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Surface Orientation in Injection-Molded Thermotropic Liquid Crystalline Copolyester (TLCP) Plaques[1] ROBERT BUBECK, Michigan Molecular Institute, JUN FANG, WESLEY BURGHARDT, Northwestern University, SUSAN BURGARD, KATHERINE ROBERTSON, Impact Analytical, DANIEL FISCHER, NIST — Attenuated total reflection Fourier transform infrared (ATR-FTIR), C K edge near edge X-ray adsorption fine structure (NEXAFS) spectroscopies, and 2-D WAXS in transmission were used to characterize surface orientation in thermotropic liquid crystalline copolyester (TLCP) injection-molded plaques to varying depths into the samples. Injection-molded TLCPs have bimodal orientation states due to contributions from "skin" and "core" regions resulting from extensional and shear flow, respectively, in the mold. The NEXAFS is sensitive to the orientation of the molecular *pi* orbital of backbone phenyl groups of the top 2 nm of a surface. ATR-FTIR obtained using a Herrick Seagull^{TM} variable angle reflectance accessory is sensitive for dichroic ratios to a depth of 5 microns. Orientation parameters derived from the 1502/cm absorption band for equivalent positions are often typically about 5 to 10 percent less by ATR-FTIR than by NEXAFS. The orientational states are being correlated with physical properties of injection-molded TLCP samples.

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Robert Bubeck
Michigan Molecular Institute

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