

EFFECT OF CHEMICALLY MODIFIED SILICA ON THE PROPERTIES AND DEGRADATION BEHAVIOR OF POLYCARBONATE (PC) AND POLY (METHYL METHACRYLATE) (PMMA)

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ABSTRACT

This work reports on the introduction of chemically modified silica nanoparticles into PMMA and PC matrices through melt compounding. The XRD, AFM and TEM results showed that nanoparticles in the transparent nanocomposites of PMMA are well distributed with few agglomerates. Storage modulus of the composites is almost the same as that of the pure PMMA below the glass transition, and it is slightly higher above T_g . There is an apparent shift in the β -relaxation peak to higher temperatures with an increase in the silica content. This suggests that the presence of SiO_2 decreases the free volume and form a compact structure which will restrict long polymer chain segments to move. When the chain mobility is restricted, more energy will be needed to activate movement. The thermal degradation behaviour of the composites, as well as results the PC nanocomposites will also be presented.