Day 5: Elementary Reactions II

TODAY'S TOPICS

- oxidative addition
- reductive elimination
- 1,1-migratory insertion

CHEMIST OF THE DAY

name?
known for?

QUOTE OF THE DAY

"Most scientific method stuff is oversold. Real scientists are just curious as hell."

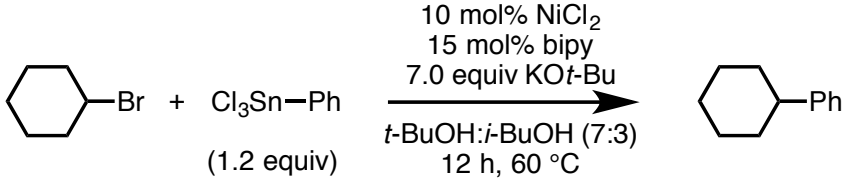
- K. Barry Sharpless

READING

Hartwig: Ch. 6–9
Crabtree: Ch. 6, 7.1–7.2

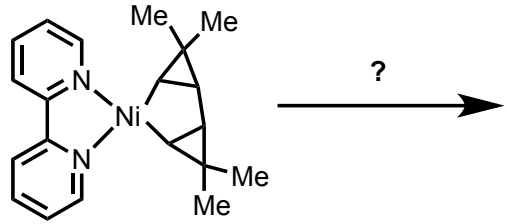
PROBLEMS OF THE DAY

#1 Consider the cross-coupling reaction below, which is proposed to involve an oxidative addition step. **Propose experiments to determine the mechanism of oxidative addition.**

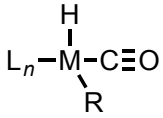


#2 The Pt(IV) complex $(Ph_3P)_2PtPh_2I_2$ only undergoes reductive elimination in methanol but not in cyclohexane. **Rationalize this outcome and provide the structure of the product.**

#3 Reductive elimination of the Ni complex below is prohibitively slow at 90 °C. **Propose a method to accelerate the rate of this reaction and provide the structure of the product.**



#4 Consider the generic transition-metal–alkyl–hydrido complex below.



A. Predict the product for CO insertion when R = alkyl and when R = H.

B. For the dihydride case (R = H), **describe situations where a different product outcome may be observed.**