University of Minnesota
Driven to Discover℠

Department of Chemistry

Seminar

9:45 a.m. Thursday, September 6, 2012 • 331 Smith Hall

Distinguished Teaching Professor

Thomas Hoye

Department of Chemistry
University of Minnesota

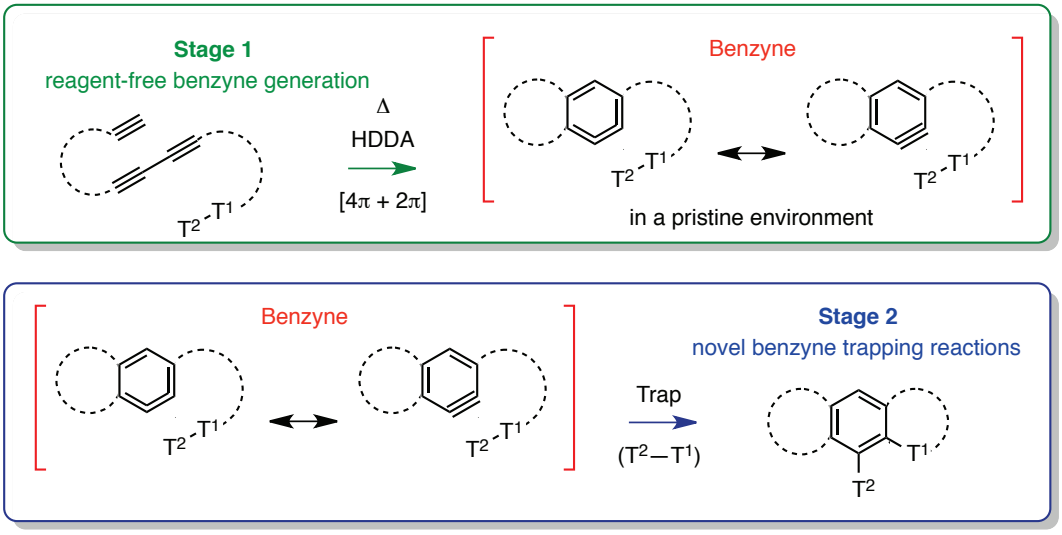
The Hexadehydro-Diels-Alder Reaction

Research interests include problems in natural product total synthesis, synthetic applications of organometallic chemistry, polymer synthesis, and many applications of nuclear magnetic resonance (NMR) spectroscopy. Collaborative projects are actively being pursued in the areas of antiangiogenic drug discovery, natural product isolation and structure determination, nanoparticle block-copolymer development for drug delivery, chiral chromatography solid support development, molecular electronics materials, and lamprey pheromones structure determination and synthesis.
Website: http://www.chem.umn.edu/directory/faculty.lasso?serial=449

Abstract

Since July 2011, a team of researchers in my laboratory has developed a remarkable process that we have named the hexadehydro-Diels–Alder (HDDA) reaction. This constitutes a net [4+2] cycloaddition reaction to produce a benzyne, which is then rapidly captured in a subsequent trapping event. The HDDA reaction is a rare example of a process that generates a high-energy, reactive intermediate by way of a highly exothermic (!) reaction. This two-stage benzyne generation/trapping cascade results in the rapid construction of structurally complex benzenoid products. This chemistry is both preparatively valuable and mechanistically enlightening. Fundamentally new modes of benzyne reactivity have been uncovered. I will discuss these developments in the historical context of underlying classical chemistry as well as from the perspective of its fundamental mechanistic and energetic features.

The Hexadehydro-Diels–Alder Cascade



Refreshments will be served prior to the seminar.