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**Effect of crystalline form on phase transformation kinetics of poly(l-lactic acid)** JEFFREY KALISH, SHAW LING HSU, University of Massachusetts - Amherst — Films of poly(l-lactic acid) (PLLA) were crystallized from the amorphous solid phase at various temperatures. At crystallization temperatures lower than 120°C, the disordered alpha' phase appears, but at crystallization temperatures greater than 120°C, the alpha crystal forms. Crystallization kinetics was followed using far infrared (FIR) spectroscopy. Vibrations in the FIR range can be used to directly assess the interchain interactions which are sensitive to changes in chain conformation. Interactions involving carbonyl and methyl functional groups have previously been observed in PLLA crystals. The relative rates of formation of the crystalline trans-gauche-trans conformation versus the interchain interactions were also investigated. Coexistence of the two crystalline forms has been investigated at crystallization temperatures near 120°C. The alpha' crystalline form shows weaker interactions and lower thermal stability. By annealing at elevated temperatures, interchain interactions strengthened continuously.

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