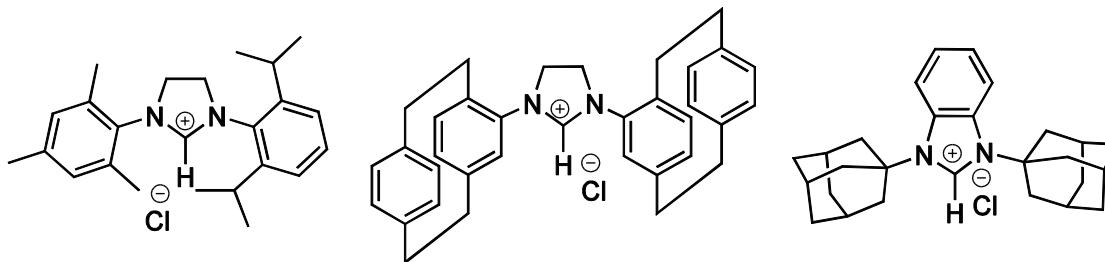
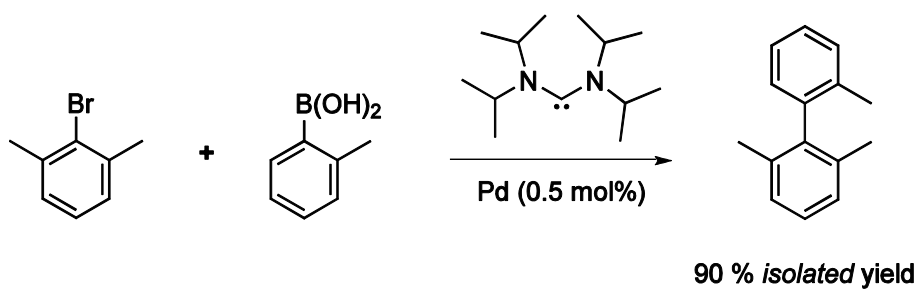


C-C/C-X Bond Formation

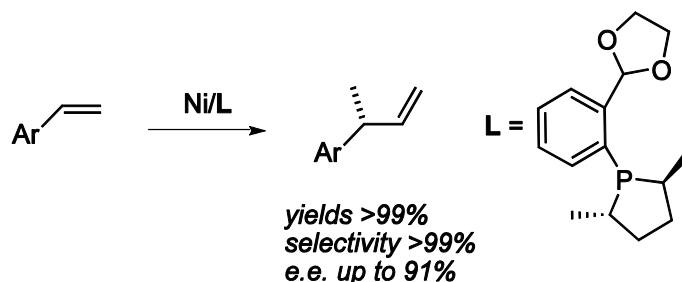
The diversity in the needs of synthetic chemists charged with the task of C-C or C-X bond formation is substantial. Whether protocols call for the coupling of aryls, alkyls or vinyls with carbon or heteroatom based substrates, access to a range of catalyst and ligand technologies is the key to successful syntheses. KCT maintains an expansive portfolio of such bond-forming technologies to meet the needs of synthetic chemists in all areas of the chemical industry.



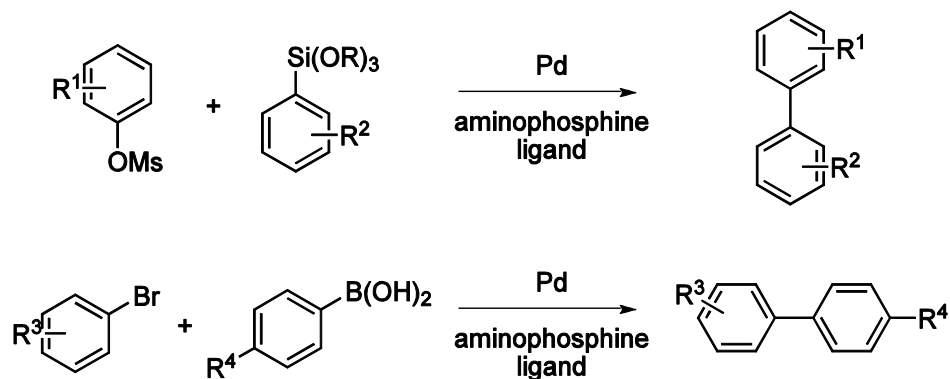
The importance of N-heterocyclic carbenes (NHC) in C-C and C-X bond formation reactions is widely recognized¹ and KCT offers a variety of established NHC precursors as part of its portfolio (above). More recently, acyclic diamino carbenes (ADC; below) have also been established as capable ligands in bond forming protocols such as Suzuki-Miyaura, Sonogashira and Heck couplings.² A range of chiral (exclusive to KCT) and achiral ADC precursors have been developed and are available.



Included among KCT's enabling technologies are hemilabile dialkylphospholanes (e.g. **L**, below) which have been found to be highly competent for the regio- and stereoselective hydrovinylation of styrenes.³ High yields, selectivities and e.e.'s of 3-arylbutenes are afforded via this nickel-mediated process.



KCTs industry-leading library of aminophosphine ligands is also available as a recently established tool in Pd-catalyzed cross-coupling.⁴ Researchers have shown aminophosphines to be useful in C-C bond-forming reactions such as the Hiyama coupling of aryl mesylates^{4a} and in Suzuki coupling.^{4b}



References:

- 1) *N-Heterocyclic Carbenes in Synthesis*, ed. S. P. Nolan, Wiley-VCH, Weinheim, 1st edn, 2006
- 2) Dhudisia, B.; Thadani, A. N. *Chem. Commun.* 2006, 668.
- 3) Zhang, A.; RajanBabu, T. V. *Org. Lett.* 2004, 6, 1515.
- 4) (a) So, C. M.; Lee, H. w.; Lau, C. P.; Kwong, F. Y. *Org. Lett.* 2009, 11, 317. (b) Guo, M.; Jian, F.; He, r. *Tetrahedron Lett.* 2006, 47, 2033.