

Styrene Butadiene Rubber/Halloysite Nanotubes Nanocomposites

Rohit Patle¹, Abrar Ahamad², Vishal Verma³, K.N. Pandey⁴ and R.M. Mishra⁵

^{1,2,3,4,5}Central Institute Of Plastics Engineering and Technology Lucknow-226008 India
E-mail: ¹rohitpatle@gmail.com

Abstract—Nanocomposites comprising of styrene butadiene rubber (SBR) and halloysite nanotubes (HNT's) have been prepared by melt mixing process using two roll mill. The morphological behaviour of developed nanocomposites have been studied by scanning electron microscopy (SEM) which demonstrate that there is excellent dispersion of HNT's in SBR matrix at nano-scale. The thermal stability of SBR/HNT's nanocomposites has been conducted by thermo-gravimetric analyzer (TGA). The thermal stability of nanocomposites has been found to be remarkably enhanced by incorporation of HNT's in rubber matrix. Mechanical property results of the nanocomposites reveal that there is fairly good enhancement in tensile strength and elongation at break as the content of HNT's is increased. It is also worth seeing from the mechanical property results that at 3 phr loading of HNT's in rubber matrix provides the highest mechanical properties. The increase in mechanical properties may be attributed to the higher aspect ratio and higher surface area of HNT's. Reinforcing effect may be because of better dispersion and orientation at nanometre scale of HNT's in SBR matrix.

Keywords: SBR, HNT's, SEM, TGA, tensile strength, Elongation at break.