P-3-464

THE EFFECTS OF MOONEY VISCOSITY AND MELT ELASTICITY UPON MICROSTRUCTURE AND DYNAMO- MECHANICAL PROPERTIES OF EPDM-G-MA COMPATIBILIZED NATURAL RUBBER/ORGANOCLAY NANOCOMPOSITES

Parisa Khoshnoud[a], Ali Asghar Katbab[a,*], Nima Mostofi [a]

[a] *Department of Polymer Engineering and Color Technology, Amirkabir University of Technology, No. 424, Hafez Ave, Tehran-Iran,*

**Corresponding author: katbab@aut.ac.ir*

Nanocomposites based on NR/Organoclay and maleated EPDM rubber as compatibilizer were prepared successfully via melt mixing process in an internal mixer. Effect of the NR Mooney viscosity and melt elasticity of NR upon the developed microstructures and mechano-dynamic properties of nanocomposites have been investigated. Cure characteristics were determined by a Monsanto ODR2000 rheometer, whereas XRD and linear melt viscoelastic characterization were carried out to examine the extent of intercalation and polymer/clay interfacial intercalation. These were verified by performing mechano-dynamic tests such as tensile, abrasion, fatigue and hardness.

The obtained results showed pronounced enhancement of melt strength and tensile properties of the interfacially compatibilized nanocomposite vulcanizates. However, more enhancements of these properties were observed for these the samples based on lower Mooney viscosity NR as matrix, indicating the effectiveness of mastication in enhancing NR/organoclay intercalation process. This was consistent with higher fatigue resistance exhibited by the nanocomposite generates by the lower Mooney viscosity NR. The results revealed higher clay dispersion and more number of interfaces formed between NR segments and clay platelets, leading to higher damping sites which results in higher fatigue life of the nanocomposites compared to the unfilled NR vulcanizates. Moreover, melt elasticity showed to play as the key parameter in controlling the interdiffusion of NR chains on to the clay galleries even for the low Mooney NR matrixes.