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THE ROLE OF NANOCLAY DISTRIBUTION IN MICROMORPHOLOGY DEVELOPMENT AND PROPERTIES OF PP/EPDM THERMOPLASTIC OLEFINE (TPO), AND THERMOPLASTIC VULCANIZATE (TPV)

P.Katbab[a,*], A.A.Katbab [b], Ali Haghighat [b]

[a] *Chemical Engineering Faculty , University of Tehran, Tehran, Iran and* [b] *Polymer Enginerring Department, Amirkabir University of Technology, Tehran, Iran*

**Corresponding author: pkatbab@ut.ac.ir*

Rubber modified thermoplastic nanocomposite comprising nanoscale layered silicates derived from an organomodified clay in a PP/EPDM (70/30, W %) simple blend named TPO and a thermoplastic vulcanizate (TPV) were prepared via direct and masterbatch melt blending process. Influences of interfacial interaction between the phases as well as nanoclay distribution upon the micromorphology melt rheology, mechanical and oxygen barrier properties have been investigated and compared to the two groups nanocomposites. AFM and SEM analysis revealed isolated EPDM droplets with the size nearly 0.6-2.0 ?m dispersed throughout the PP matrix in the structure of TPO nanocomposites, indicating prevention of rubber droplets coalescence by the clay platelets. Whereas, TPV nanocomposites showed aggregated structure for EPDM droplets. High melt viscosity and enhanced melt elasticity exhibited by the TPV/Organoclay nanocomposites, and TPO based nanocomposites presented less oxygen barrier properties rather than TPV nanocomposite counterparts. This was consistent with lower restricted dynamic motions for the PP segments in the structure of NTPO samples as was evidenced by DMA analysis. Keywords: PP/EPDM, nanocomposite, barrier properties, nanoclay, melt blending process.