

Nanoscale π -conjugated ladder oligomers and polymers

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Ladder polymers are defined by the IUPAC as polymers “which consist of an uninterrupted sequence of rings with adjacent rings [...] having two or more atoms in common”.^[1] Herein we report on π -conjugated rails that are connected repeatedly by stiff rungs to create a well-defined and rigid ladder oligomers and polymers. The synthesis focuses on two ladder polymers: A donor-acceptor ladder polymer and a three stranded ladder polymer. The synthesis begins with the construction of monomers from four building blocks. The synthesis is characterized by *Sonogashira* couplings. Ladder monomers can be polymerized according to the zipping strategy, whereby a single-stranded polymer precursor is polymerized first. Afterward, an intramolecular zipping reaction closes the open prepolymer.

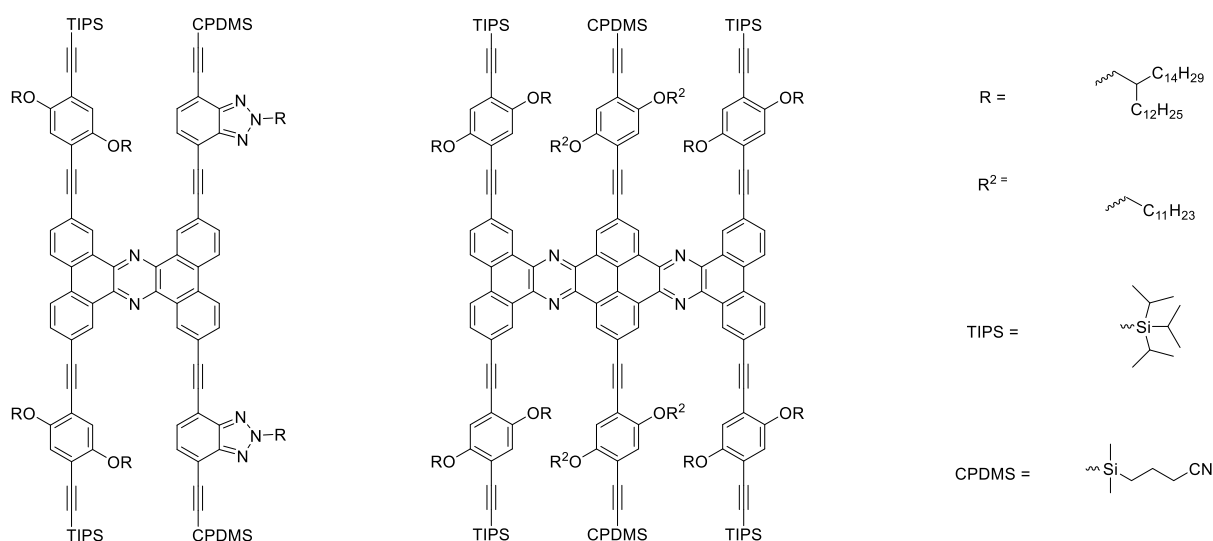


Figure 1: Left: donor-acceptor monomer; Right: three-stranded monomer.

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