Category

Synthesis of Materials and Unnatural Products

Key words

furans

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electropolymerization

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Conducting Polyfurans by Electropolymerization of Oligofurans

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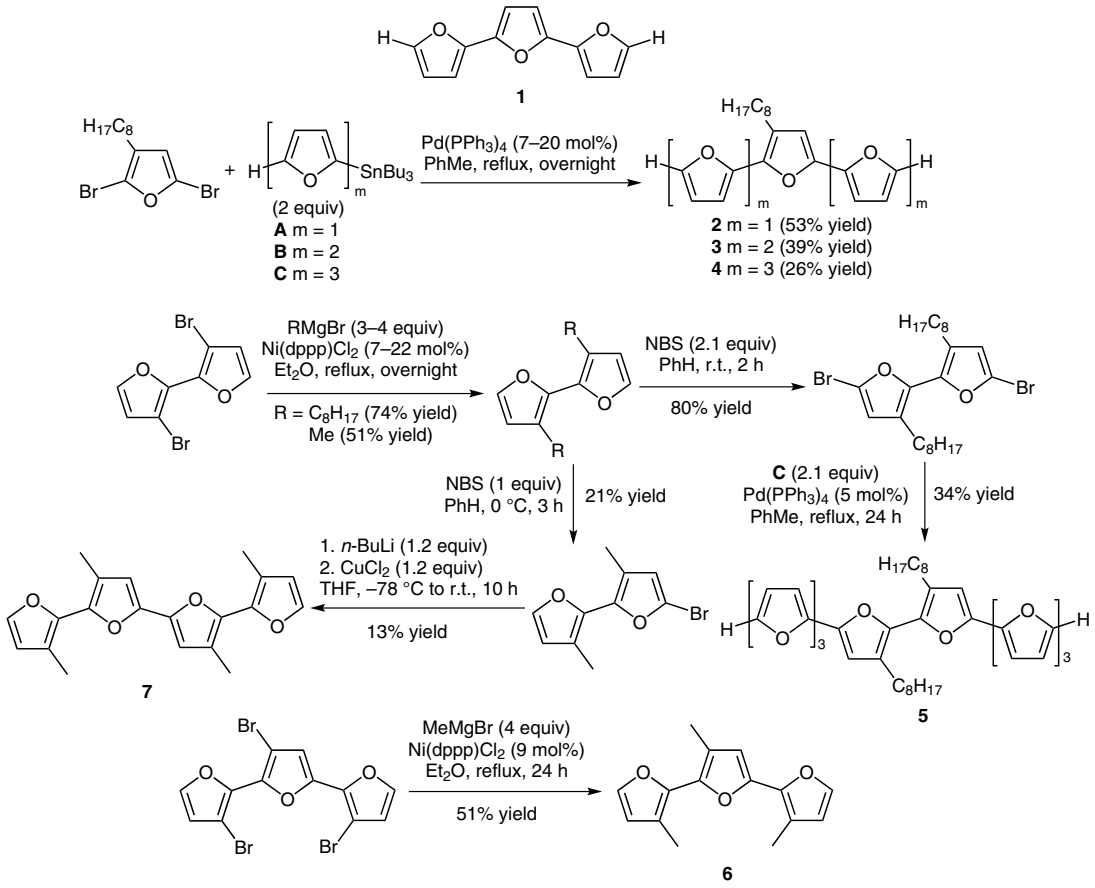
Electropolymerization Furnishes Conducting Polyfuran Films



Significance: Polyfurans have received less research attention than their pyrrole and thiophene analogues. This is due in part to the high oxidation potential of furan. Harsh electropolymerization conditions result in defect-rich, non-conducting polyfuran. To lower the potential required to form polyfuran, Sheberla and co-workers synthesize oligofurans **1**–**7**. Potentiostatic polymerization for all of these monomers occurs at 0.75 V (vs. Ag/AgCl). The resulting polyfurans are found to have conductivities comparable with electropolymerized polythiophenes.

Comment: Electropolymerization of furan occurs at potentials in excess of 1.8 V (vs. Ag/AgCl). The onset oxidation potentials for **1**–**7** are under 0.7 V, and follow expected trends based on conjugation length and degree of alkyl substitution. The high-quality polyfurans also undergo oxidative doping at lower potentials than analogous poly(terthiophene)s, resulting in increased stability under the operating conditions. This study may establish polyfuran as a competitor to other conducting polymers.

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