**Mechanism of the Platinum(II)-Catalyzed Hydroamination of 4-Pentenylamines**

Christopher F. Bender, Timothy J. Brown, and Ross A. Widenhoefer

*Organometallics* **2016** *35* (2), 113-125

DOI: 10.1021/acs.organomet.5b00821

**Reading Guide**

1. Read the **Abstract** and **Introduction** on page 113. After reading these sections, you should be able to:
   1. Describe the previous research conclusions
      1. Reaction conditions
      2. Types of transition metal catalysts
      3. Limitations
   2. Compare the previous research to the current research
      1. Bender and Widenhoefer’s findings with Zeise’s dimer
      2. General alkene hydroamination mechanism
   3. Recall the goals of the current research
2. Examine Scheme 1 and Scheme 2 on page 114**.** In addition, read **Synthesis of N-Bound Platinum 4-Pentenylamine Complexes 4, Synthesis of Zwitterionic Platinamethylpyrrolidinium Complexes 5,** and **Synthesis of Bicyclic Azaplatinacyclobutane Complex 6** on pages 114-116**.** You should be able to:
   1. Briefly describe the transformation from complex **4** to **5** to **6**.
   2. Describe how the investigators characterized each complex
   3. Note the techniques used to determine the structure of each complex
3. Examine Scheme 4 on page 116. In addition, read **Stereochemistry of the Conversion of 4 to 5** on pages 116 and 117 and note equations 2 and 3 on the top left-hand corner on page 117. You should be able to:
   1. Compare the inner- and outer-sphere mechanisms
   2. Understand the difference between syn and anti addition
   3. Justify the products in Scheme 4 using the **Stereochemistry of the Conversion of 4 to 5**
      1. Note how the investigators characterized each complex
   4. Compare equations 2 and 3
      1. Note the similarities and differences
      2. Note the connection between Scheme 4 and equations 2 and 3
4. Examine Figure 4 on page 117. After reading, you should be able to:
   1. Note how the slope was determined for the Eyring plot and how this relates to the investigator’s findings
   2. Note how the intercept was determined for the Eyring plot and how this relates to the investigator’s findings
   3. Refresh your understanding of entropy of activation. Relate it to associative and dissociative mechanisms for ligand substitutions
5. Read **Kinetics of Catalytic Hydroamination** on page 120 and 121. You should be able to:
   1. Determine if a reaction is first or second order based on the rate law
   2. Note which ion the reaction is dependent on
6. Examine Scheme 10 on page 121**.** You should be able to explain every step of the catalytic cycle. Pay attention to:
   1. Overall charge on the complex
   2. Bonds forming and bonds breaking
   3. Rate determining steps
7. Read **Mechanism of Catalytic Hydroamination** and **Conclusions** on pages 121 and 122 respectively.
   1. Note the turnover limiting step
   2. Note limitations to this mechanism