

Utilization of Paddy Husk Carbon Black as an Alternative Filler Material in Rubber Industry

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Abstract:

Paddy husk (rice husk) is an abundant agricultural waste product in Sri Lanka. The utilization of paddy husk has drawn widespread attention worldwide. In this study, the main focus is to produce carbon black from the paddy husk waste. The ability to use Paddy Husk Carbon Black (PHCB) as a substitute raw material for conventional carbon black has been investigated during the study by analyzing the physical and mechanical properties of the selected rubber compound. Based on the particle size of the ball-milled PHCB powder, tyre inner liner compound was selected, and the compound formula was prepared for seven different ratios of PHCB and existing industrial carbon black type (N330). The rheological properties, tensile properties, tear resistance, bonding strength and age analysis were performed in order to find the best PHCB composition with the optimum properties. The sample containing 40% of PHCB and 60% N330 carbon black amount showed the optimum properties which satisfied the available industry specification limits and the properties of the reference sample. Hence, this is an effective way to reduce the filler cost of the rubber compound as well as it provides a sustainable solution for paddy husk waste management.

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Author Keywords

paddy husk carbon black, waste management, rubber compounding, tire inner liner, pyrolysis

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