLYOLEFINS/WAX PCM BLENDS PREPARED WITH AND WITHOUT EXPANDED GRAPHITE

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ABSTRACT

The study deals with the preparation of polyolefin/wax blends as form-stable, solid-liquid phase change material (PCM) for thermal energy storage, and with the determination of their thermal properties. In such a composite, the wax serves as a latent heat storage material and the polyolefins (EVA and PP) act as supporting materials, preventing leakage of the molten wax and providing structural strength. To improve the thermal conductivity of these blends, expanded graphite loadings of 3, 6 and 9 wt% was added into the samples, whereas the polymer/wax were kept at a 1:1 ratio. Both the blends and composites were subjected to different characterization techniques in order to establish their morphology, as well as thermal and mechanical properties. The techniques used were scanning electron microscopy (SEM); differential scanning calorimetry (DSC); thermogravimetric analysis (TGA); thermal conductivity; dynamic mechanical analysis (DMA); X-ray diffraction (XRD); tensile testing; impact testing. In this presentation the results will be shown and discussed.