

عنوان مقاله:

Application of Composite Theories for Modeling Tensile Modulus of PP/Nanoclay/CaCO₃ Hybrid Nanocomposite

محل انتشار:

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خلاصه مقاله:

PP/nanoclay/CaCO₃ ternary nanocomposite was prepared using melt compounding in a lab-scale co-rotating twin screw extruder. The tensile modulus of prepared samples was measured experimentally. The composite theories including: Rule of mixtures, Inverse rule of mixtures, Modified rule of mixtures (MROM), Paul, Counto, Guth and Halpin-Tsai were applied to analyze the tensile modulus of the PP/nanoclay/CaCO₃ hybrid ternary nanocomposite. The empirically measured data were compared with the theoretical tensile modulus in order to determine the best models and subsequently develop and optimize methods to predict the mechanical behavior of nanocomposites. Rule of mixtures model provided the upper values of the tensile modulus while the MROM under-predicted most data. Also, at low aspect ratio of nanoclay layers, Halpin-Tsai model was able to predict fairly well the tensile modulus

کلمات کلیدی:

PP/nanoclay/CaCO₃ ternary nanocomposite, Composite theories, Tensile modulus

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