

Synthesis of PVC – MMT Nanocomposites via in situ Miniemulsion Polymerization

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PVC–MMT nanocomposites were synthesized by encapsulating MMT via miniemulsion polymerization. The miniemulsification was carried out by using Ultraturrax homogenizer. The average particle size (APS) and particle size distribution (PSD) of PVC latexes ultimately depend on the agitation intensity and in miniemulsification process and concentration of emulsifier. The APS of latexes were in order of 0.4–0.7 μ m and the PSD of latexes were in order of 0.8–1.5. The stability of PVC nanocomposites latexes were very good at low filler loading. The maximum MMT could be encapsulated was 4 wt%. The XRD patterns and TEM images showed that the almost all MMT were exfoliated dispersion in PVC matrix. The glass transition temperature of PVC–MMT nanocomposites increased with the MMT loading. At low temperature (less than 300°C), the thermal stability of PVC–MMT nanocomposite was lower than that of pristine PVC. The onset decomposition temperature T_{onset} of PVC–MMT nanocomposites decreased with increasing of MMT loading. However, at high temperature, the thermal stability of PVC–MMT nanocomposites were much higher than that of pristine PVC.