Day 6: Elementary Reactions III

TODAY'S TOPICS

- 1,1-migratory insertion
- α-elimination
- 1,2-migratory insertion
- β-elimination
- transmetallation
- C–H activation

CHEMIST OF THE DAY

name?
known for?

QUOTE OF THE DAY

"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."

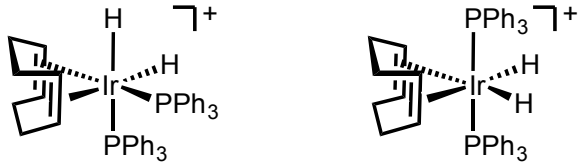
- Marie Curie

READING

Hartwig: Ch. 3.2, 8–9, 19.4
Crabtree: Ch. 7

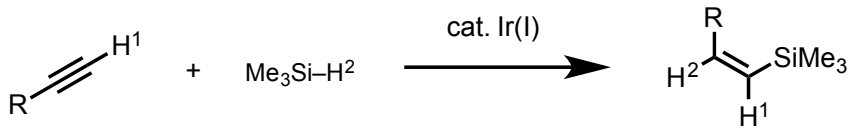
PROBLEMS OF THE DAY

#1 Complex **A** underdoes 1,2-migratory insertion with a rate that is ~40x faster than that of complex **B.** Based on general trends of 1,2-migratory insertion, **explain this observation.**

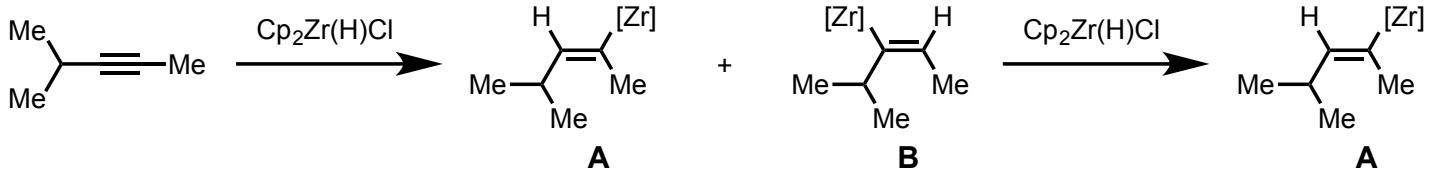


A **B**

#2 The following catalytic reaction was found to form the anti-hydrosilylated product. **Propose a reasonable that accounts for the stereochemistry of the product.**



#3 In general, hydrozirconation of unsymmetrical internal alkynes gives a kinetically controlled mixture of two regioisomeric products, with the major product being the one in which Zr is introduced to the less hindered position (**A**). Interestingly, this product mixture can be fully converted to isomer **A** by adding a second equivalent of Schwartz reagent. **Propose a mechanism to account for this observation.**



A **B** **A**

(**A:B** = 84:16)

#4 Three structurally related nickel complexes containing different numbers of phosphine ligands react via three distinct decomposition pathways. **Provide the organic product for each process and the elementary step that is associated with it.**