

Effect of comonomer feed ratio on structure and rheological property of copolymer/Na-MMT Nanocomposites via Emulsion polymerization

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Exfoliated poly(styrene-co-methyl methacrylate)/clay nanocomposites was synthesized through an emulsion polymerization. Silicate layers affect the composition of comonomers inside silicate layers due to different interaction between clay layers and monomers with different polarities. Controlling the comonomer feed ratio, we obtained both exfoliated and intercalated structure of poly(styrene-co-methyl methacrylate)/clay nanocomposites. As the portion of polar MMA increase the nanocomposite goes to exfoliated structure due to the better compatibility with clay surface. Contrarily as the portion of non-polar styrene increase the nanocomposite goes to intercalated structure due to weak interaction with clay surface. As the portion of styrene increase the nanocomposite showed larger storage modulus and viscosity than those with more portion of MMA due to physical interaction of stiff clay layer and stiff benzene ring of styrene although base resin with more portion of styrene presented lower values than those with more portion of MMA.