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

Stage 1
reagent-free benzyne generation

Δ
HDDA

[4π + 2π]

T2-T1

in a pristine environment

Stage 2
novel benzyne trapping reactions

Trap

(T2-T1)

Refreshments will be served prior to the seminar.