

TITLE REINFORCEMENT OF MULTIWALLED CARBON NANOTUBE IN NITRILE RUBBER: IN COMPARISON WITH CARBON BLACK, CONDUCTIVE CARBON BLACK, AND PRECIPITATED SILICA

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ABSTRACT The properties of nitrile Rubber (NBR) reinforced by multiwalled carbon nanotube (MWCNT), conductive Carbon black (CCB), Carbon black (CB), and precipitated Silica (PSi) were investigated via viscoelastic behavior, bound Rubber content, electrical properties, cross-link Density, and Mechanical properties. The filler content was varied from 0 to 15 phr. MWCNT shows the greatest magnitude of Reinforcement considered in terms of Tensile strength, modulus, hardness, and abrasion resistance followed by CCB, CB, and PSi. The MWCNT filled system also exhibits extremely high levels of filler network and trapped Rubber even at relatively low loading (5 phr) leading to high electrical properties and poor dynamic Mechanical properties. Although CCB possesses the highest specific surface area, it gives lower level of filler network than MWCNT and also gives the highest Elongation at break among all Fillers. Both CB and PSi show comparable degree of Reinforcement which is considerably lower than CCB and MWCNT.