

Dow Lecture Series

9:45 a.m. Thursday, September 17, 2015 • 331 Smith Hall

Professor

Bruce Lipshutz

Department of Chemistry & Biochemistry
University of California, Santa Barbara

Transitioning Organic Synthesis from Organic Solvents to Water: Following Nature's Lead

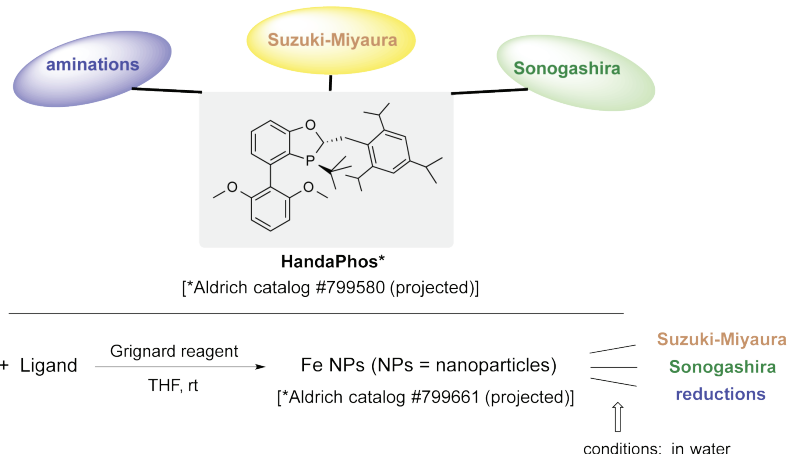


Research in green chemistry is highly focused on developing new technologies that offer such alternatives, with special emphasis on the use of water as the gross reaction medium (and not the solvent).

Website: <http://www.chem.ucsb.edu/lipshutzgroup/bruce-lipshutz>

Abstract

Three key reaction variables important to synthetic chemists include the reaction solvent, reaction temperature, and the choice of catalyst. The medium in which organic synthesis is performed is usually organic, while most reactions tend to require either heating or cooling. The catalyst typically involves a metal, and more often than not, is a precious metal such as palladium. This presentation will offer a win-win-win situation, addressing all of these issues from the standpoint of both economics and the environment. Several valued reactions in organic synthesis will be discussed that can be run in water, with most taking place at room temperature. Equally importantly, given that Pd is both costly and an endangered metal, these can now be effected using ppm levels of palladium, made possible by development of a new ligand, "HandaPhos", enabled by its use in aqueous nanomicelles composed of a designer surfactant; e.g., TPGS-750-M or Nok. Unpublished work will focus on this new Pd chemistry, and will then shift to a complementary technology that involves new Fe-based nanoparticles applied to such cross-couplings and related reactions of considerable interest, especially to the pharmaceutical industry.



References to reviews on earlier, published work:

Lipshutz, B.H.; Ghorai, S. *Green Chem.* **2014**, *16*, 3660; Lipshutz, B.H.; Isley, N.A.; Fennwald, J.C.; Slack, E.D. *Angew. Chem., Int. Ed.* **2013**, *52*, 10952; Lipshutz, B.H.; Ghorai, S. *Aldrichimica Acta*, **2012**, *45*, 3; Lipshutz, B.H. *Platinum Metal Reviews*, **2012**, *56*, 62; Lipshutz, B.H.; Ghorai, S. *Aldrichimica Acta*, **2008**, *41*, 59.

Host: Professor Jane Wissinger
Refreshments will be served prior to the seminar.