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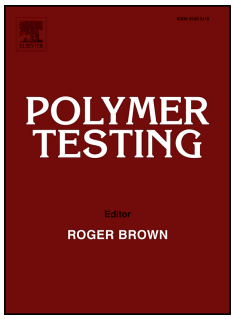

Analysis of the processing-pressure dependent refractive index of Poly(methyl methacrylate) by transmission measurements of glass-filled specimen

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Test Method

Analysis of the Processing-Pressure Dependent Refractive Index of Poly(methyl methacrylate) by Transmission Measurements of Glass-filled Specimen

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Abstract

The influence of pressure during solidification on the refractive index of poly(methyl methacrylate) (PMMA) was analyzed by transmission measurements on injection molded glass-filled specimens with a standard spectrometer. The refractive index was evaluated using the wavelength of the maximum transmittance of the specimens, which indicates an intersection of the refractive indices of PMMA and glass. The method makes it possible to measure the average refractive index over the component cross-section without further sample preparation. The measurements show that the RI varies significantly between injection-molded samples produced with different pressures and between different positions on a sample. Summarized over all measurements, the refractive index of PMMA increases by 0.0022/1000bar with the pressure in the injection molding process during the solidification of the material.

Keywords: Refractive Index; Transmission; Glass filler; Transparent Polymer; Transmittance;