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Preparation of high purity linear and cyclic poly(ε-caprolactone) to demonstrate physical and thermal properties. FARIHAH HAQUE, Tulane University, RICARDO PEREZ, University of the Basque Country, JUAN LOPEZ, Simon Bolvar University, SCOTT GRAYSON, Tulane University, ALEJANDRO MUELLER, University of the Basque Country — Cyclic polymers are differentiated from more common linear polymers by their ring-like topology and lack of chain ends. Unlike linear counterparts, cyclic polymers are characterized with many unique properties including reduced hydrodynamic volume, improved thermal stability, and reduced domain spacing in self-assemblies. Improved synthetic techniques utilizing controlled polymerizations, quantitative click reactions, and preparative GPC have enabled the production of high purity linear and cyclic poly(ε-caprolactone) (PCL) analogs. To date, cyclic PCL is known to exhibit increased rates of crystallization and the formation of more thermodynamically stable crystals. Since then, blends of linear and cyclic PCL have demonstrated unique thermal properties, deviating from the aforementioned trend, suggesting possible threading of linear within the cyclic. The work herein aims to continue exploring this unique phenomenon of cyclic polymers and to further develop an understanding of their structure-property relationships.

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