

A Study of FTIR, Thermal Properties and Natural Weathering Test on NBR Virgin/Recycled with SBR Blends

Abstract

The effects of styrene butadiene rubber/virgin acrylonitrile butadiene rubber (SBR/NBR_v) blends and styrene butadiene rubber/recycled acrylonitrile butadiene rubber (SBR/NBR_r) blends on properties such Fourier transform infrared (FTIR), thermal gravimetric analysis (TGA) and differential scanning calorimetry (DSC) were carried out. Results indicated that, based on intensity of amine peak from FTIR at 85/15 blend ratio (R15) revealed optimum formation of crosslink between SBR and NBR either using virgin or NBR_r. TG thermograms of SBR/NBR_v blends of all ratios showed better onset thermal stability than SBR/NBR_r blends. The change in the horizontal baseline from high to low energy level occurred in virgin NBR blends because the amount of reactive sites available in virgin NBR is higher compared to NBR_r. Meanwhile NBR_r blends showed T_c because the amount of crosslink occurred in these blends were slightly lower than NBR_v blends. Up to 25 phr of NBR_r, the tensile strength and elongation at break (E_b) retention of SBR/NBR_v blends was better than SBR/NBR_r blends after 6 months' weathering test except for M100. The scanning electron microscopy on the surface of both blends after 6 months exposure indicated that the severity of the crack was minimal for SBR/NBR_r blends compared to SBR/NBR_v particularly at 50/50 blend ratio designated the SBR/NBR_r blends that contained more NBR_r particles could reduce the degradation towards natural weathering.