Suzuki Coupling with an N-Heterocyclic Carbene–Palladium Catalyst

Significance: N-Heterocyclic carbenes (NHCs) L bearing poly(ethylene glycol) chains promoted the palladium-catalyzed Suzuki–Miyaura coupling of aryl chlorides with arylboronic acids to give the corresponding biaryls in up to 96% yield (eq. 1). The borylation of aryl chlorides with B₂pin₂ also proceeded under similar catalytic conditions to afford the corresponding aryl boranes in up to 68% yield (eq. 2).

Comment: In the reaction of chlorotoluene with phenylboronic acid, the catalytic performance of L (n = 17) was superior to that of other NHC ligands, such as IMes or IPr, and to NHC ligands L with shorter poly(ethylene glycol) chains (n = 0, 4, ~12).