

Effects of carbon black amount and type on mechanical and viscoelastic properties of Carbon black-Filled Natural Rubber Compounds

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Carbon black-filled natural rubber (NR) compounds were prepared using various types of carbon black. 3 types of carbon black (FEF, SRF and MT) with different structure and contents were used. For tensile testing, the compounds with different content of carbon black were vulcanized in a hydraulic press at 160°C. Mechanical properties, such as hardness and tensile properties etc., of compounds were investigated. Loss tangent and dynamic-static ratio were also observed by using DMA. The experimental results indicated that, as the structure of the carbon black increased, all the mechanical properties increased. But different effects were obtained when the amount of fillers was increased. It was also observed at the viscoelastic test. It was found that the different structures and contents of carbon black affected these properties. And these results are attributed to physical and chemical interactions between carbon black structures and rubber molecules.