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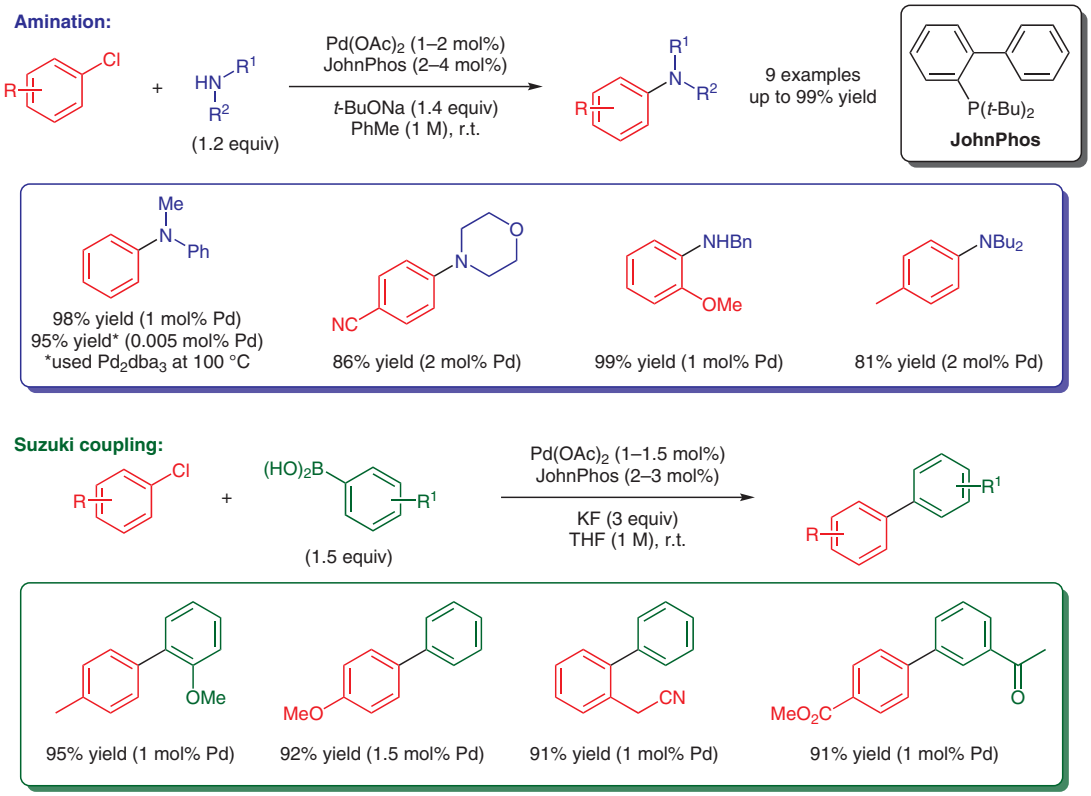
A Highly Active Catalyst for the Room-Temperature Amination and Suzuki Coupling of Aryl Chlorides
Angew. Chem. Int. Ed. **1999**, *38*, 2413–2416.

Biaryl Ligands for C–N Coupling



Significance: Aryl carbon–nitrogen bonds are ubiquitous in nature and important pharmaceuticals; however, a mild and catalytic method for their formation has been a major hurdle for organic chemistry. In the late 1990s Buchwald described a new series of dialkylbiaryl phosphine ligands that allowed for mild and efficient palladium-catalyzed cross-couplings. Further work led to the development of JohnPhos, which enabled room temperature palladium-catalyzed intermolecular amination. This seminal work set the stage for widespread adoption of Buchwald ligands in both industry and academia. Herein, Buchwald reports the discovery of JohnPhos, a bulky biaryl ligand, for amination and Suzuki coupling under mild conditions.

Comment: The reported ligand, JohnPhos, contains bulky *tert*-butyl groups, which were crucial to facilitate the difficult reductive elimination of the aryl carbon–nitrogen bond. A variety of amines including anilines and alkylamines were tolerated in the reaction. Notably, very low loadings of palladium could be employed for the C–N coupling; however, the reaction required higher temperature. The capability of the new ligand was also explored in Suzuki coupling. The Suzuki coupling could also be run under similarly mild conditions with a variety of aryl halides and aryl boronic acids.

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Synfacts 2019, 15(01), 0047 Published online: 14.12.2018
DOI: 10.1055/s-0037-1611389; **Reg-No.:** L15818SF

Category
Metals in Synthesis

Key words
palladium catalysis
Buchwald–Hartwig amination
Suzuki coupling