SL07 Palladium– and Nickel–Catalyzed Coupling Reactions of Alkyl Electrophiles

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Despite the tremendous accomplishments that have been described in the development of palladium- and nickel-catalyzed carbon–carbon bond-forming processes, it is nevertheless true that many significant opportunities remain. For example, to date the overwhelming majority of studies have focused on couplings between two sp^2-hybridized reaction sites (e.g., an aryl metal with an aryl halide).

As of 2001, there were few examples of palladium- or nickel-catalyzed coupling reactions of alkyl electrophiles. During the past several years, we have pursued the discovery of palladium- and nickel-based catalysts for coupling activated and unactivated primary and secondary alkyl electrophiles that bear β hydrogens. Our recent efforts to develop broadly applicable methods, including enantioselective processes, will be discussed.

Figure 1. Some carbon–carbon bond-forming processes of interest.