

Comparison of the mechanical and tribological properties at similar hardness level of HNBR filled with CNT nanofillers

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Nanoscale fillers provide the promise of creating new materials with enhanced performance. Carbon nanotubes (CNTs) are considered to be the most promising candidates to reinforce rubber mechanically as compared with conventional filler due to their outstanding mechanical properties and excellent electrical and thermal conductivity. In this study, commercially available CNTs (Nanocyl NC 7000TM) are used as reinforcing fillers with carbon black and silica. A hydrogenated nitrile butadiene rubber (HNBR) was used as rubber matrix for the composites. Rubber product is required specific hardness in practical application. Therefore, all nanocomposites having the similar hardness level were prepared by adjusting the amount of filler. Single filler (Carbon black or silica) filled HNBR nanocomposites were partially replaced by CNTs and their mechanical and tribological properties were compared. 100% modulus and elongation of the nanocomposite were measured by universal testing machine (UTM). The coefficient of friction (COF) and wear behavior of the HNBR nanocomposite were investigated by tribo-tester.