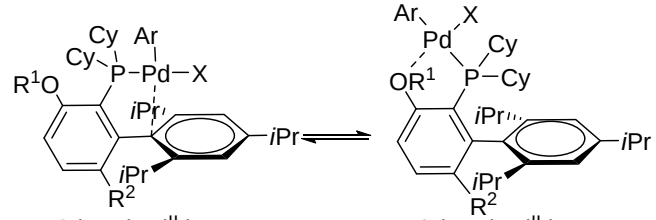
TERPHENYL PHOSPHANES: A NEW GENERATION OF LIGAND FOR PALLADIUM-CATALYZED AMINATION OF ARYL HALIDES WITH PRIMARY AND SECONDARY ARYL AMINES

Ji-cheng Shi, Fabin Zhou, Lixue Zhang, Jianhui Xu, and Zerun Lu

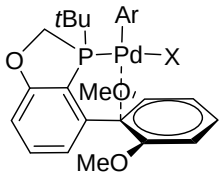
College of Chemistry, Maoming Technology Center of Organic Materials, Guangdong University of Petrochemical Technology, Maoming 525000, China

The palladium-catalysed amination of aryl halides has become a centrally important technology in the preparation of pharmaceutically relevant molecules.[1] Unfortunately, this transformation still lacks generality, especially for highly *ortho*-functionalized substrates.[2] A terphenyl phosphine ligand (TXPhos) has been developed, for which the effective function of biaryl phosphines to promote palladium-catalysed amination is guaranteed and in which the bulkiness of the flexible cyclohexyl substituent is further increased. This system has shown excellent performance in the palladium-catalysed arylation of both primary and secondary anilines. Moreover, combinations of highly functionalized substrates including both partners possessing *ortho* ester, acetyl, nitrile and nitro groups have been unprecedentedly realized in the arylation of primary anilines with aryl chlorides at 0.5 mol% catalyst loading. Furthermore, for the first time, KOAc and NaOAc have been found to be effective bases and even are the best choice in the amination of 2-nitrochlorobenzene

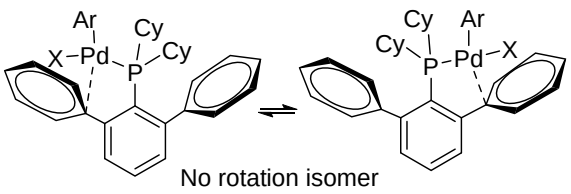
A. Buchwald's strategy to control the favorable isomer[3]



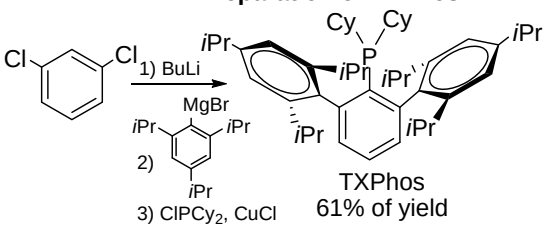
B. Tang's strategy[4]



C. Our strategy



D. Preparation of TXPhos



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[1] P. Ruiz-Castillo, S. L. Buchwald, *Chem. Rev*. **2016**, *116*, 12564-12649.

[2] S. Lin, et al., *Science* **2018**, *361*, 569-576.