Processability characteristic of natural rubber hybrid composites: carbon black-silica filler system

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Abstrak

Silica combine with carbon black was successfully applied in natural rubber hybrid composites. The processability of those composites were evaluated through assessment of Mooney viscocity, time to scorch, cure characteristic, reversion tendency and viscous to elastic (V/E) ratio. Types of silica employes in this research were local silica and Zeosil. Silica loading was 0, 5, 10, 15, and 20 phr, and carbon black was set to be fixed. SEM study was conducted to scan the morphology of both silica. The processability parameters had been evaluated using Mooney viscometer and Moving Die Rheometer (MDR). The MDR experiments were carried out in three different temperatures, i. e. 130, 150, and 170ºC. Local silica particles showed smaller size but with agglomeration. Introduction silica markedly increased the Mooney viscocity and minimum torque (ML). Types of silica affect the time to scorch, optimum cure time and maximum cure rate, and V/E ratio. All rubber samples showed reversion tendency at high temperature.