

C-H Bond Functionalization in Complex Organic Synthesis

Professor Dalibor Sames

*Department of Chemistry, Columbia University
New York, NY 10027, USA*

The possibility of direct and selective introduction of a new functionality (or a new C-C bond) via C-H bond functionalization has long intrigued practitioners of organic preparative chemistry. The value of such methods is readily apparent as multi-step synthetic sequences, often needed for establishing a new group at a preset position, may substantially be truncated. As a consequence, the possession of such synthetic ability will inspire new strategies for the assembly of organic compounds.

Although there is ample precedent for C-H bond activation by transition metals (C-H metallation) the next key challenges in this area include: (1) the ability to link the C-H bond activation with the subsequent C-C bond formation in an one-pot process; (2) achievement of high functional group tolerance of these new transition metal systems.

In this lecture, the impact of C-H bond functionalization on contemporary thought in organic synthesis will be discussed, followed by an overview of the synthetic program in Sames group. An update on new developments in the area of direct functionalization of heteroarenes and saturated heterocyclic compounds will be given (C-H arylation, C-H bond/alkene cross-coupling).