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The linear rheological responses of cyclic polyoctenamer melt MIAO HU, GREGORY MCKENNA, Department of Chemical Engineering, Texas Tech University, YAN XIA, ROBERT GRUBBS, JULIE KORNFIELD, Division of Chemistry and Chemical Engineering, California Institute of Technology — There is continuing interest in the dynamics of macrocylic polymers or polymer rings. Here we are working with novel polyoctenamer rings synthesized by a ring opening metathasis polymerization (ROMP) route that precludes linear contamination when pure catalyst is used. While the rings are polydisperse in their molecular weights, the method permits synthesis of extremely high molecular weight entitities. Here we report results on the dynamic moduli and the zero shear rate viscosities of both the cyclic polyoctenamer of Mw up to nearly 400,000 g/mol (which is nearly 50 entanglements) and the linear analogue. Comparisons will be made with prior literature results on rings made by ring closure methods in dilute solution where contamination with linear chains was problematic and where the entanglement density was less than 20.

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