

Abstract Submitted
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Progress in the synthesis and purification of cyclic polymers: towards accurate physical characterization SCOTT GRAYSON, Department of Chemistry, Tulane University — The physical characterization of ring polymers has been the subject of substantial experimental efforts since the first reports of high molecular weight cyclic polymers nearly 40 years ago. Despite numerous investigations, a number of fundamental questions remain unresolved in large part because of the difficulty in preparing cyclic polymers with high purity. A number of recent synthetic improvements offer promise to address this limitation. One such method, the “click” cyclization approach, exhibits unprecedented versatility in backbone chemistry and provides ring polymers and their exact linear analogs for direct physical comparison. Recent efforts have confirmed the ability to prepare cyclic polymers using this route with greater than 99.5% purity. Using this approach the thermal properties of cyclic polycaprolactone and their linear analogs have been probed, including trends in glass transition and crystallization temperatures. Furthermore, blends of linear and cyclic polycaprolactone show a deviation in their observed crystallization temperature relative to a simple mixing law, suggesting that threading events are affecting their thermal properties.

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