MODERN ORGANIC REACTIONS

Due March 10

Most of the reactions that you learn about in organic chemistry I and II have been around for a long time. This literature homework assignment is an effort to get you to learn a little bit about a more modern organic reaction. The reactions below are named for the chemist(s) who discovered them or for the chemist(s) who made them famous. You are to choose one of the reactions (there will be a sign-up sheet outside my office—first come first served) and answer the following questions/perform the following tasks about it. All of your answers must be typed and in your own words (do not quote from an article or website). Leave space for your drawings which can be done by hand (do not put all of your drawings at the end). You will be able to find information about your reaction on the internet in general (Wikipedia could be useful) and on the American Chemical Society journals website in particular. You will have to find specific articles on the ACS website (http://pubs.acs.org/action/showPublications?display=journals). You may also choose to look up the reaction on other journal websites, but the ACS site will be easier.

1. What does the reaction do? What is significant about the reaction? For instance, is it a new way of changing a particular functional group or forming a carbon-carbon bond? Is it a novel way of controlling stereochemistry or making a ring? It will help to include a drawing.

2. What are the usual starting materials, reagents, and products? It will help to include a drawing.

3. What is scope/limitation of the reaction? For instance, does it work for a range of functional groups or is it limited to one type. Does it give a range of products or only one type?

4. IF there is a similar reaction that you have learned in class (there may not be) how does this reaction compare? Is it better, more limited, more flexible, easier, greener?

5. Give the reference, including title of the article, for the first paper published about the reaction. Be sure to use ACS format. Here’s an example: Evans, D. A.; Fitch, D. M.; Smith, T. E.; Cee, V. J. Application of Complex Aldol Reactions to the Total Synthesis of Phorboxazole B. J. Am. Chem. Soc. 2000, 122, 10033-10046. You can see the following website for ways to cite other sources in the ACS format: http://library.williams.edu/citing/styles/acs.php (note that the volume number should be italicized—that formatting does not come through on this website).

6. Give the references (including title) for two recent (2006-present) papers about the reaction. Briefly describe (including drawings) what is significant about the reaction in the paper. For instance, have the authors found a new set of reagents or conditions, have they found a way to control stereochemistry, is it a key step in a multi-step synthesis or did they discover a new mechanism?
Reaction List

a. Appel Reaction  
b. Biginelli Reaction  
c. Baeyer-Villiger Oxidation  
d. Baylis-Hillman Reaction  
e. Buchwald-Hartwig Cross Coupling  
f. Corey-Chaykovsky Reaction  
g. Grubbs Metathesis  
h. Dess-Martin Oxidation  
i. Heck Reaction  
j. Hiyama-Denmark Coupling  
k. Jacobsen Epoxidation  
l. Julia Olefination  
m. Kumada Coupling  
n. Mitsunobu Reaction  
o. Nazarov Cyclization  
p. Nef Reaction  
q. Negishi Coupling  
r. Pauson-Khand Reaction  
s. Peterson Olefination  
t. Prins Reaction  
u. Ring Opening Metathesis Polymerization  
v. Sakurai Reaction  
w. Sharpless Aminohydroxylation  
x. Sharpless Dihydroxylation  
y. Sharpless Epoxidation  
z. Sonogashira Coupling  
aa. Stille Coupling  
bb. Suzuki Coupling  
c. Swern Oxidation  
dd. Ugi Reaction  
ee. Ullman Reaction