



Topic Summary:

The low recycling rates of post-consumer polyolefins has origins in thermodynamics. Polyolefins enter the recycling stream in mixed form, and are subsequently melt processed as blends. Due to thermodynamic incompatibilities they form micro-domains and upon subsequent cooling, crystallize in a cascading fashion, frequently with poor interfacial adhesion - causing brittleness. While such cascading crystallization is critical to the final mechanical properties, it is poorly understood. Here we employ multi-modal methods (rheology, Raman, x-rays and calorimetry and optical microscopy) to study the crystallization kinetics and associated rheology in immiscible blends of high density polyethylene and isotactic polypropylene, both under quiescent and shear conditions. We find strong differences in polypropylene crystallization as a function of molar mass, composition and shear – with domain morphology playing a major role. Our results indicate the importance of rheology and processing on the structure and ultimately the properties of mixed waste-stream crystallizing polymers.



Dr. Kalman Migler

Materials Science and Engineering
Division

National Institute of Standards and
Technology

<https://www.nist.gov/people/kalman-migler>

Please arrive 15 mins early to grab some pizza and snacks!!!

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