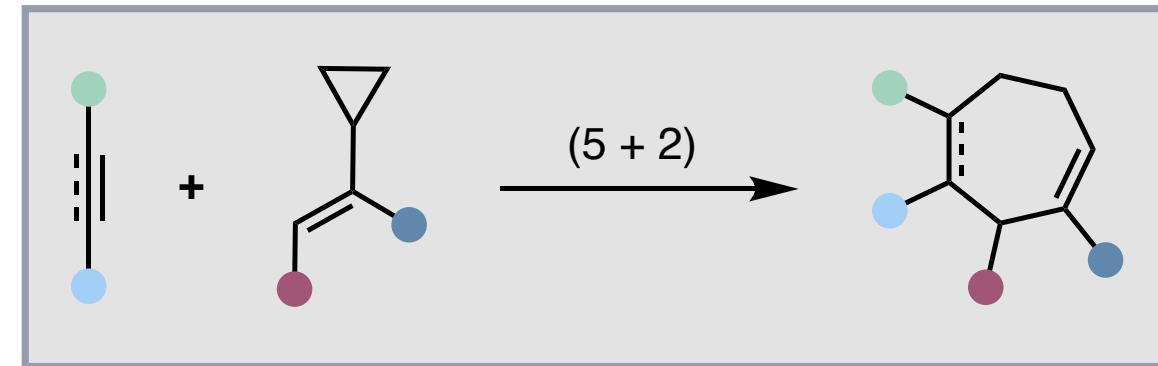




Vinylcyclopropane Cycloadditions

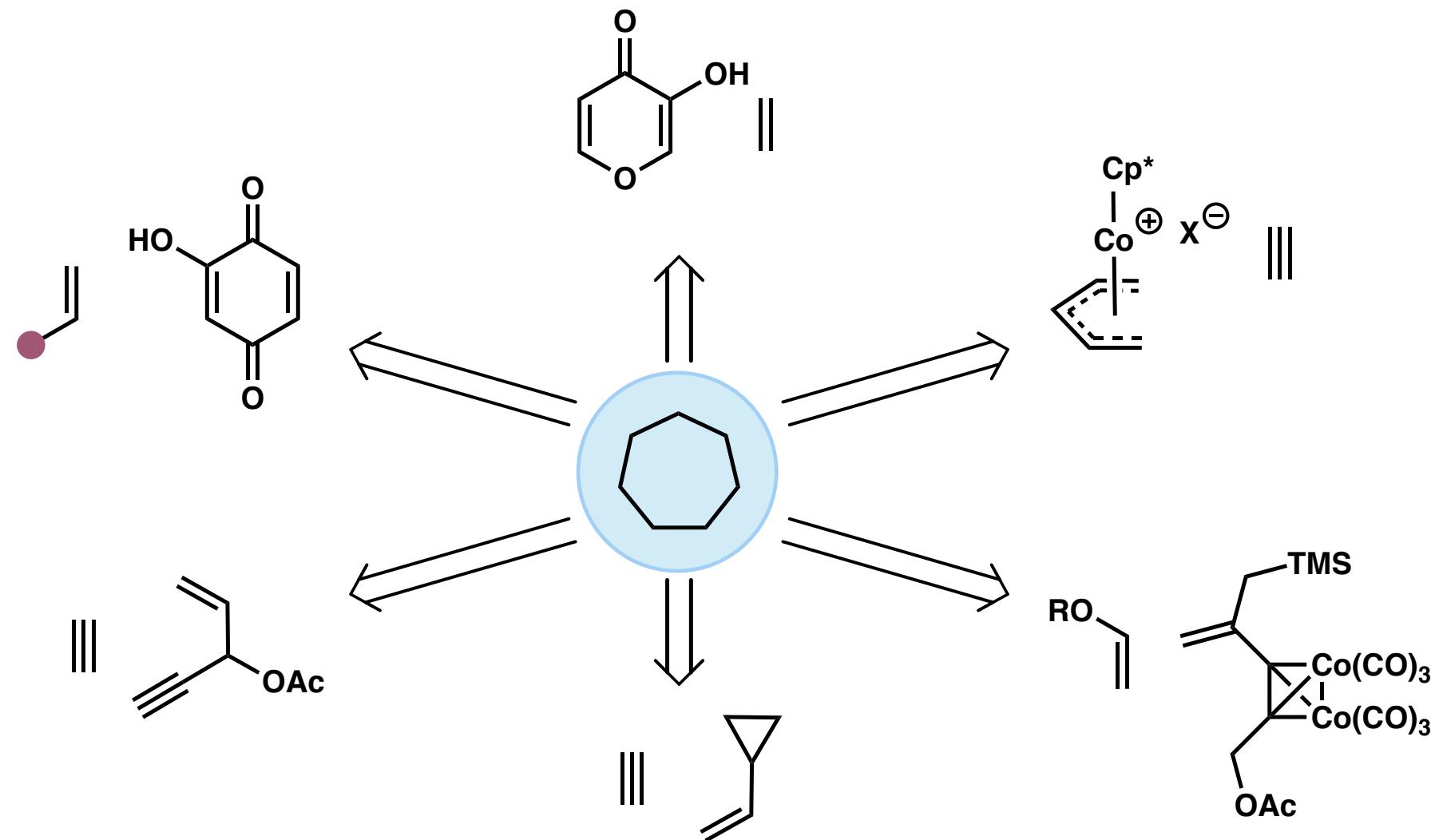


Nicholas A. Falcone
Literature Group Meeting
March 6th, 2020

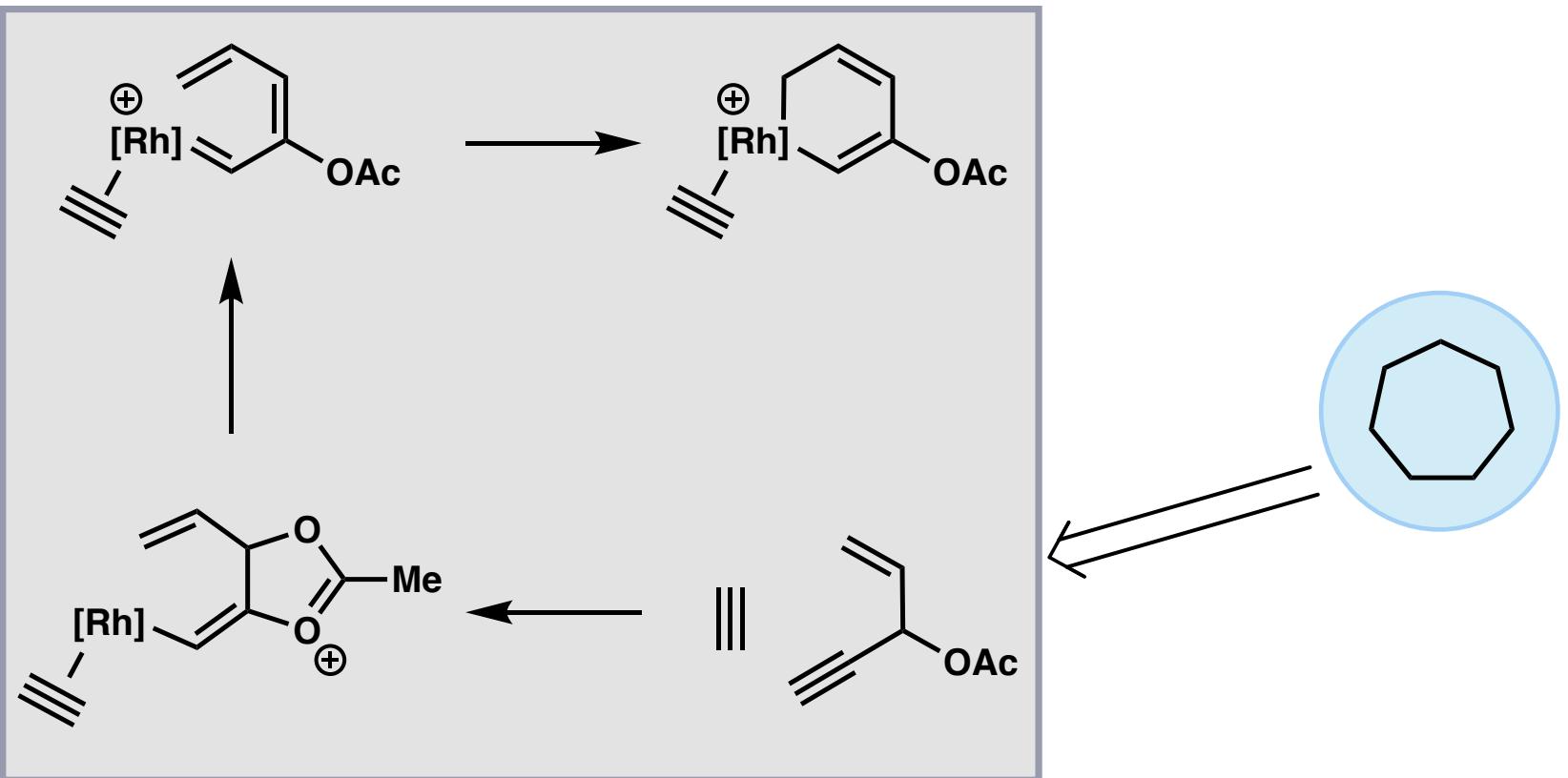
(5 + 2) Cycloadditions

- (5 + 2) Cycloadditions
- Early Examples of VCP (5 + 2)
- Intramolecular Reactions
 - Catalyst Selection
 - Regioselectivity of Insertion
 - Diastereoselectivity
- Mechanism
- Intermolecular Variants
- Synthetic Applications

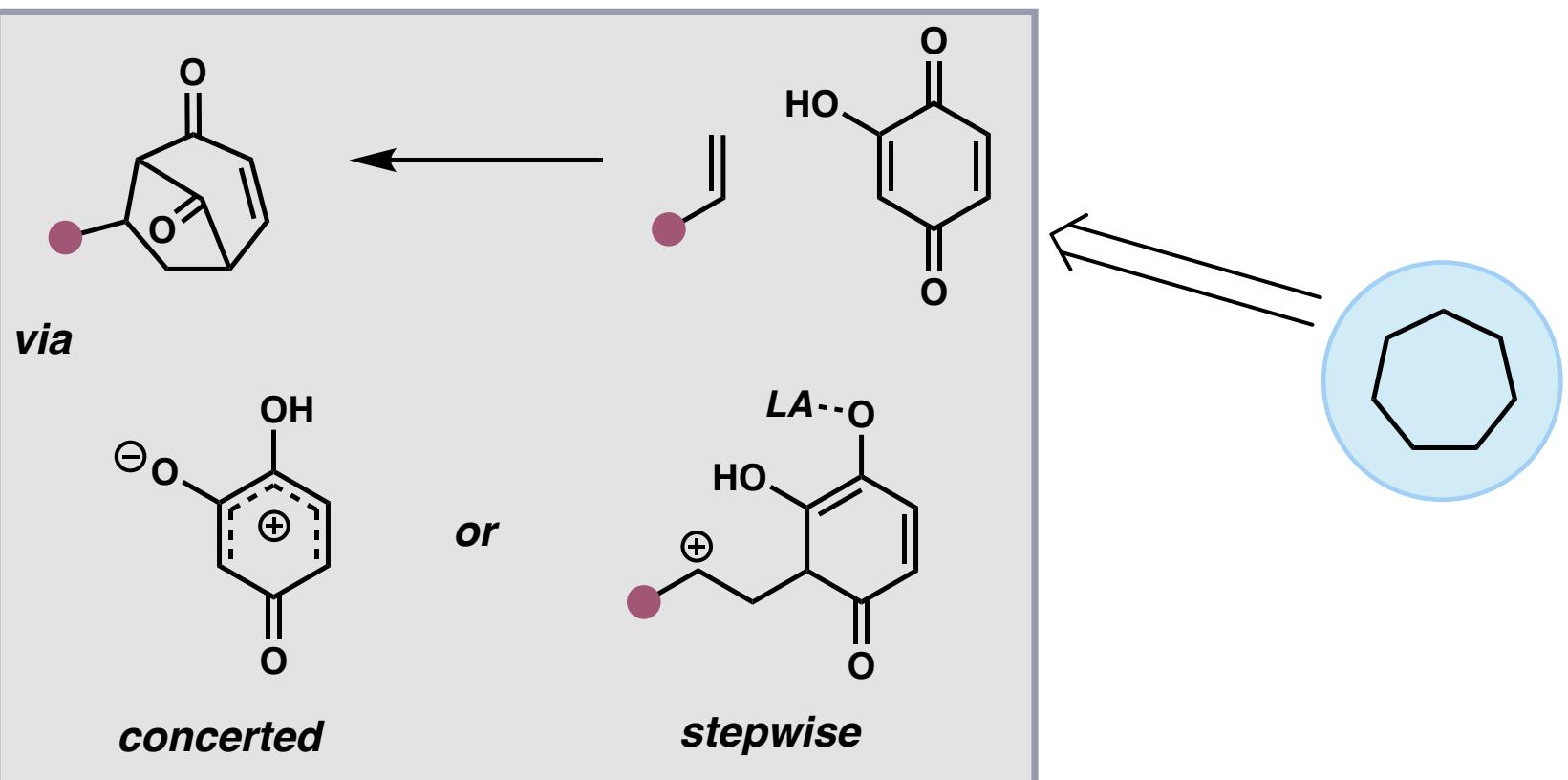
(5 + 2) Cycloadditions



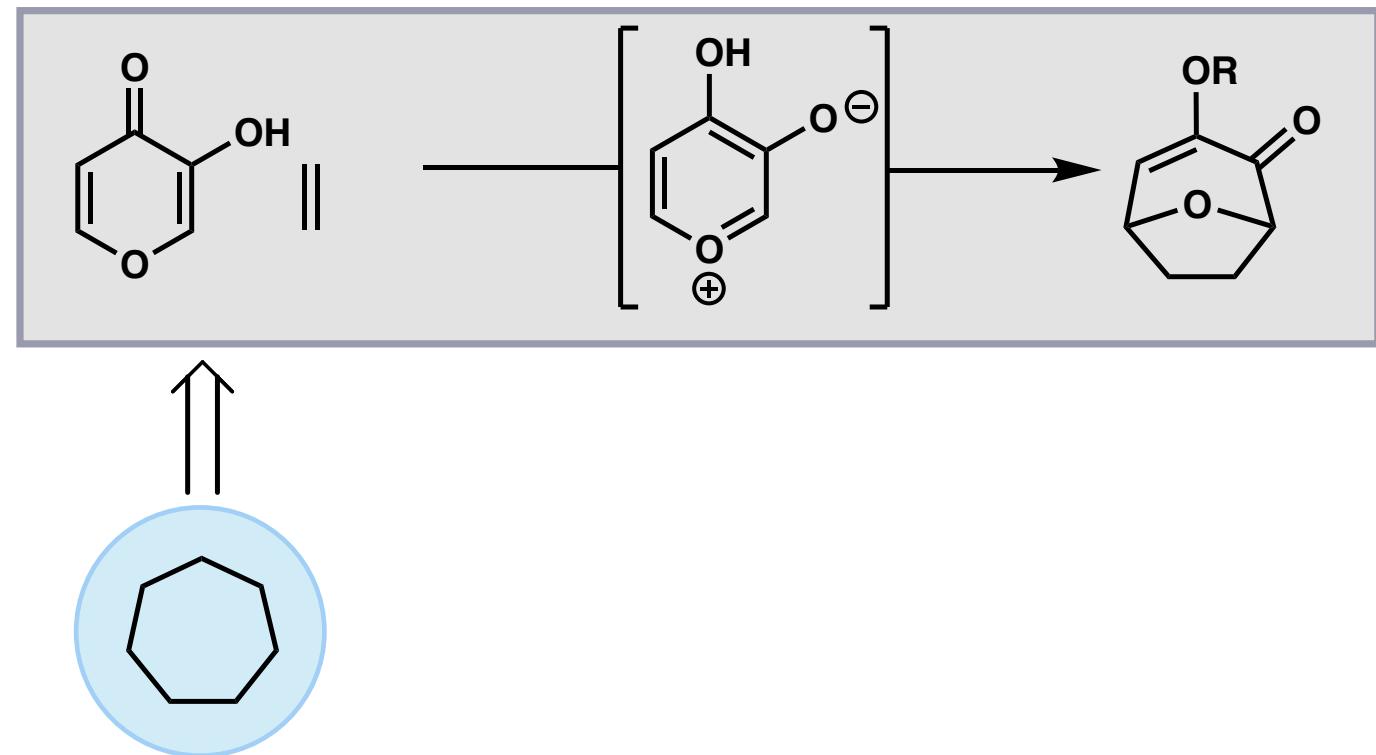
(5 + 2) Cycloadditions



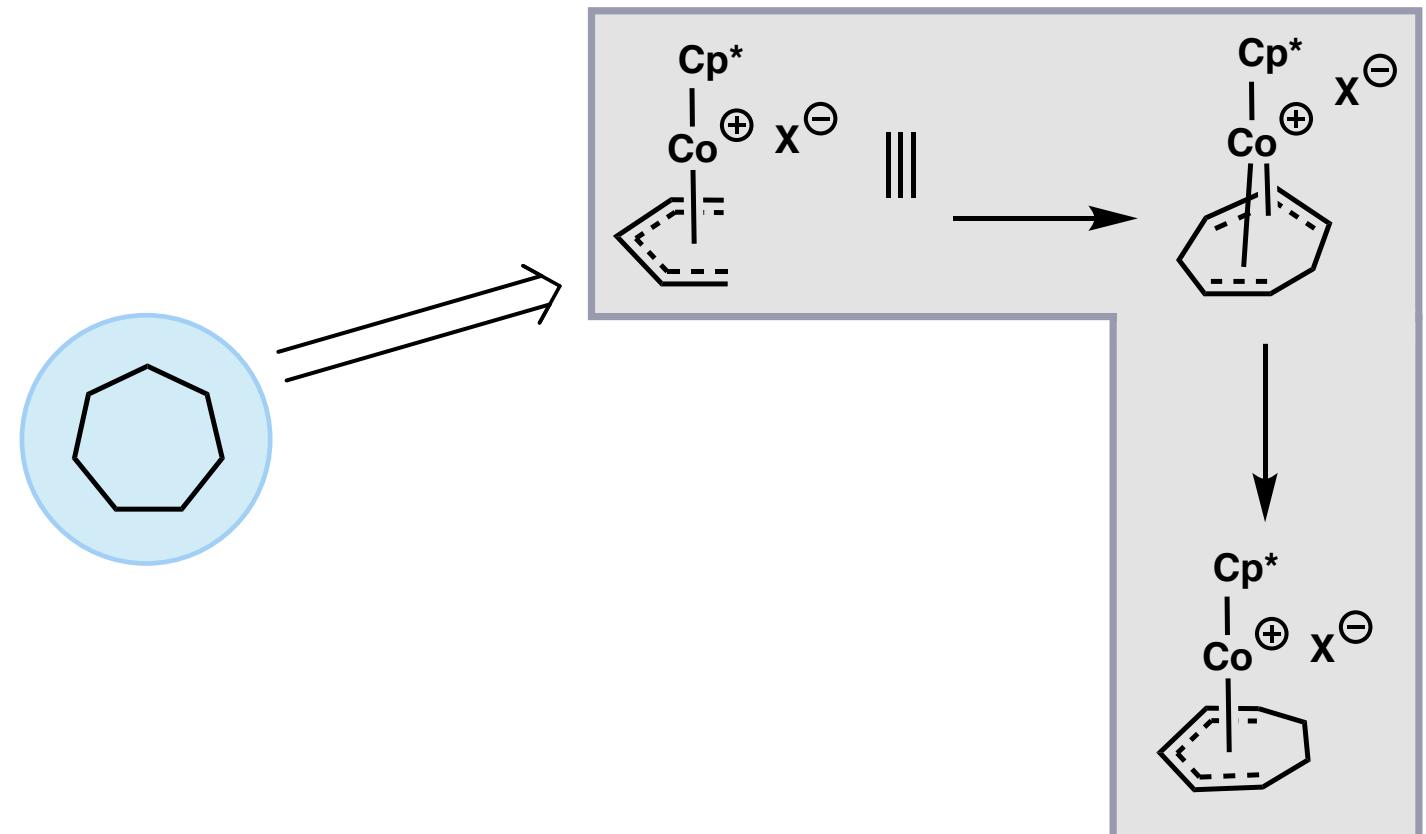
(5 + 2) Cycloadditions



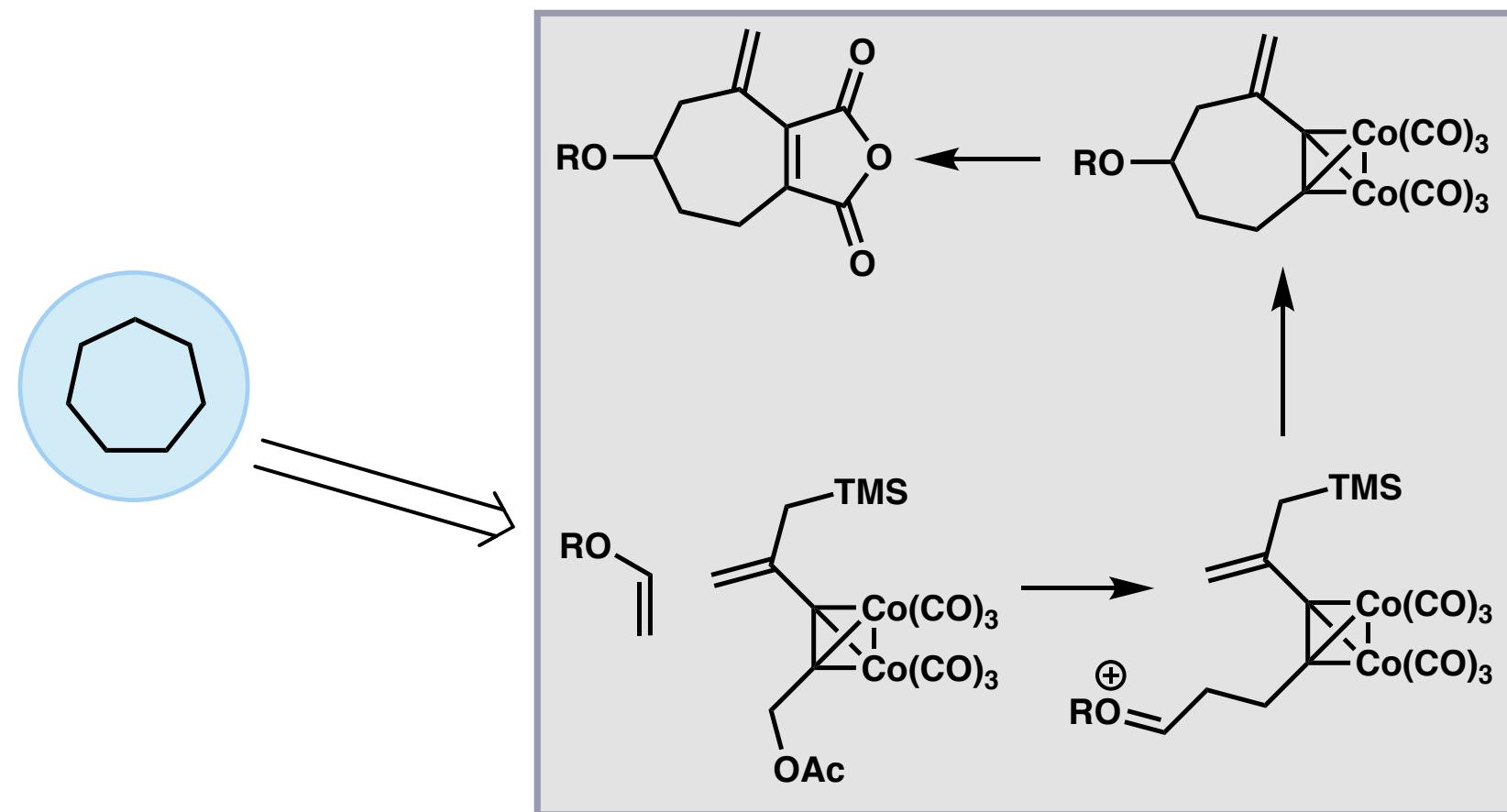
(5 + 2) Cycloadditions



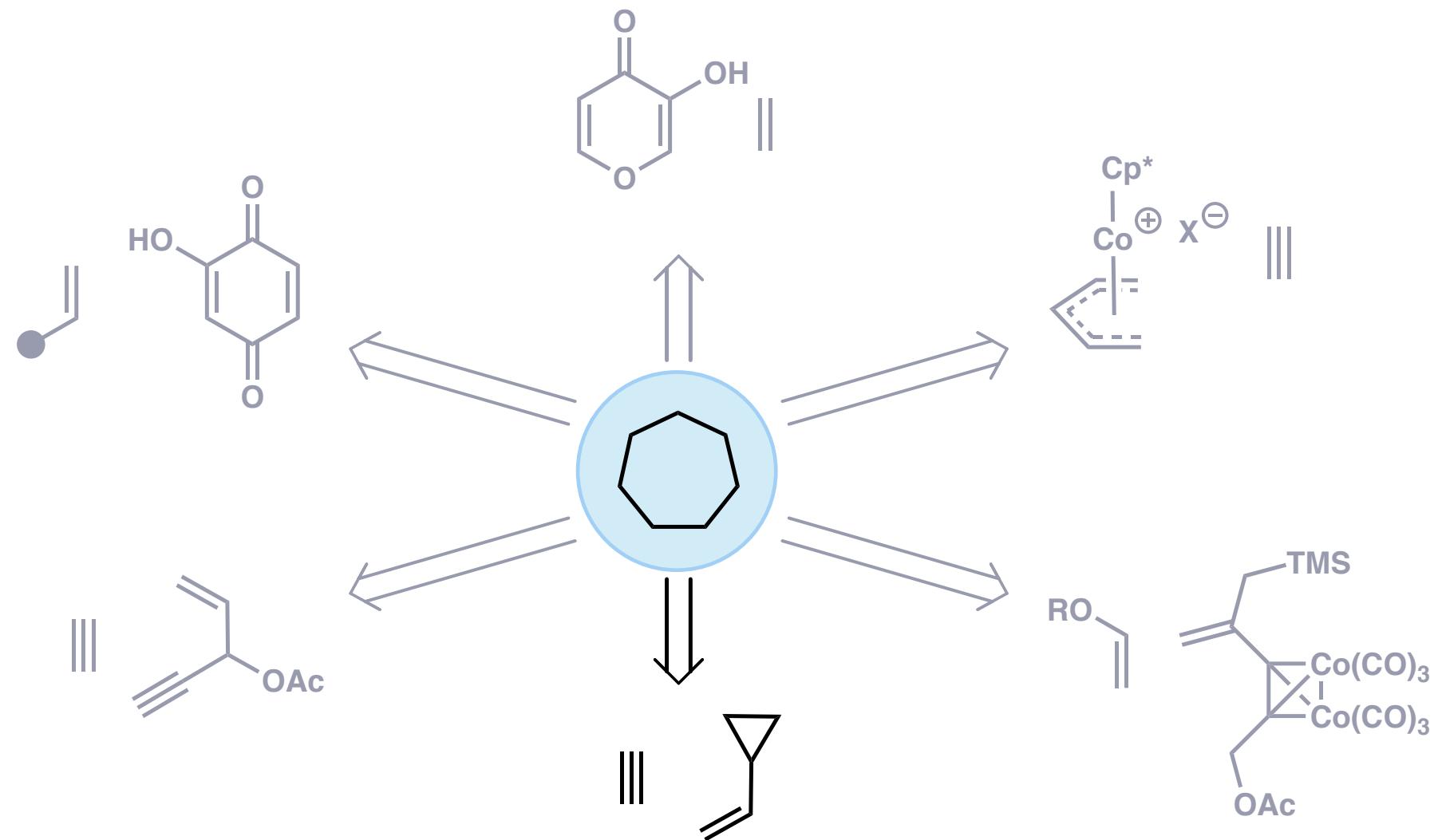
(5 + 2) Cycloadditions



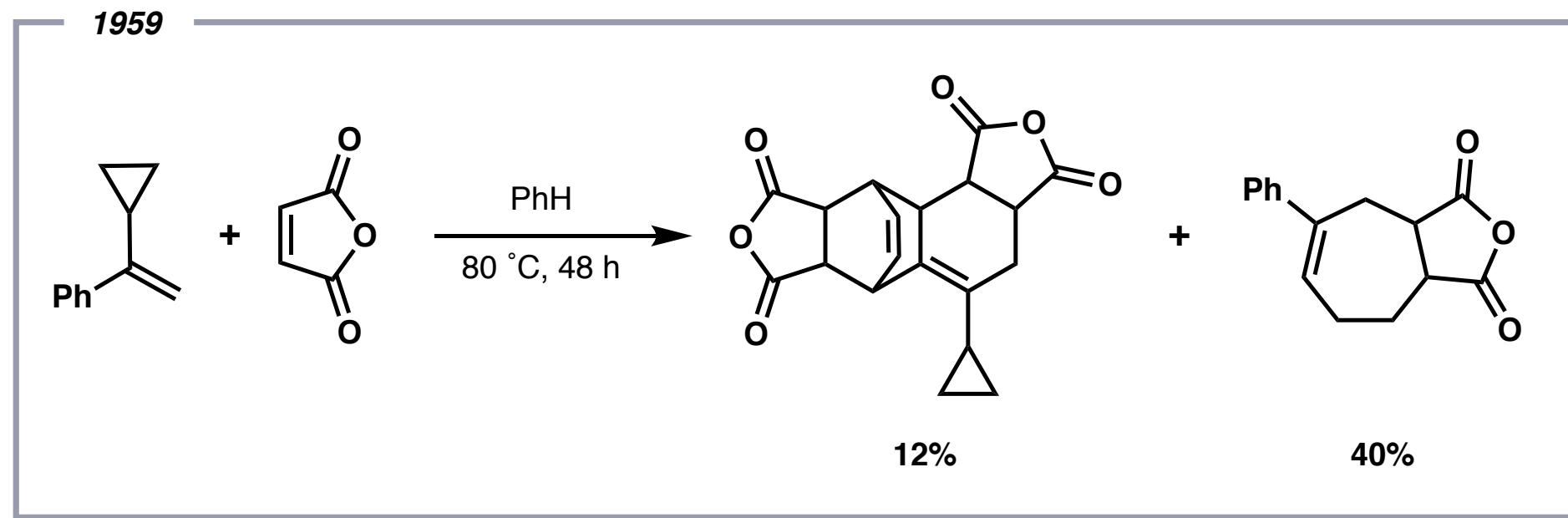
(5 + 2) Cycloadditions



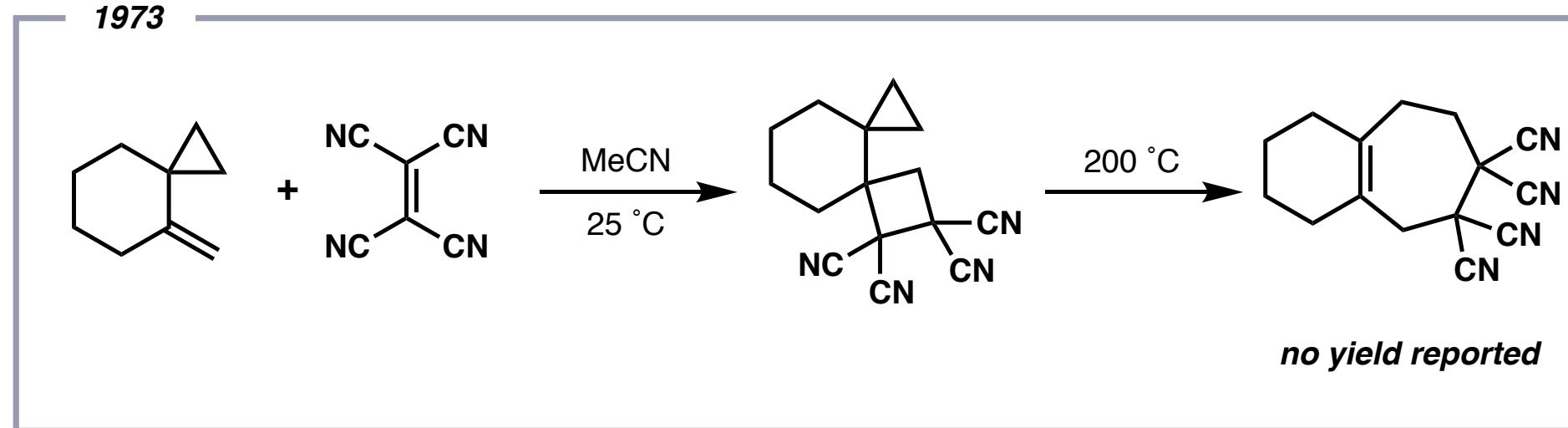
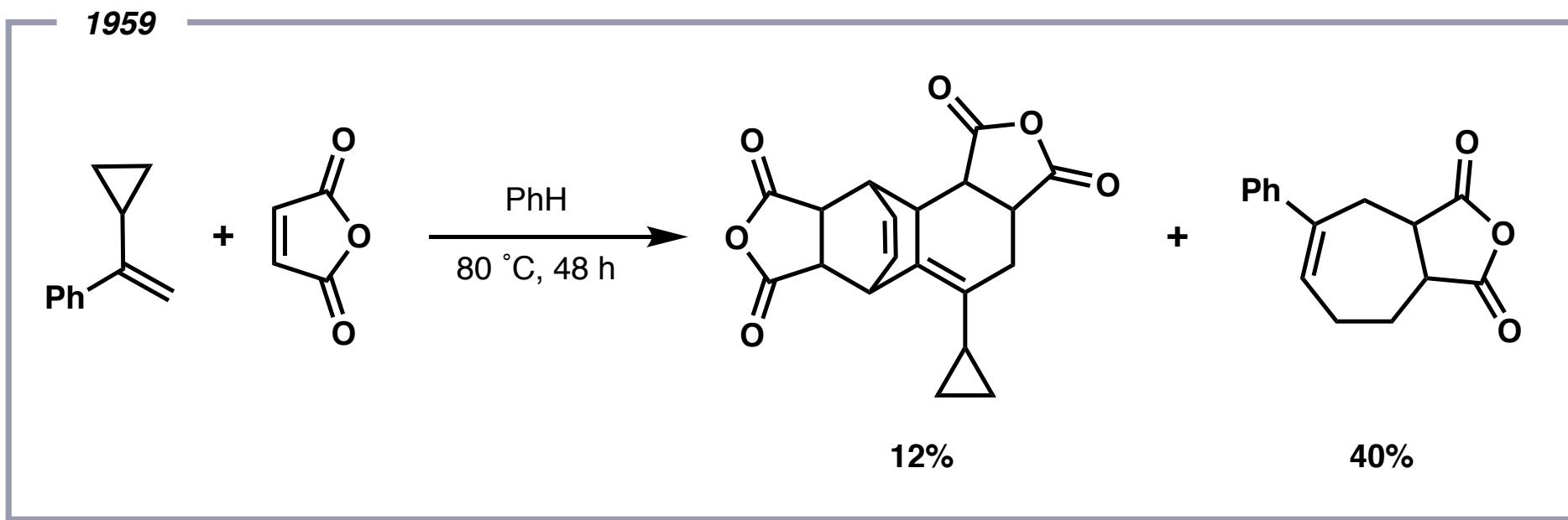
(5 + 2) Cycloadditions



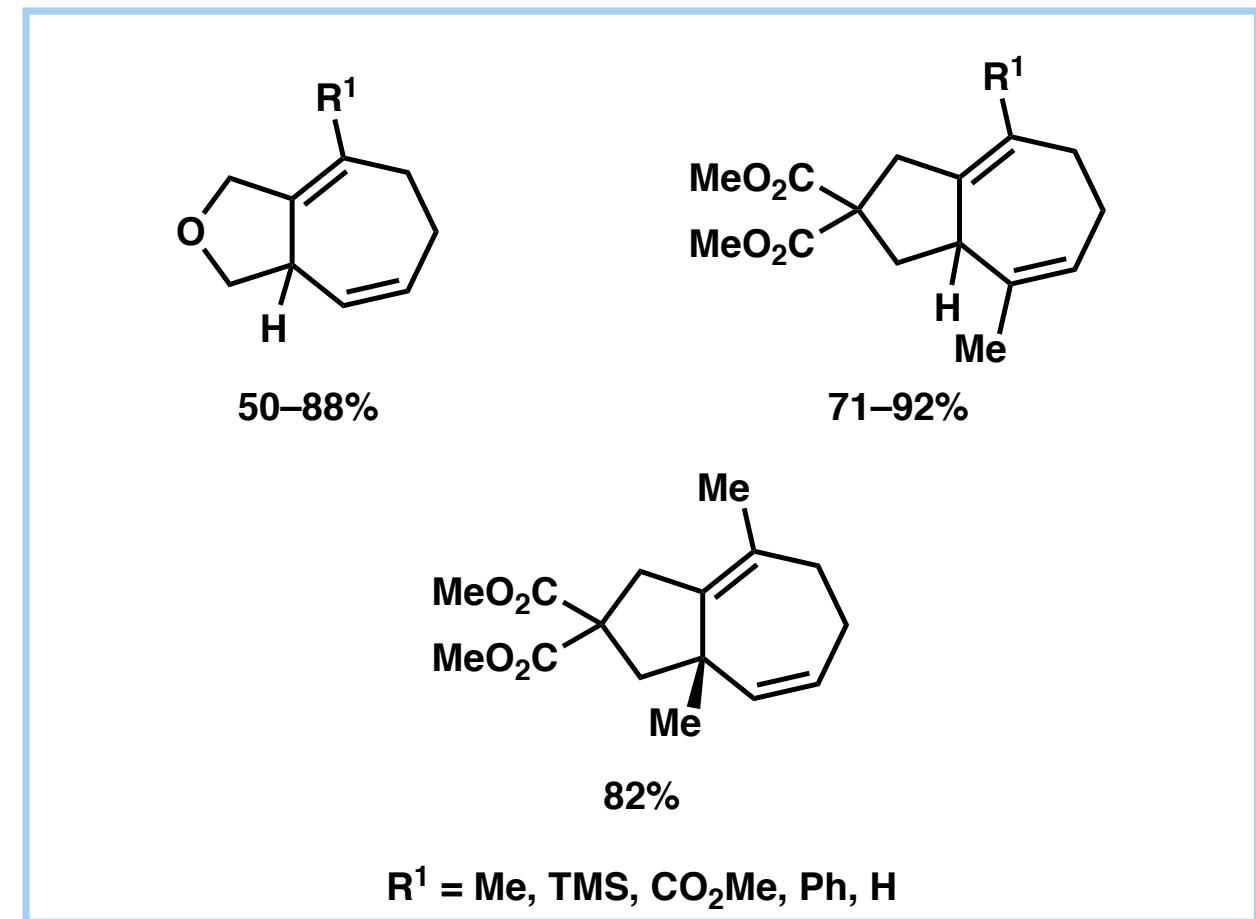
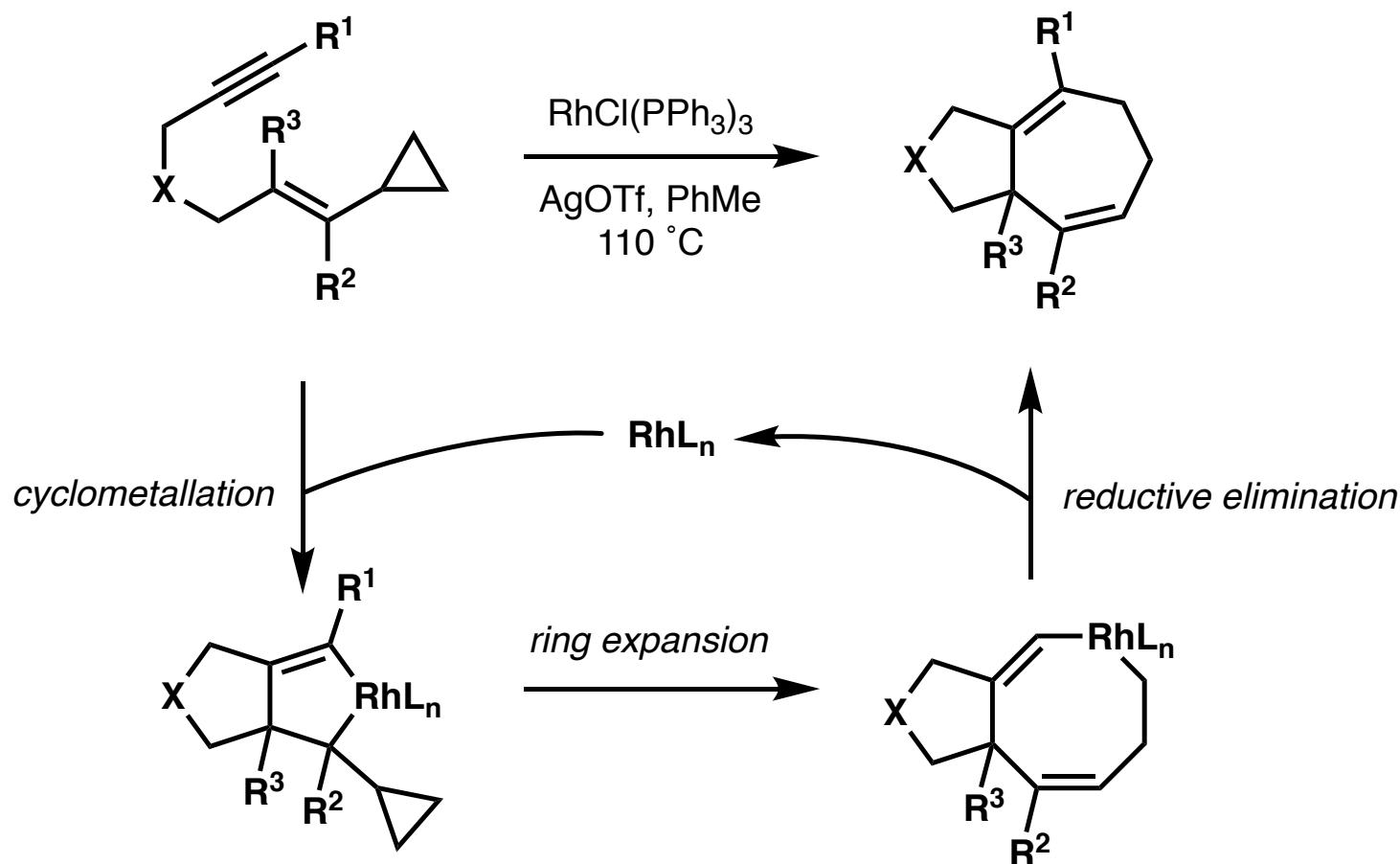
Early Vinylcyclopropane Cycloadditions



Early Vinylcyclopropane Cycloadditions



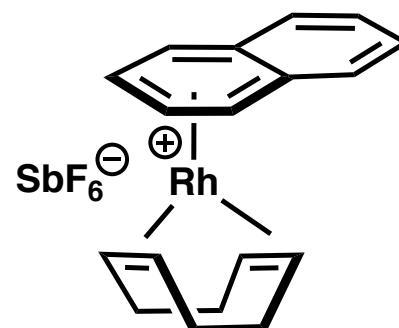
Intramolecular Reactions



Catalyst Selection

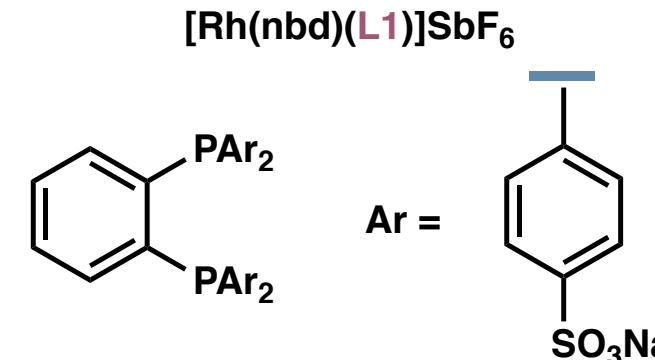
- $[\text{Rh}(\text{CO})_2\text{Cl}]_2$ and $[\text{Rh}(\text{dppb})\text{Cl}]_2$ quickly replaced Wilkinson's catalyst

2002



- lower reaction times ■ higher yields

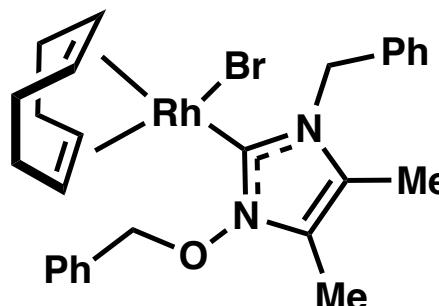
2003



L1

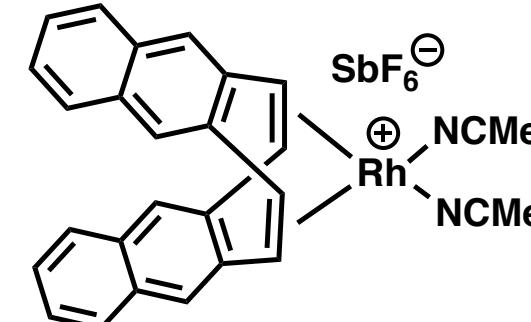
- water soluble

2007



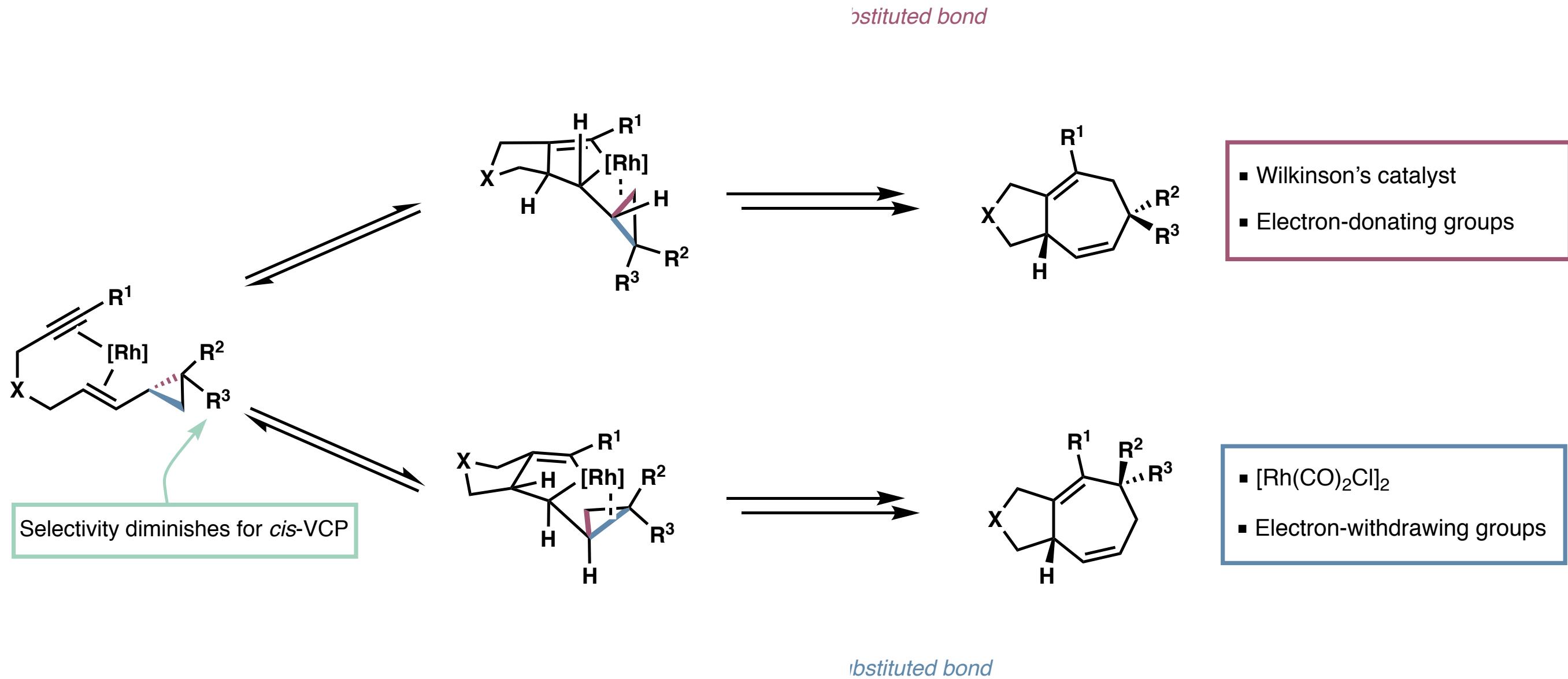
- higher activity ■ modular

2012



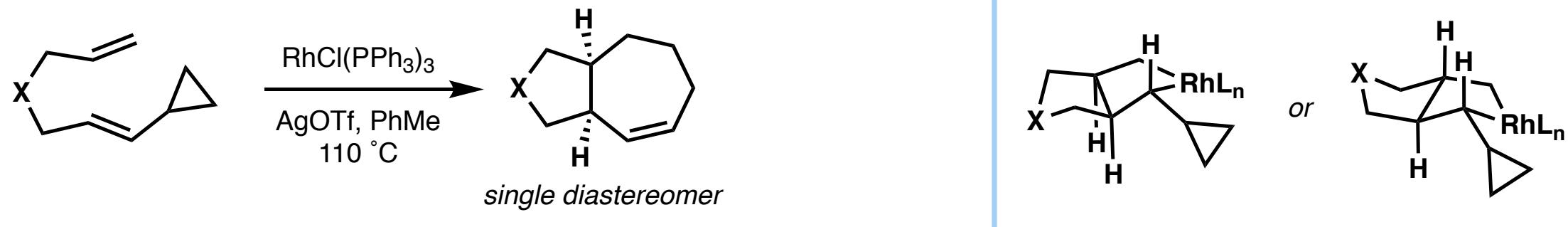
- lower reaction times ■ enhanced selectivity

Regioselectivity of Insertion

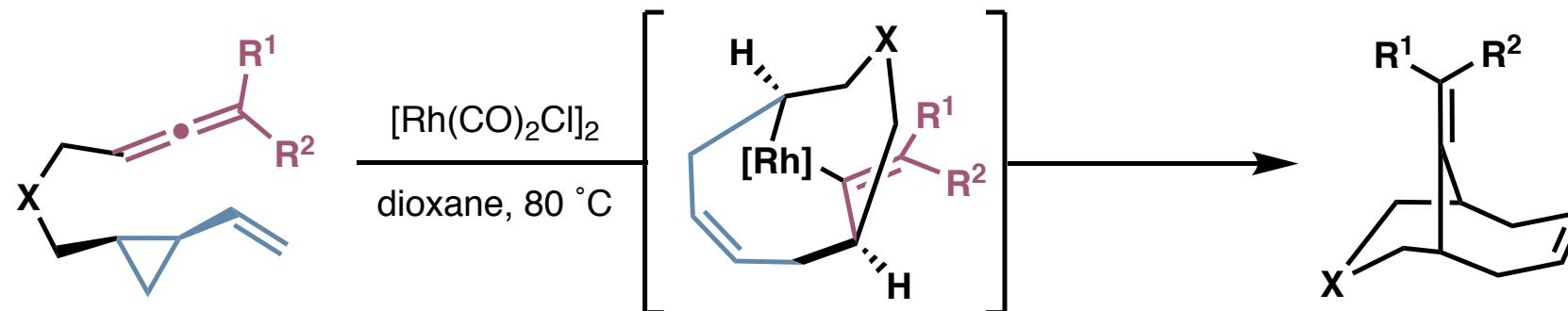


Diastereoselectivity of Cycloadditions

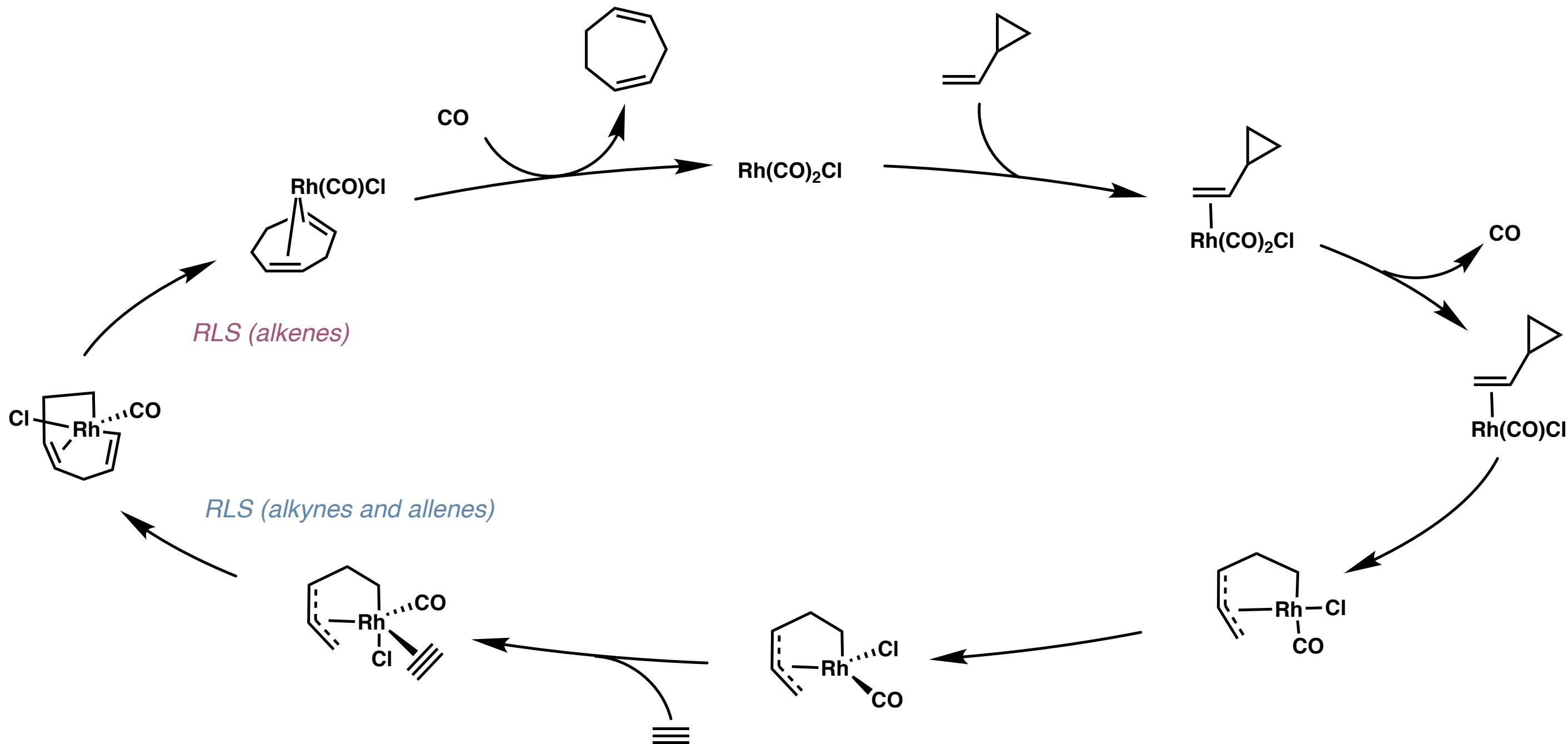
Alkenes



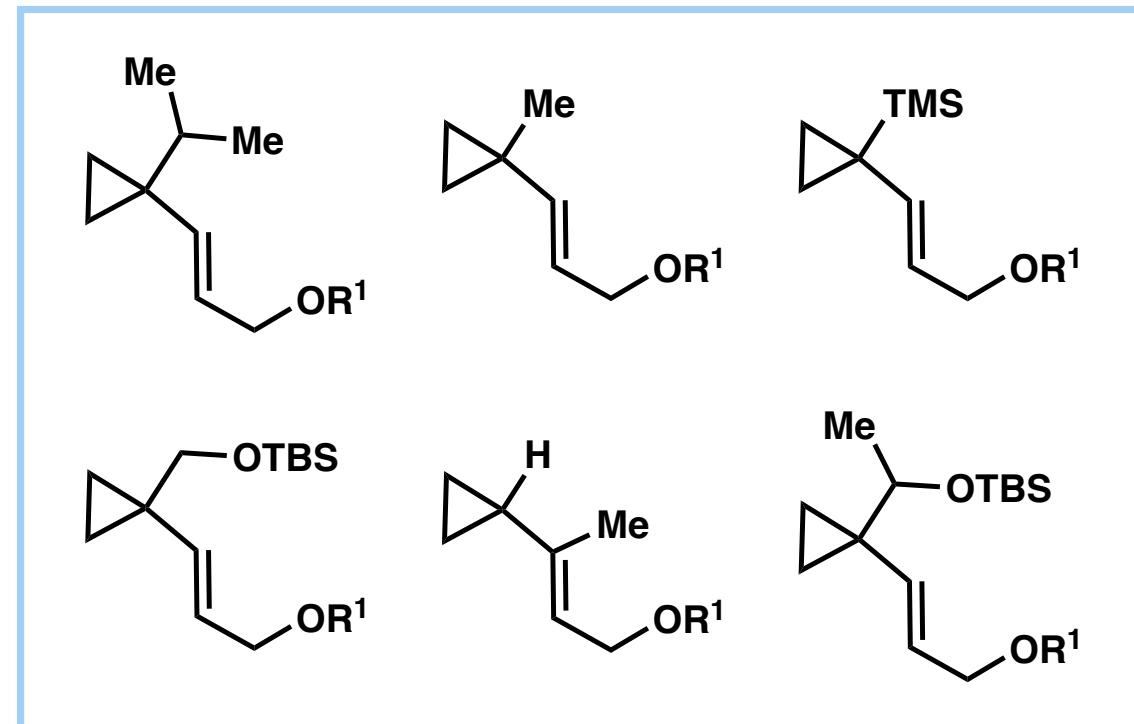
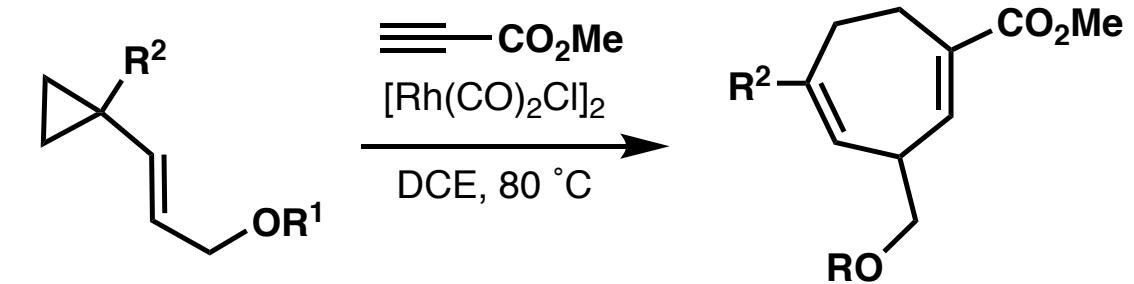
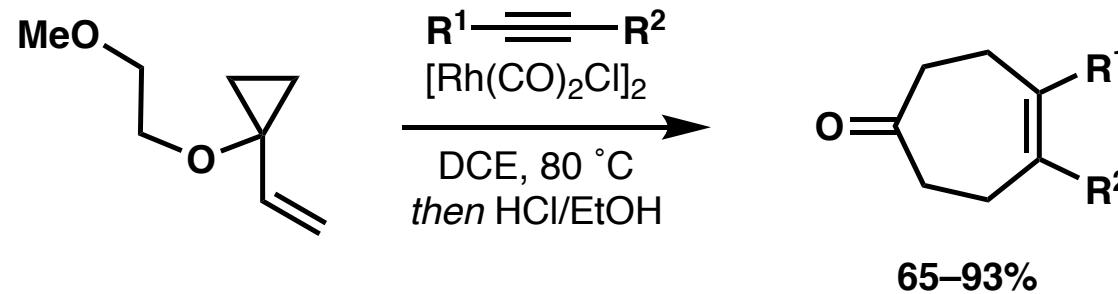
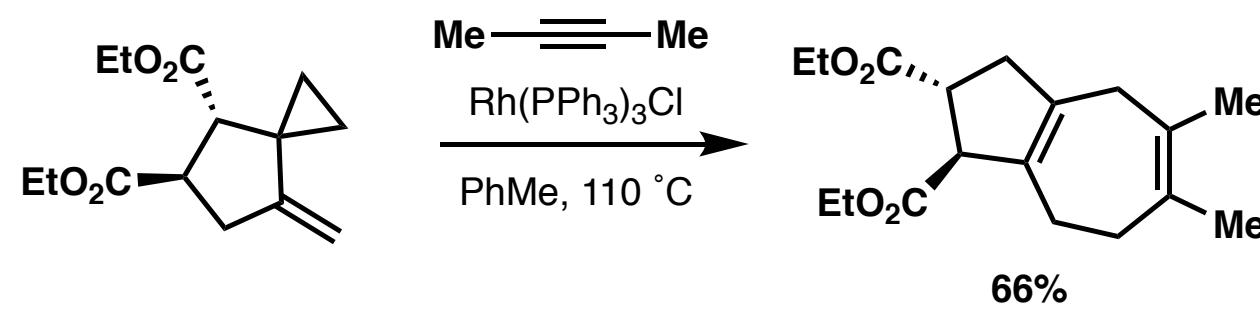
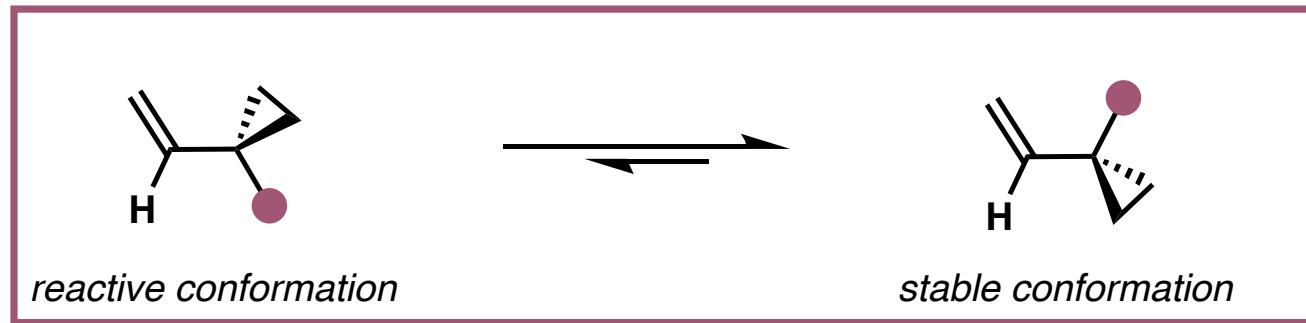
Allenes



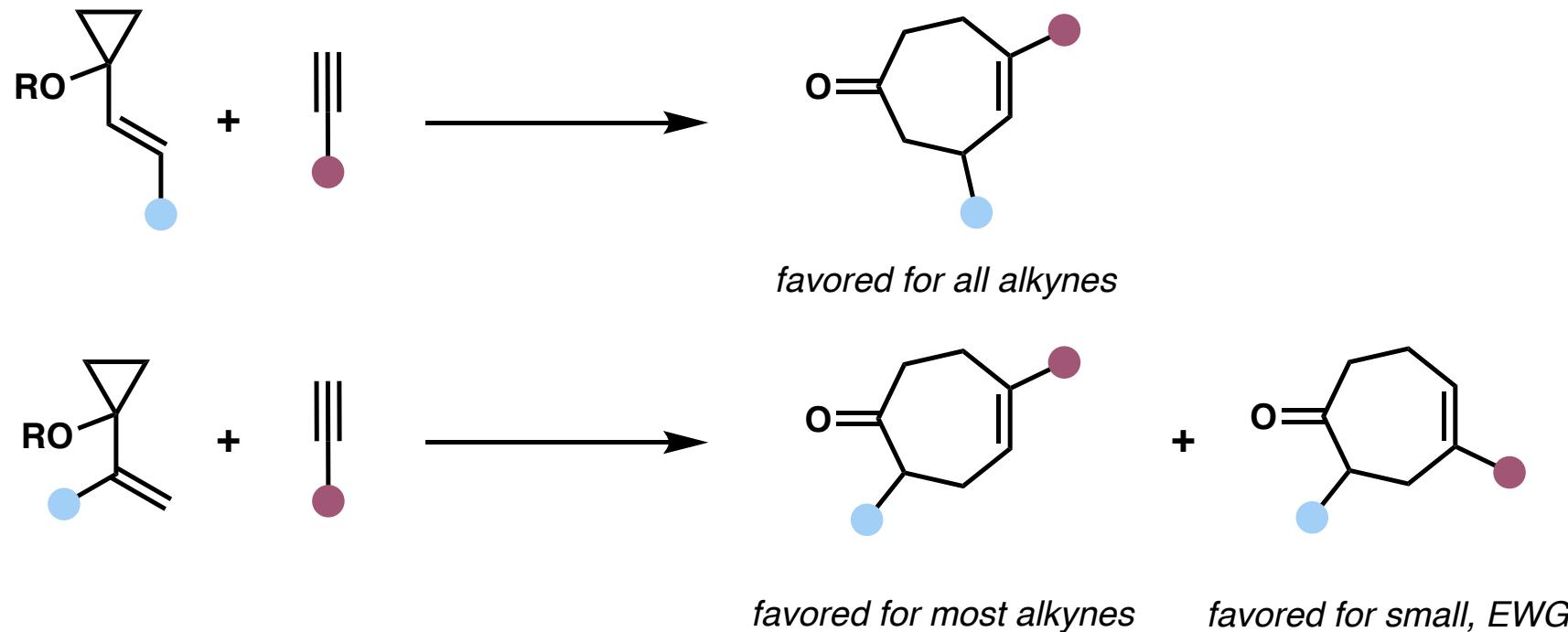
Mechanism



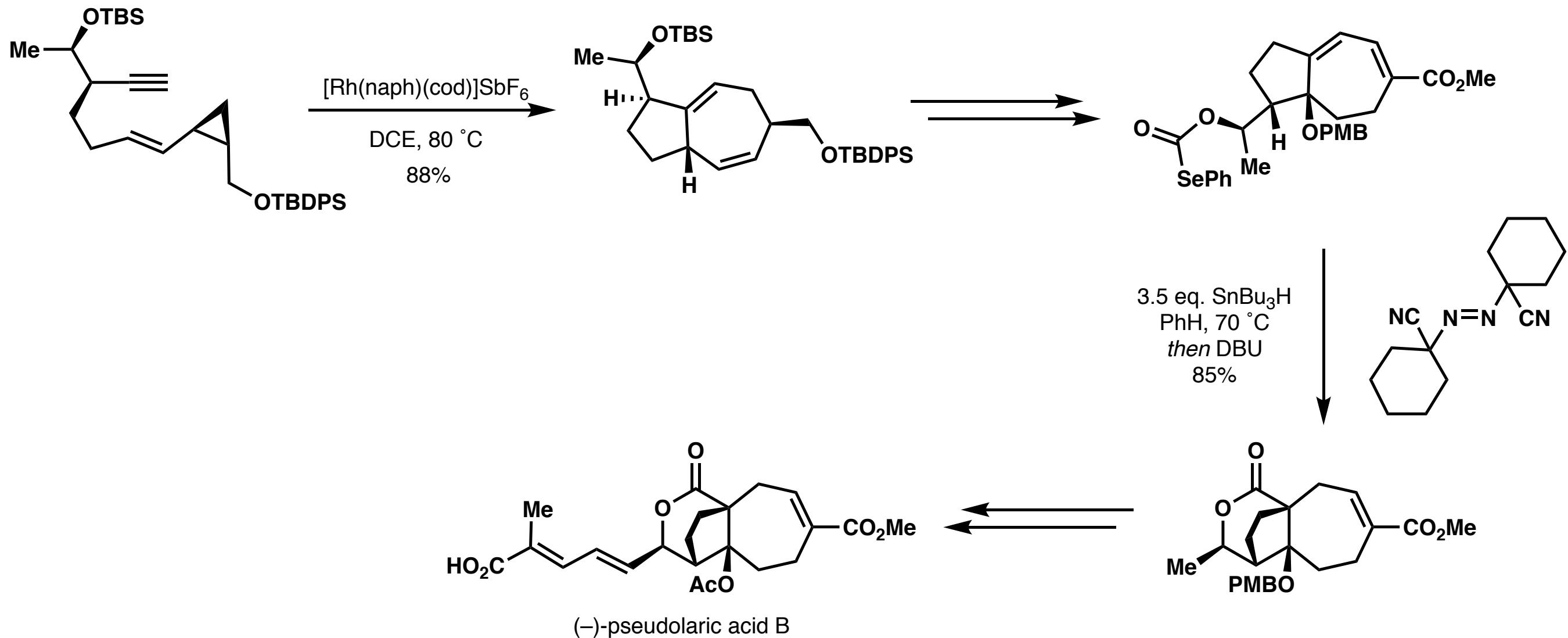
Intermolecular Variants



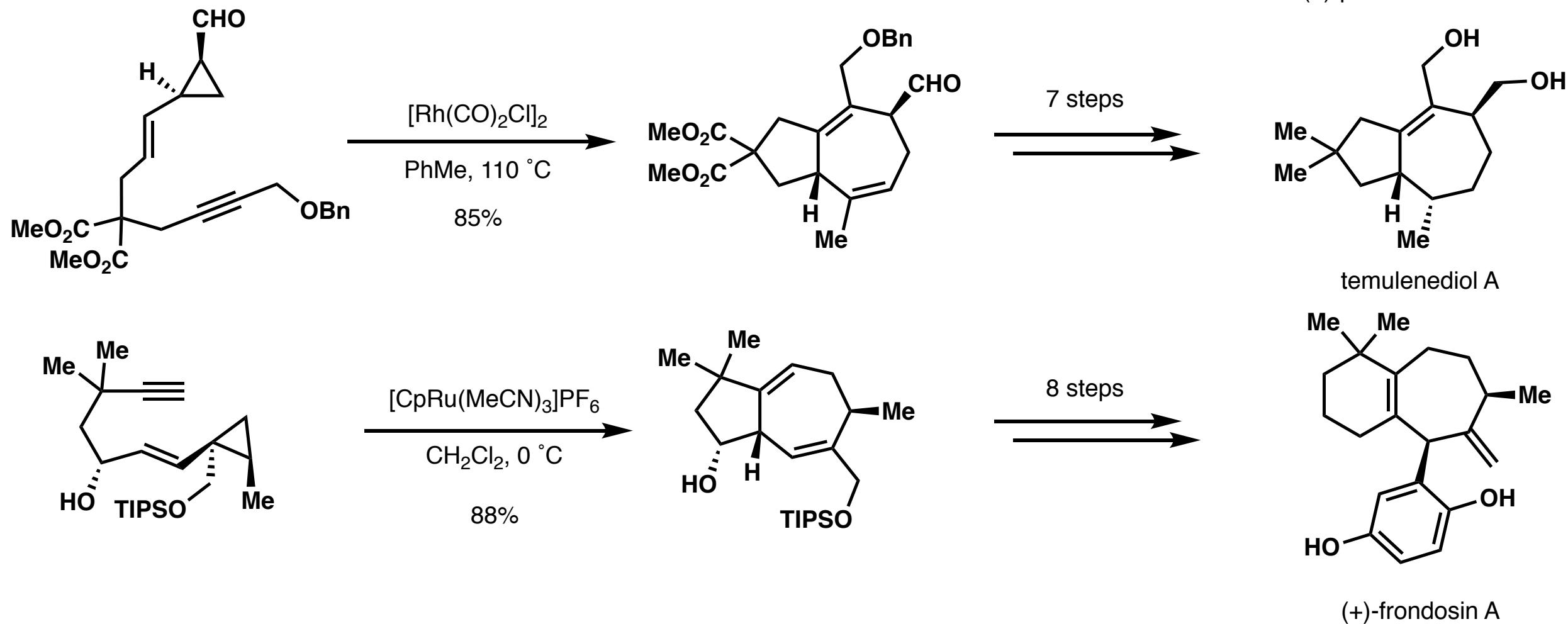
Intermolecular Variants – Regioselectivity



Synthetic Applications



Synthetic Applications



Thank you!