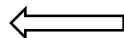
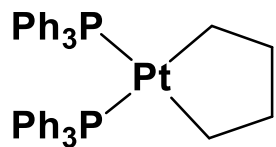
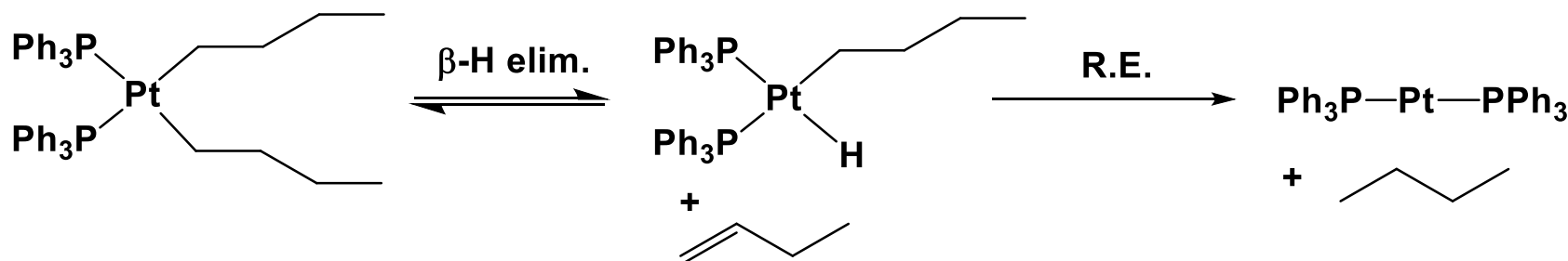


# 1,2-Insertion / Deinsertion

- 1,2-Insertion occurs *via* a planar 4-centered transition state in which the  $\beta$ -C-H bond and the M-C bond must be approximately coplanar.

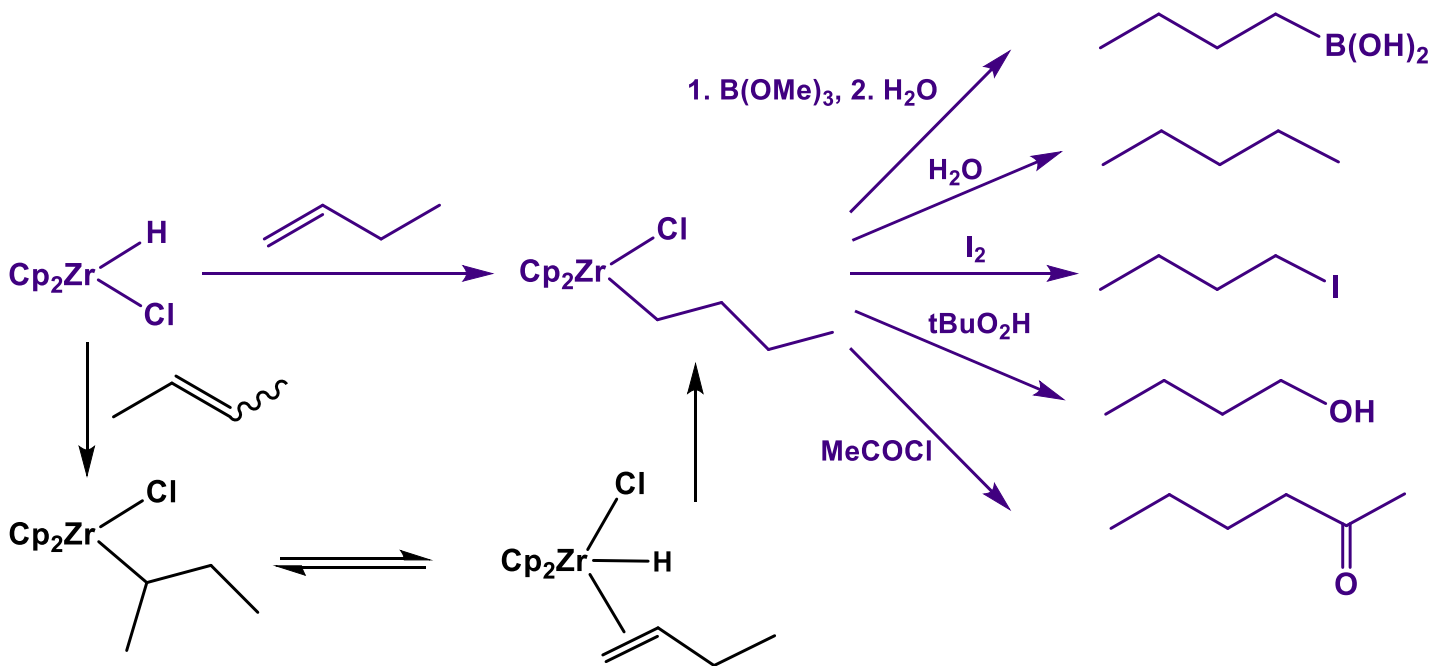


Kinetically  $10^4$  times more stable to decomposition than the dibutyl complex (difficult for the  $\beta$ -C-H bonds to become coplanar with M-C)

- How do we know that  $\beta$ -H elimination occurs through a 4-centered transition state? → a good example of the use of stereochemical probes to understand reaction mechanisms (beyond the scope of this course).

# Hydrozirconation

- Very useful stoichiometric 1,2-insertion reaction



- SYN-addition of Zr–H across a C=C or C≡C bond
- Generally, Zr attached to the least sterically hindered position (anti-Markovnikov)

