

A Facile Route to Alternating Arylene-Ethynylene Macrocycles via Depolymerization of *o*-Phenylene-Ethynylene Copolymers

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Shape persistent arylene-ethynylene macrocycles have drawn interest for their applications in supramolecular chemistry and electronics. The synthesis of these compounds has often relied on lengthy, stepwise cross-coupling methodology, which allows for a high degree of control over product structure but tends to result in low yields due to the reaction proceeding under kinetic control. Because it is under thermodynamic control, alkyne metathesis has proven to be a more efficient method for synthesizing these macrocycles with less synthetic steps required and typically higher yields during the ring-forming step. Unfortunately, attempts to apply metathesis to systems containing more than one monomer have given poor results.

By utilizing metathesis-based depolymerization of arylene-ethynylene copolymers where one of the co-monomers is an *o*-phenylene-ethynylene unit, a method for the synthesis of alternating arylene-ethynylene macrocycles has been developed. The metathesis of an alternating copolymer results in the formation of the alternating macrocycle as the major product with no evidence of the single-monomer macrocycles. This is in contrast to metathesis on a mixture of monomers and it appears that the alternating copolymer is predisposed to form the alternating hybrid macrocycle.

