

THE EFFECT OF MULTI-STAGE SEQUENTIAL POLYMERIZATION PROCESS ON RHEOLOGICAL BEHAVIOUR AND INTERFACE OF PP/EPR IN-REACTOR ALLOYS

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The rheological behavior, morphology, mechanical properties, thermal properties and molecular structure of in-reactor alloy of Polypropylene (PP)/Ethylene Propylene Rubber (EPR) synthesized by multi-stage sequential polymerization were investigated. The alloys were characterized by RMS, SEM, mechanical testing, DSC, NMR and GPC. The electron microscopy of samples showed that as the switch frequency increased, the size of dispersed phase decreased. The small amplitude oscillation rheometry showed that storage modulus and viscosity shifted to higher values when switch frequency increased. NMR results were used for the evaluation of compatibility between the two phases, when switch frequency is changed. DSC results showed that T_m and T_c were almost independent of switch frequency but crystal content in the alloy was be high and ΔH increased about 13% when the size of dispersed phase decreased. It was found from the GPC results that switch frequency affected slightly on the molecular weight distribution of copolymer but it had no effect on homopolymer .