

Mechanical Properties of Poly(carbonate)/Vapor-Grown Carbon Fiber Composites Prepared by Melt Compounding

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We discuss the effect of Polycarbonate (PC) type and Vapor-Grown Carbon Fiber (VGCF) size on the mechanical properties of PC/VGCF composites prepared by melt compounding using a twin-screw extruder. Several kinds of PC which have different melt volume flow rate, and two kinds of VGCF which have different aspect ratio (VGCF-S which is the aspect ratio of 100, and VGCF-H which is the aspect ratio of 40.) were used in this study. In addition, the VGCF contents were set up at 0, 1, 2, 4 and 7 wt% in each PC/VGCF composites. The Young's modulus of PC/VGCF composite increased with VGCF content in each case. These tendencies would be almost independent of VGCF aspect ratio and melt viscosity of PC matrix. Tensile strength, which is maximum stress during tensile testing, of PC/VGCF composite increase with VGCF content at low melt viscosity of PC matrix. On the contrary, tensile strength of PC/VGCF composites decreased with an increase of VGCF content at high melt viscosity of PC matrix. It is implied that the tensile strength of PC/VGCF composite may depend on the VGCF dispersion state in PC/VGCF composite.