

# **The effects of trans-polyoctylene rubber on thermal analysis and fatigue properties of styrene butadiene rubber/recycled acrylonitrile butadiene rubber.**

## **Abstract**

The incorporation of trans-polyoctylene rubber (TOR) into the blends of styrene butadiene rubber/recycled acrylonitrile butadiene rubber (SBR/NBRr) was investigated. The thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC), and fatigue life of SBR/NBRr blends with and without TOR were studied. Results showed that SBR/NBRr blends with TOR exhibited better thermal stability than SBR/NBRr blends without TOR. A DSC result showed that with incorporation of TOR into the SBR/NBRr blends, it alters the calorimetric profile particularly for SBR/NBRr/TOR (R05/TOR), which shows changes in the horizontal line from a high to low energy level along with a greater  $\Delta H$  value. The fatigue life of SBR/NBRr blends with the incorporation of TOR showed higher values than SBR/NBRr blends without TOR, particularly at 75/25, 65/35, and 50/50 blend ratios. The scanning electron microscopy images of SBR/NBRr blends with TOR illustrated that the failure surface became rougher with many tear lines compared to SBR/NBRr without TOR, indicating that a good interaction occurred between the NBRr and SBR matrix with the presence of TOR.