Chapter 9

Understanding Strategies for Stabilizing a Carbanion

(Illustrated by keto-enol tautomerization and Diels-Alder reactions.)

Key Concepts

As you might expect, the strategies for temporarily stabilizing an electron-rich carbANION are the opposite of those used to temporarily stabilize an electron-deficient carboCATION. The stabilization strategies for a carbANION include:

1. **MINIMIZING hyperconjugation,**
2. **using a carbon with the SMALLEST possible VALENCE ORBITAL (a carbon with sp hybridization is best since the negative charge is closest to the positively-charged nucleus),**
   and/or
3. **moving electrons AWAY FROM the electron-rich area through resonance.**

What You Need To Learn, Understand, and Apply

1. **A working knowledge of how hyperconjugation, orbital size and resonance affect carbanion stability.**
2. **A working knowledge of the conditions that result in carbanion formation.**
3. **The ability to draw resonance contributors for a carbanion/non-bonded electron pair and to assess the relative stability of each contributor.**
4. **The ability to define what keto-enol tautomerization is. Also, the ability to recognize, accurately analyze, and predict the outcome of any reaction that includes keto-enol tautomerization.**
5. **The ability to recognize, accurately analyze, and predict the product of any Diels-Alder reaction.**
6. **The skills needed to apply the material and to avoid common errors.**