Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **2576** Type: **Oral not-in-competition (Graduate Student) / Orale non-compétitive (Étudiant(e) du 2e ou 3e cycle)**

Crystallization Studies of Highly Monodisperse Oligomeric Poly(Ethylene Oxide)

Tuesday 4 June 2019 09:00 (15 minutes)

Polydispersity can significantly affect the physics properties of polymers. In this study we show the differences in poly(ethylene oxide) oligomer crystallization between monodisperse and polydisperse samples as an example. Commercial polymers even with a low polydispersity index (PDI) of about 1.01, still contain a rather broad distribution of different molecular weights. In this study we produced highly monodisperse PEO through evaporative purification of a M_n 600 PEO sample, achieving a PDI significantly lower than the as purchased sample, as measured by mass spectroscopy. Melting temperatures were obtained using differential scanning calorimetry (DSC). Based on the Gibbs Thomson relation, we show that during crystallization, some monodisperse samples form crystal lamellae with both extended chains and once-folded chains. In contrast, polydisperse samples have been shown to only contain extended chains in the crystal form. The fact that we are able to tune the melting temperature through annealing treatment on the crystal validates the existence of both folded and extended chains in the monodisperse samples.

Authors: Ms YIN, Junjie (University of Waterloo); Dr RAEGEN, Adam (University of Waterloo); Prof. FORREST, James (University of Waterloo)

Presenter: Ms YIN, Junjie (University of Waterloo)

Session Classification: T1-1 Soft Matter AM-1 (DCMMP) | Matière molle AM-1 (DPMCM)

Track Classification: Symposia Day - Soft Matter Canada 2019