

The influence of cure characteristics and crosslink density of virgin acrylonitrile butadiene rubber/recycled acrylonitrile butadiene rubber (vNBR/rNBR) blends

Abstract

Cure characteristics and crosslink density of virgin acrylonitrile butadiene rubber/recycled acrylonitrile butadiene rubber (vNBR/rNBR) blends were studied. Three different size ranges of rNBR particles, i.e., 150 - 350 μm , 2.0-15.0 mm, and 5-10 cm were used in this study. The vNBR/rNBR blends with blend ratios of 95/5, 85/15, 75/25, 65/35, and 50/50 were prepared using a two roll-mill at room temperature. The characterization results of the blends show that scorch time, t_2 , of the vNBR/rNBR blends decreased with increased rNBR content as well as decreasing sizes of rNBR particles while cure time, t_{90} of the vNBR/rNBR blends increase with increased rNBR content as well as increasing sizes of rNBR particles. Among all blend ratios, the vNBR/rNBR blends with smallest size of rNBR particles exhibit lowest minimum torque (ML) compared with the bigger particle sizes of it in vNBR/rNBR blends which resulted in more efficient processing. The maximum torque (MH) of all vNBR/rNBR blends shows the inclining trend with increased rNBR. The cross-linking density of vNBR/rNBR blends also show an increasing trend with increasing rNBR content.

Keywords; Crosslink Density, Curing Characteristic, rNBR, vNBR