



# 2011-2012 POCC Lecture Series

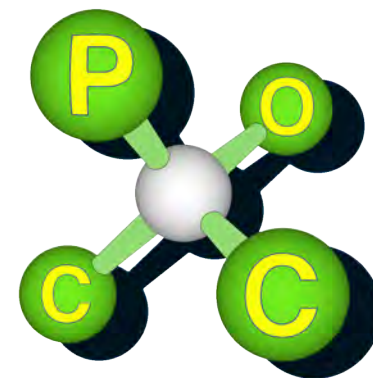
September 22, 2011, 8:00 PM

Prof. Gary A. Molander  
University of Pennsylvania

## *Organotrifluoroborates - New Reagents and Novel Reactivities*

Carolyn Hoff Lynch Lecture Hall  
Chemistry Building, University of Pennsylvania

The Philadelphia  
Organic Chemist's  
Club



POCClub.org

Professor Gary Molander was born in Cedar Rapids, Iowa. He received his B.S. degree at Iowa State University in 1975 working with Professor Richard C. Larock. He entered the graduate chemistry program at Purdue University in 1975, obtaining his Ph.D. degree in 1979 under the direction of Professor Herbert C. Brown. He joined Professor Barry Trost's group at the University of Wisconsin, Madison as a National Institutes of Health postdoctoral fellow in 1980, and in 1981 he accepted an appointment at the University of Colorado, Boulder, as an assistant professor of chemistry. He was promoted to Associate Professor in 1988 and Professor of Chemistry in 1990. In 1999 he joined the faculty at the University of Pennsylvania. In 2001 he accepted the Allan Day Term Chair in Chemistry, and in 2007 he was appointed the Hirschmann-Makineni Professor of Chemistry.

**Abstract:** Innumerable improvements on the original Suzuki coupling reaction have been recorded, including vastly improved catalyst/ligand systems, unique solvents, and enhanced experimental conditions. Until recently little effort has been expended toward further development of the most important component of the process – the organoboron reagent itself.

Boronic acids, commonly used for Suzuki-Miyaura coupling, are far from ideal. Many of these reagents are difficult to purify because they are waxy solids. Because of competitive protodeboronation, literature protocols for cross-coupling employ excess boronic acid to insure a complete conversion of the electrophilic component of the reaction.

Most importantly, all trivalent organoboron species are susceptible to reactions with important classes of reagents commonly utilized in organic synthesis. Consequently, these organoborons are normally either purchased or prepared and then utilized directly in the Suzuki cross-coupling reaction, limiting synthetic approaches to target molecules of interest.

The more robust organotrifluoroborate reagents to be discussed provide a solution to these problems, expanding the range of retrosynthetic pathways using Suzuki coupling reactions as key transformations for synthesis of valuable organic materials.