偏二氯乙烯-丙烯酸甲酯共聚體/黏土奈米複材的合成及其特性之研究

英文摘要

Poly (vinylidene chloride-co-methyl acrylate, VDC-MA copolymer)/ clay nanocomposites were prepared by in-situ emulsion polymerization with a fluorinated synthetic mica (MEE). Below 5 wt% MEE, it was found that apparent exfoliated structures were present in the VDC-MA copolymer/MEE nanocomposites. In nitrogen or air stream, VDC-MA copolymer/MEE nanocomposites exhibited a multi-steps thermal degradation behavior, and theses degradation mechanism were significantly related to the morphology of nanocomposites and VDC content. In nitrogen, the initial crosslinking temperature of VDC-MA copolymer/MEE nanocomposites decreased with VDC and MEE contents, higher char yield of the resulting nanocomposities were obtained. In air, the thermal oxidation reaction temperature of VDC-MA copolymer/MEE nanocomposites increased as the amount of MEE increased, and its thermal stability was hence improved. The melting point (Tm) of crystalline nanocomposities decreased with MEE contents, the crystallization and the melting behavior were significantly related to the morphologies of nanocomposites and VDC content, whereas the glass temperature (Tg) of nanocomposites was independence of the morphology of nanocomposities. At low temperature, VDC-MA copolymer/MEE nanocomposities showed a higher storage modulus and it increased irregularly with VDC and MEE contents. Water vapor/oxygen barrier properties were significantly improved in VDC-MA copolymer/MEE nanocomposites.