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Effect of clay modification and preparation method on crystallization behavior, thermal stability and flammability of isotactic polypropylene/organoclay nanocompositesM M Enezi, L A Al Juhaiman and W K Mekhamer
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In the present study, isotactic polypropylene (PP)/local organoclay (OC) nanocomposites were prepared by two different methods, namely extrusion and casting method. Cationic surfactant, Hexadecylpyridiniumchloride(CPC) is used to modify the Khulays clay from Saudi Arabia after saturating its surface with Na⁺ ions. The crystalline structure and properties of OC and PP /OC were investigated by FTIR, XRD, DSC, TEM, SEM to establish the correlation between the preparation method and the degree of clay intercalation/exfoliation in PP matrix. Using simple combustion apparatus, the effect of organoclay content on the flammability behavior of the PP/organoclay was investigated by horizontal burning tests for HB classification, Underwriters Laboratories (UL94). The above investigations reveal that PP/OC nanocomposites prepared by extrusion have the most extensive dispersion of OC particles and high levels of exfoliation compared to that prepared by casting method. The vertical burning tests results showed increase in the ignition time and significant reduction of flame propagation rate of PP/organoclay nanocomposites compared to neat PP

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