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Evidence of LLPS in melts of broadly distributed ethylene copolymers via deuterium labeling and effect on self-nucleation and crystallization XUEJIAN CHEN, Florida State University, GEORGE D WIGNALL, LILIN HE, ORNL, Biology and Soft Matter Division, RUFINA G ALAMO, Florida State University — Ethylene copolymers with a broad comonomer composition range (0.5 – 13 mol %) display unusual self-nucleation behavior. Cooling from different, progressively lower melt temperatures, these materials display the expected accelerated crystallization kinetics and a range of lower melt temperatures from which the crystallization rate is observed to decrease. This unusual inversion of the crystallization rate was postulated to arise from the onset of liquid-liquid phase separation (LLPS) between comonomer-rich molecules and molecules with less comonomer. We have now reproduced the broad distribution by blending multiple narrow components covering the same range of composition with partial deuteration in the components with low comonomer content. SANS investigations confirm that these broad copolymers display an UCST behavior.

Xuejian Chen
Florida State University

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