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**Orientation distribution and process modeling of thermotropic liquid crystalline copolyester (TLCP) injection-moldings**[1] ROBERT BUBECK, Michigan Molecular Institute, JUN FANG, WESLEY BURGHARDT, Northwestern University, SUSAN BURGARD, Michigan Molecular Institute, DANIEL FISCHER, NIST — The influence of melt processing conditions upon mechanical properties and degrees of compound molecular orientation have been thoroughly studied for a series of well-defined injection molded samples fabricated from VECTRA (TM) A950 and 4,4'-dihydroxy-a-methylstilbene TLCPs. Fracture and tensile data were correlated with processing conditions, orientation, and molecular weight. Mechanical properties for both TLCPs were found to follow a "universal" Anisotropy Factor (AF) associated with the bimodal orientation states in the plaques determined from 2-D WAXS. Surface orientations were globally surveyed using Attenuated Total Reflectance – Fourier Transform Infrared (ATR-FTIR) spectroscopy and C K edge Near-Edge X-ray Absorption Fine Structure (NEXAFS). The results derived from the two spectroscopy techniques confirmed each other well. These results along with those from 2-D WAXS in transmission were compared with the results of process modeling using a commercial program, MOLDFLOW(TM). The agreement between model predictions and the measured orientation states was gratifyingly good.

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