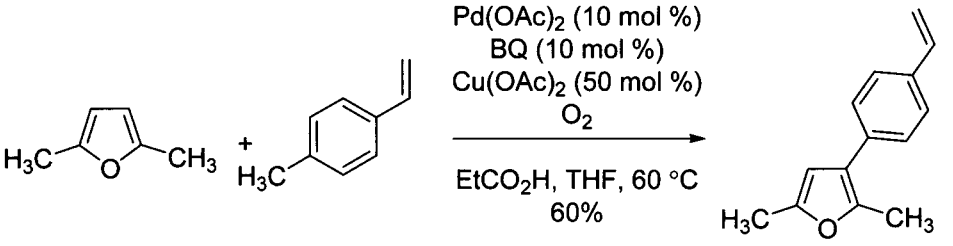
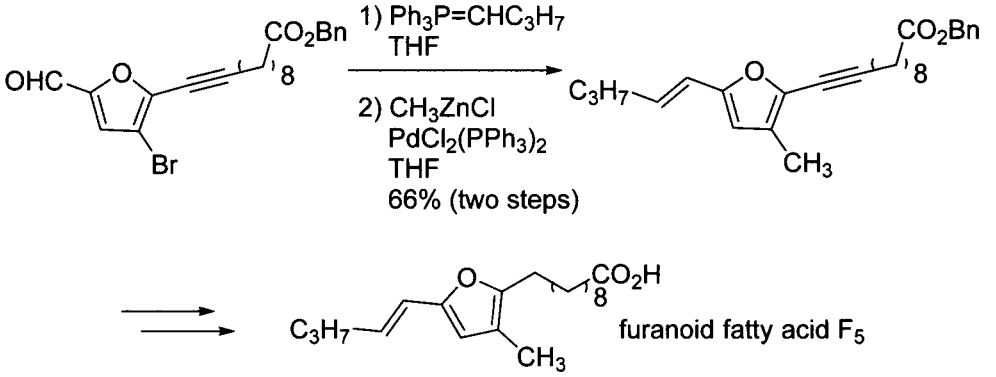


Bach and Krueger used a Negishi coupling to synthesize a derivative of the naturally occurring furanoid fatty acid F_5.[24,25] Treatment of 3-bromofuran with methylzinc chloride gave the corresponding trisubstituted furan in 66% yield (over two steps). Two additional steps were required to generate the desired fatty acid derivative.



4.2.2 Furan and Benzofuran Synthesis

4.2.2.1 Furan Synthesis

The Feist–Bénary and Paal–Knorr syntheses are commonly employed in the preparation of furan ring systems. In special cases where furan derivatives are difficult to prepare by other methods, Diels–Alder and retro-Diels–Alder reactions have become important methods for their synthesis. Finally, transition metal-catalyzed cyclization and cycloisomerization reactions have recently gained significant attention for their utility in the synthesis of highly functionalized furans. Key examples of these syntheses are highlighted in the sections below.

Feist–Bénary Furan Synthesis

The Feist–Bénary furan synthesis, first described in 1902,[26] is especially useful for the synthesis of substituted furan rings. This reaction occurs