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# AN INVESTIGATION ON INTERACTIONS OF NANOCLAY LAYERS AND POLYMERIC CHAINS USING DMTA AND SEM

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Poly vinyl chloride (PVC)/ Acrylonitrile butadiene rubber (NBR)/ organoclay nanocomposites have been prepared via direct melt mixing in an internal mixer with various nanoclay contents. The interactions between polymer chains in matrix and nanoclay layers were investigated by dynamical mechanical analysis (DMA) and verified using fractography test with scanning electron microscopy (SEM). DMA analysis showed that nanocomposites present single Tg (peak of tan? at 1 Hz) around 60?C to 80?C at any concentration of nanoclay. One-peak tan? vs. temperature observed for all samples was due to the miscible nature of nanocomposites. By increasing nanoclay content the Tg of nanocomposites occurred in higher temperatures. This could be due to the higher movement restrictions caused by nanoclay layers. The storage modulus (E?) varied as a function of nanoclay as well. At temperatures lower than Tg, storage modulus did not show any significant difference by nanoclay introduction. Above Tg temperature, the nanocomposites with higher nanoclay loading, presented higher storage modulus. SEM photographs supported the results obtained from DMA. The graphs indicated that the interactions between nanoclay layers and polymer chains increased by loading less than 7 wt.% of nanoclay. Appling higher nanoclay concentration resulted on agglomeration of nanoclay layers that caused in separation of nanoclay layers and polymer matrix.