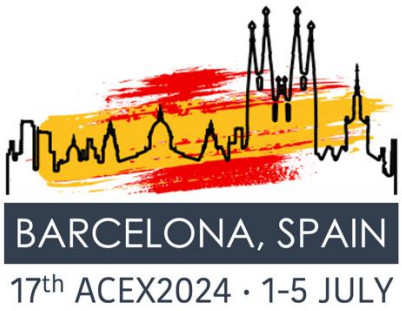

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ABSTRACT:

In Situ Analysis of the Curing Processes via Temperature Modulated Optical Refractometry

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The rather new method of “Temperature Modulated Optical Refractometry” (TMOR) has been developed to investigate optical and thermo-mechanical properties of polymers in the course of curing under isothermal and temperature-rated controlled conditions. Here, it will be demonstrated that the refractive index, as determined by TMOR, can at least partially substitute infrared studies with regard to the degree of cure. In addition, when the curing process is driven by a temperature rate, the influence of curing can be separated from that of thermal expansion. Only recently, TMOR has been further developed to monitor the curing process during UV-initiated polymerization. The central problem of decoupling the optical TMOR detection from the UV signal irradiated onto the sample was solved. The compatibility between the T-modulation time and the polymerization rate was realized by pulsing the UV signal.