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PS/PA6/PS-G-PA6 AND MONTMORILLONITE CLAY NANOCOMPOSITES: MORPHOLOGY AND RHEOLOGICAL PROPERTIES

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The nanotechnology is one of the most promising sectors of the scientific and technology evolution of the XXI century. In the development materials engineering, the study of the process and preparation of polymeric nanocomposites emerge fast like multidisciplinary research activity which results can prolong the polymers application field. Among the most used clays actually, the montmorillonite type has a layer structure, maintained piled up by relatively weak forces, which makes possible its employment in the polymer-clay nanocomposites preparation. Improvement of the elastic modulus, better mechanical resistance, and better processing control are some of improved characteristics obtained in previous work. The project considered here aimed at studying the morphology and rheological properties of the polystyrene (PS)/polyamide 6 (PA6) blends and its nanocomposites with montmorillonite clays. Graft copolymers with PS as backbone and PA6 as grafts (PS-g-PA6), were used as compatibilizers. It was intended to evaluate the morphology and rheological properties of obtained systems. Techniques of Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM) and a controlled-strain rheometer ARES were used. The interfacial tension was estimated using three comparative theoretical methods: Taylor, Palierne and Gramespacher methods. The results indicated that the nanoclays act as a plastifier in this blends, and copolymers having larger PA6 grafts have better effect of compatibilization; the greater the interaction PA6/nanoclays, stronger the interfacial tension.