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Toughening of Polypropylene with Calcium Carbonate Particles

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Polypropylene is modified with calcium carbonate particles. The PP had a MFI of 2.4. The calcium carbonate is a precipitated type with a particle size of 0.7 µm and with a 1% stearic acid coating. The calcium carbonate content was varied from 0 -35 vol %.
Studied were the morphology of the composites, the modulus and yield strength and the notched Izod impact strength as function of temperature. The results were compared to a PP-EPDM blend. With increasing with calcium carbonate content, the modulus increased, the yield strength decreased, the Izod impact strength increased and the brittle-to ductile transition was shifted to lower temperatures. A model is given for the deformation behavior of a filled system.