Day 4: Elementary Reactions towards Catalytic Cycles II

QUOTE OF THE DAY

"Great things are not accomplished by those who yield to trends and fads and popular opinion." (Jack Kerouac)

PROBLEMS OF THE DAY

#1

Reagents? 1. ???
2. ???

Use?

Synthesis:
Mechanism of C–H cleavage:

#3

Propose experiments to determine the mechanism of oxidative addition.


#4

Propose a strategy for promoting C–N reductive elimination.


#5

Explain the observed trend.


TODAY'S TOPICS

- elementary steps
  • ligand exchange
  • oxidative addition
  • reductive elimination
  • 1,1-migratory insertion

CHEMIST OF THE DAY

Geoffrey Wilkinson (1921–1996)

Born: Springside, England
Nobel Prize (1973)
Harvard University
Imperial College London

Known for:
• Wilkinson's Catalyst (PPh₃)
• structure of ferrocene
• homogeneous catalysis

name? known for?

#2

Rh(L)(CO)₂ → Rh(L)(CO)(PPh₃)

L = indenyl Cp Cp*

k_rel = 4 x 10⁸ 1 2 x 10⁻²

Explain the observed trend.

#3

10 mol% NiCl₂
15 mol% bipy
7.0 equiv KOt-Bu
12 h, 60 °C

Propose experiments to determine the mechanism of oxidative addition.


#4

Propose a strategy for promoting C–N reductive elimination.


#5

CD₂Cl₂ or DMF
rt to 40 °C
0.5–56 h
k_obs: R = OMe > H > Cl > CF₃

Explain the observed trend.