RCC : HECK TYPE REACTION

Rhodium-Catalyzed Oxidative Olefination of C-H Bonds in Acetophenones and Benzamides

Frederic W. Patureau, Tatiana Besset, and Frank Glorius *Angew. Chem. Int. Ed.* **2011**, *50*, 1064 –1067

Institut des Sciences Moléculaires de Marseille

iSm2

UMR 7313

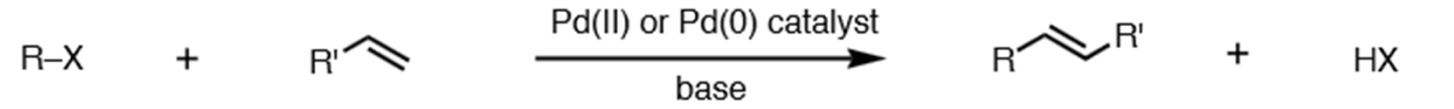
cnrs

stéréo

Sébastien Goudedranche, octobre 2013

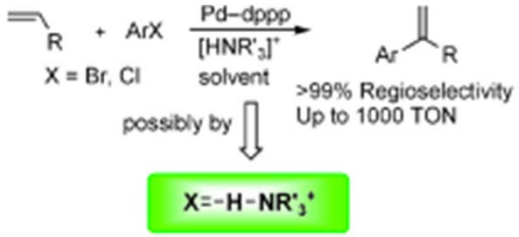
The Heck Reaction

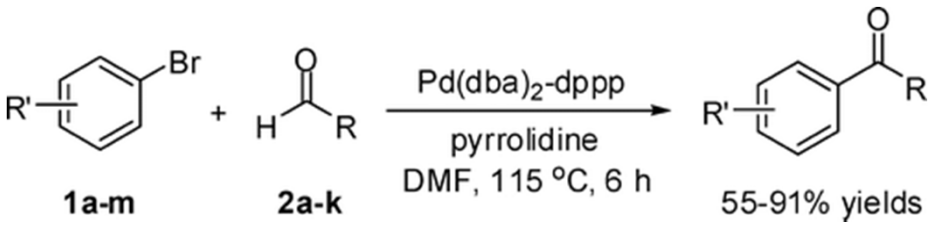
The palladium-catalyzed C-C coupling between aryl halides or vinyl halides and activated alkenes in the presence of a base is referred as the "Heck Reaction"

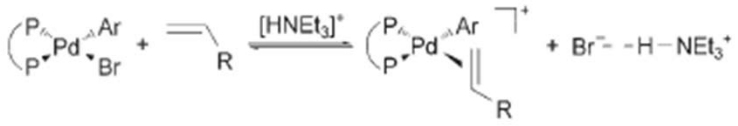


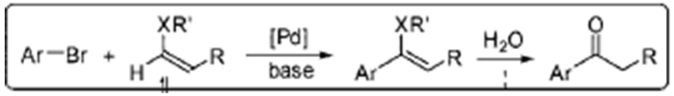
R = alkenyl, aryl, allyl, alkynyl, benzyl X = halide, triflate R' = alkyl, alkenyl, aryl, CO_2R, OR, SiR_3

"first reported in 1971"



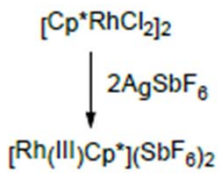


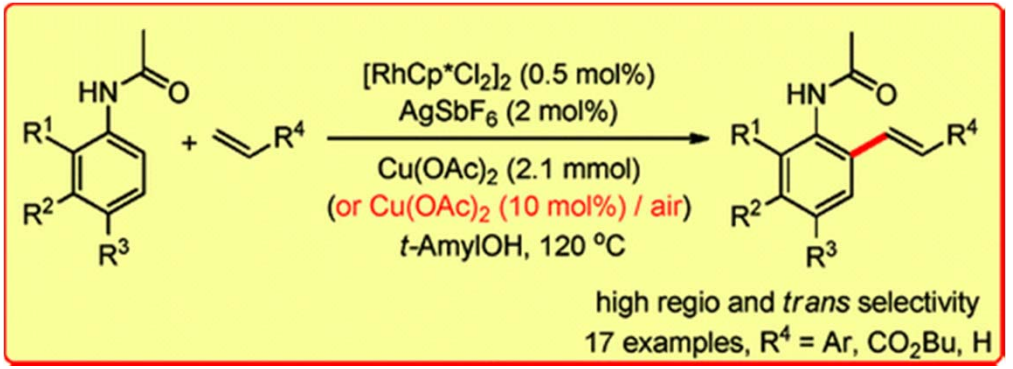




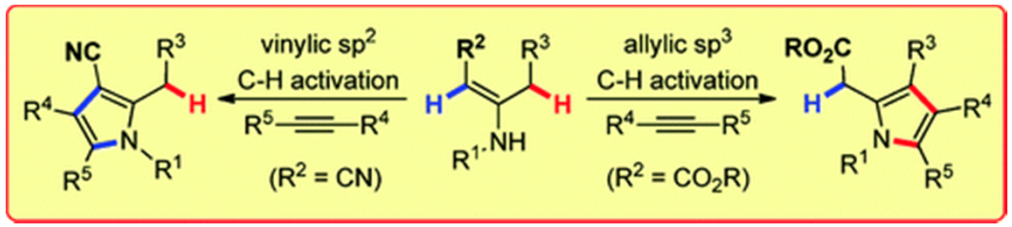
J. Mo, J. Xiao, *Angew. Chem. Int. Ed.*, **2006**, *45*, 4152-4157.
J. Ruan, O. Saidi, J. A. Iggo, J. Xiao, *J. Am. Chem. Soc.*, **2008**, *130*, 10510-10511

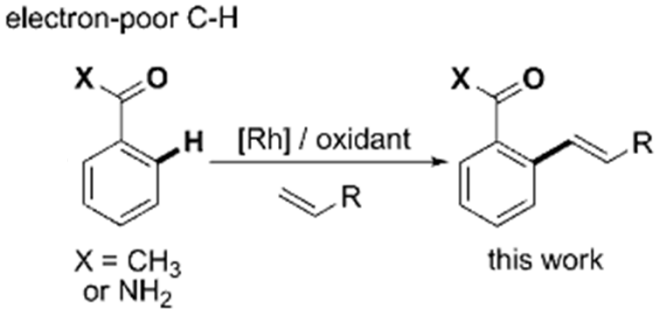
PREVIOUS WORK





Rich aromatic cycles give best results

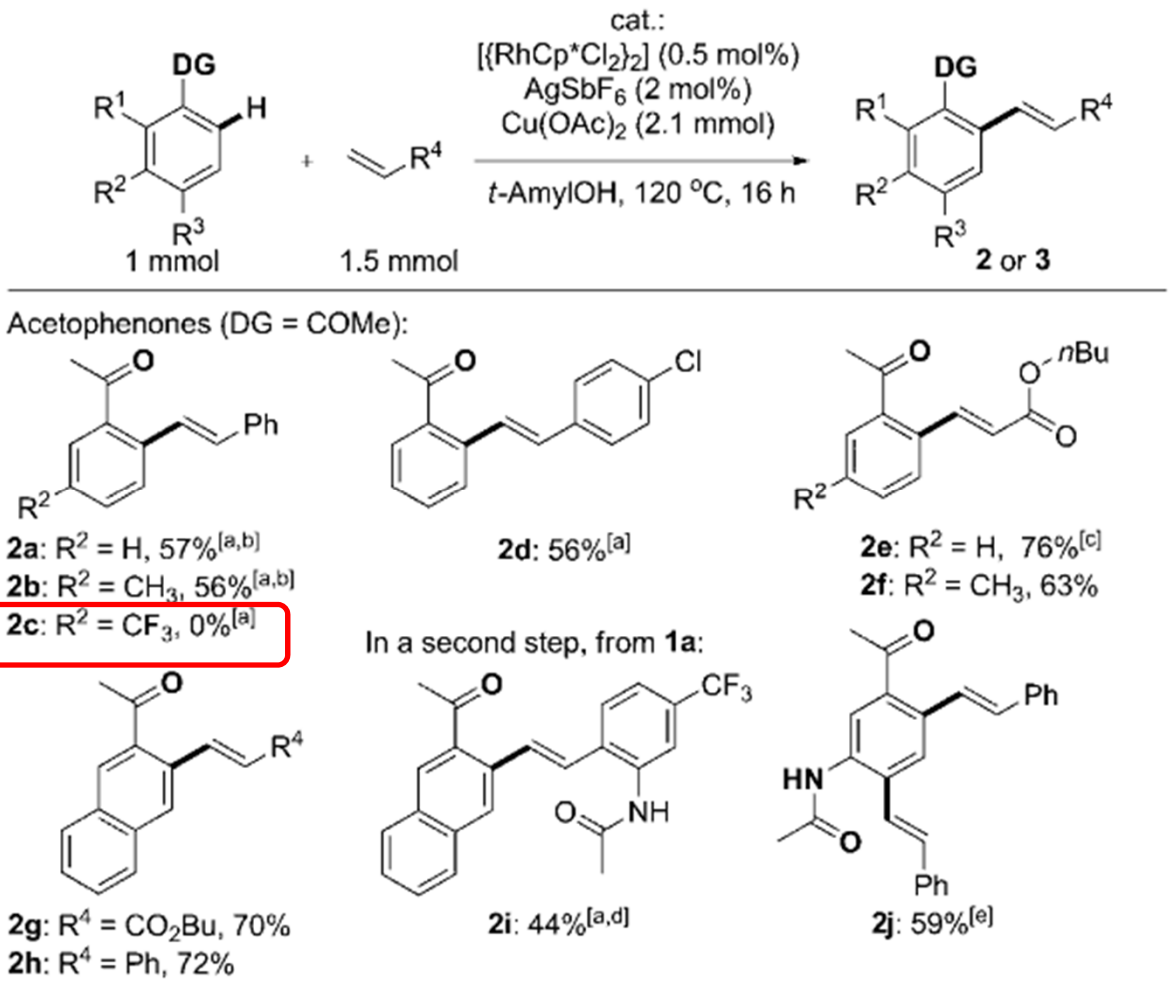




Acetophenones and Benzamides

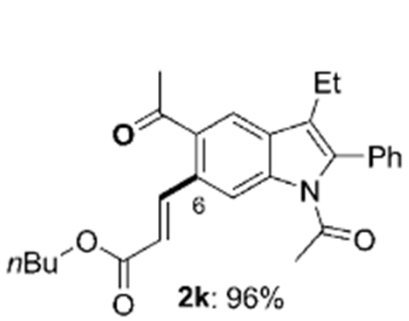
F. W. Patureau, F. Glorius, *J. Am. Chem. Soc.* **2010**, *132*, 9982,
S. Rakshit, F. W. Patureau, F. Glorius, *J. Am. Chem. Soc.* **2010**,*132*, 9585.
S. Murai, F. Kakiuchi, S. Sekine, Y. Tanaka, A. Kamatani, M. Sonoda, N. Chatani, *Nature* **1993**, *366*, 529

CURRENT WORK

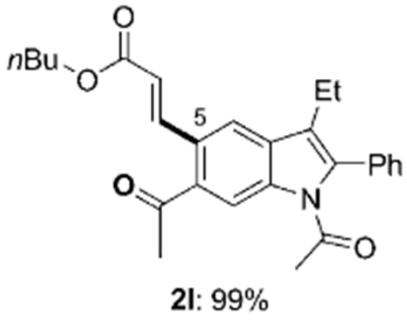


CURRENT WORK

heteroaromatics

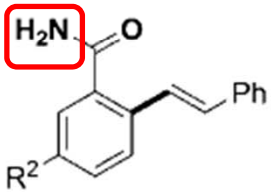


2k: 96%

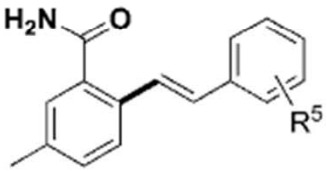


2l: 99%

Benzamides (DG = $CONH_2$): [b]

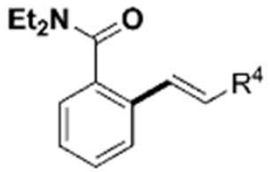


3a: R^2 = H, 60%
3b: R^2 = CH_3, 84%
3c: R^2 = CF_3, 86%



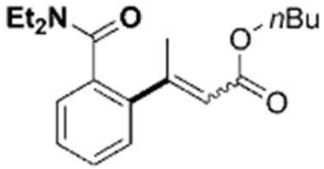
3d: R^5 = 4-Cl, 85%
3e: R^5 = 4-OMe, 74%[d]
3f: R^5 = 3-CF_3, 74%
3g: R^5 = 2-Ph, 40%
3h: R^5 = 2-Cl, 83%

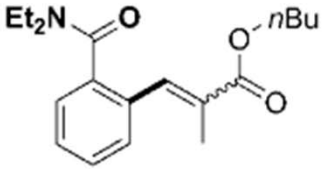
With pd chemistry
Around 20% yield



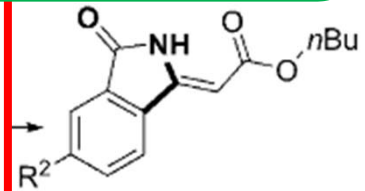
3i: R^4 = CO_2Bu, 95%

From 1,1- and 1,2-disubstituted olefins:





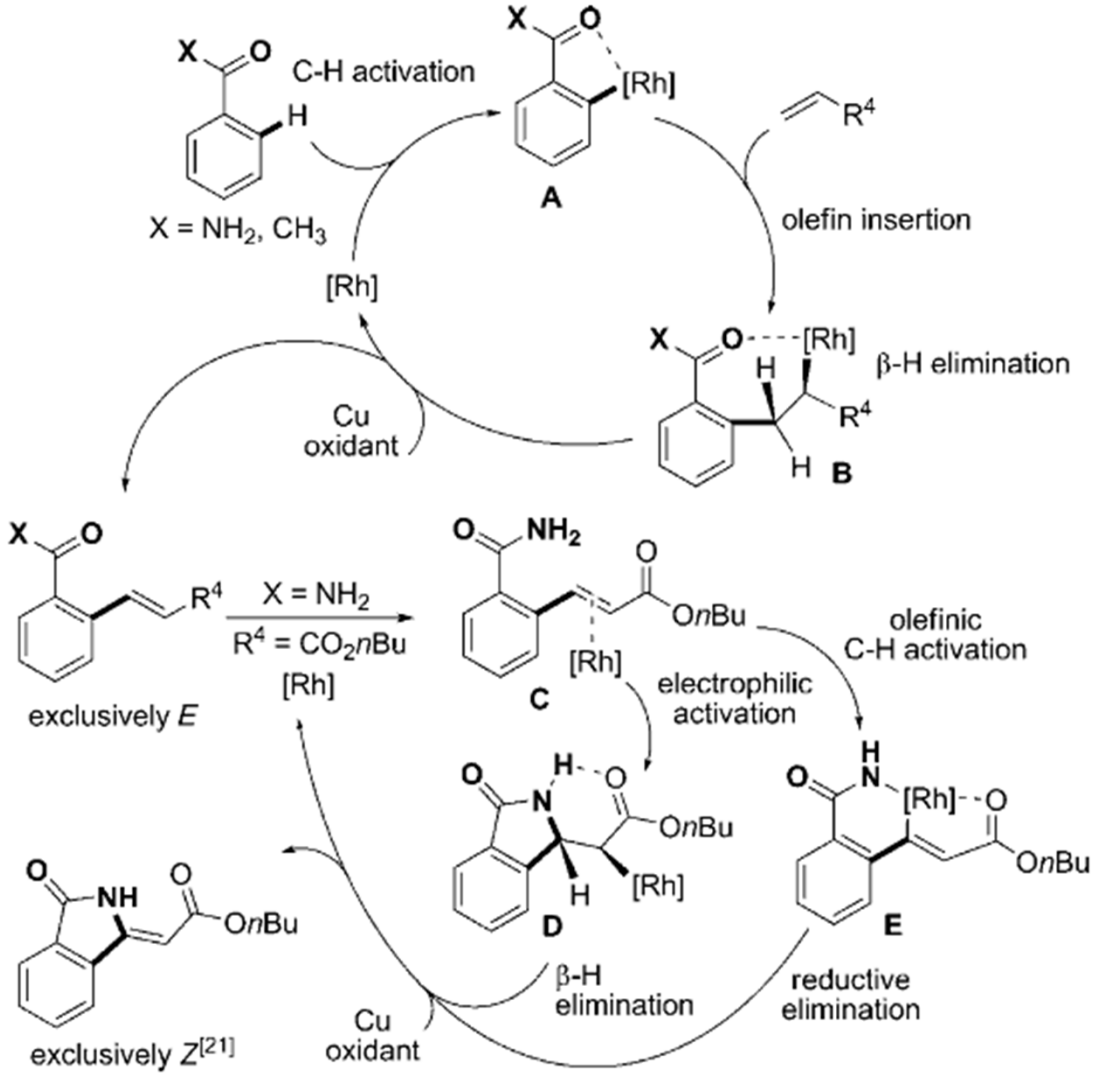
With butyl acrylate



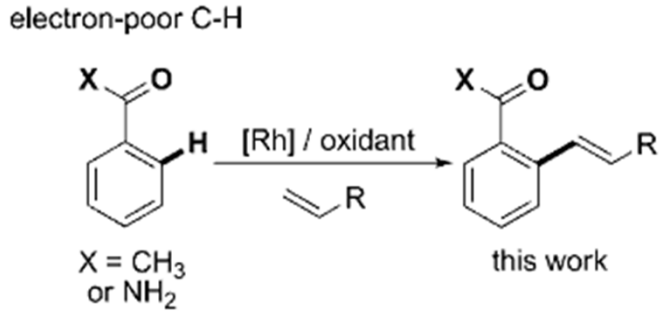
4a: R^2 = CH_3, 62%
4b: R^2 = NHAc, 31%

D.-H. Wang, K. M. Engle, B.-F. Shi, J.-Q. Yu, *Science* **2010**, *327*, 315

MECHANISTIC APPROCHE

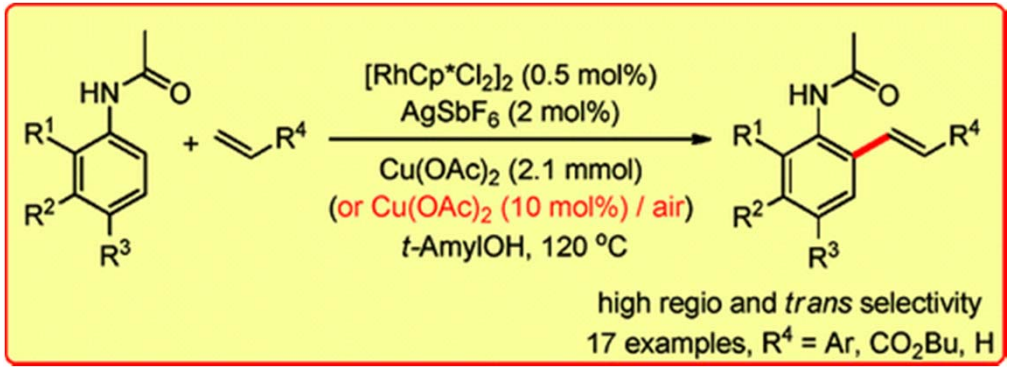


CONCLUSION



Yield up to 95%
with low catalyst loading

Is it a real advance? Probably...



Articles on this list are the most frequently cited ones among those **published in 2010 or 2011**. They have contributed the most to the journal's impact factor in 2012.

Merci de votre attention