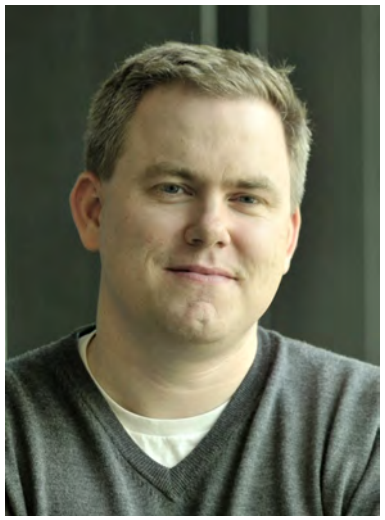

2011-2012 POCC Lecture Series

April 19, 2012, 8:00 PM

Prof. Karl A. Scheidt

Northwestern University

New Discoveries with Carbene Catalysis: Beyond the Benzoin and Stetter Reactions

Carolyn Hoff Lynch Lecture Hall
Chemistry Building, University of Pennsylvania

The Philadelphia Organic Chemists' Club

POCClub.org

Karl Scheidt is currently the Alumnae of Northwestern Teaching Professor, an Alfred P. Sloan fellow, an ACS Research Scholar, and past recipient of an NSF CAREER Award. He received his undergraduate degree from Notre Dame in 1994 while working in the laboratory of Professor Marvin J. Miller. Under the direction of Professor William R. Roush, he earned his Ph.D. from Indiana University and was a National Institutes of Health Postdoctoral Fellow in the laboratory of Professor David Evans at Harvard University. Ongoing research interests include organosilicon methodology and catalytic processes involving N-heterocyclic carbenes. Using carbene catalysis, his research group has developed numerous innovative approaches to carbonyl/acyl anion equivalents, homoenolate reactivity, hydroacylations of ketones, formal cycloadditions, Michael reactions, and acylvinyl anion equivalents. The Scheidt laboratory is also engaged in the synthesis of natural products with anti-tumor activity. With their discovery of the first catalytic enantioselective synthesis of flavanones, his laboratory is engaged in the synthesis of these medically promising compounds.

Abstract: New routes and methods to access bioactive compounds is a critical enterprise for the development of 21st century medicine. Inspired by Nature's conversion of pyruvic acid into a carbonyl anion equivalent with thiamin, we have established a research program discovering new strategies to access unusual nucleophilic species using N-heterocyclic carbenes as catalysts. As leaders in this rapidly growing area of carbene catalysis, we can generate powerful reactivity patterns such as carbonyl anions, homoenolates, enolates and promote useful redox process. These metal-free, catalytic reactions provide immense opportunities for development and application. In the presentation, a brief overview of the different reactivity patterns available using carbene catalysis will be presented, followed by our recent developments expanding this Lewis base manifold into new "rebound" and cooperative catalysis strategies.