AKRON RUBBER DEVELOPMENT LABORATORY, INC.

The Effects of Dynamic Vulcanization on the Morphology and Rheology of TPV's and their Nanocomposites

Abstract

Thermoplastic vulcanizates (TPV's) have been extensively studied over the past decade due to the promise they show as high performance elastomers. Hence we specifically address the effects of dynamic vulcanization on the morphology, rheology and processing of these materials. Controlled variations were made to the composition and mixing of TPV's formed by dynamic vulcanization of EPDM rubber, with polypropylene as the continuous phase, in order to significantly affect their rubber phase morphology, rheology and properties.

The effects of nanoscale layered silicate reinforcement of the rubber phase on the above structure and performance parameters, as well as on the EPDM cure characteristics, were also addressed. Characterization of the TPV's and their nanocomposites was done using atomic force microscopy (AFM) and rheology.

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