Abstract Submitted
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Semi-crystalline morphologies of linear and cyclic poly(ϵ-caprolactones) in the diffusion-limited film thickness regime GIOVANNI KELLY, AMELIA BERGESON, FARIHAH HAQUE, SCOTT GRAYSON, JULIE ALBERT, Tulane Univ — Thin and ultrathin films of semi-crystalline polymers have been studied for decades due to their far-reaching applications including opto-electronic materials and biological studies of drug delivery and cell adhesion. This body of work has focused on every aspect of crystallization, from the fundamental thermodynamics and kinetics of crystal growth to methods for affecting crystalline morphologies via blending with other polymers. Due to significant synthetic challenges, one area where progress has lagged behind is the study of non-linear architectures, especially ring polymers. However, pioneering work by polymer chemists around the world has closed that gap, and we are beginning to observe important differences between ring and linear polymers in bulk materials. As a complement to those advances, this work aims to compare the morphologies of linear and cyclic poly(ϵ-caprolactones) (PCL) observed in heavily-confined ultrathin films where crystal growth is diffusion-limited. Understanding how confinement effects alter morphology will provide invaluable insight into differences in crystal growth as a function of molecular architecture.

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