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ELASTOMERS BASED ON NR/BR/SBR TERNARY RUBBER BLEND: MORPHOLOGICAL, MECHANICAL AND THERMAL PROPERTIES

Article Highlights

- The influence of amount SBR rubber in NR/BR/SBR rubber blends was investigated
- The amount of the CB in NR/BR/SBR rubber blend is 60 phr
- The NR/BR mass ratio in ternary nano-blends is 1:1
- The optimum content of SBR rubber in NR/BR/SBR rubber blend is 40 phr

Abstract

The elastomeric materials based on NR/BR/SBR ternary rubber blend were investigated. The polyisoprene (NR), butadiene (BR) and styrene butadiene (SBR) rubbers were used as network precursors and carbon black (CB) as an active filler (60 phr) for elastomeric materials preparation. For sample preparation, the mass ratio of NR to BR was constant, 1:1, but the SBR content was varied from 0 to 80 phr. The morphological, mechanical and thermal properties of prepared elastomeric materials were determined using scanning electron microscopy (SEM), mechanical tensile measurements and thermogravimetric analysis (TGA). Mechanical properties were assessed before and after thermo-oxidative aging during 168 h at 100 °C. The values of tensile strength, elongation at break, and hardness decrease up to 40 phr of SBR content and after that are increasing, but abrasion resistance of ternary rubber blends increases. The thermal decomposition temperature obviously shifted to a higher temperature for the sample with 40 phr of SBR.

Keywords: carbon black, mechanical properties, ternary rubber blends, thermo-oxidative aging, thermal properties.

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