



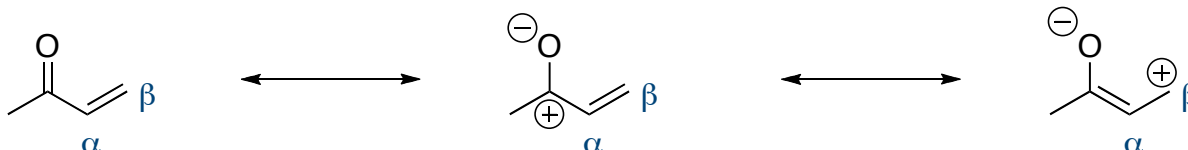
Chem 342 • Organic Chemistry II

Lecture Summary 23 - 06 Apr 2009

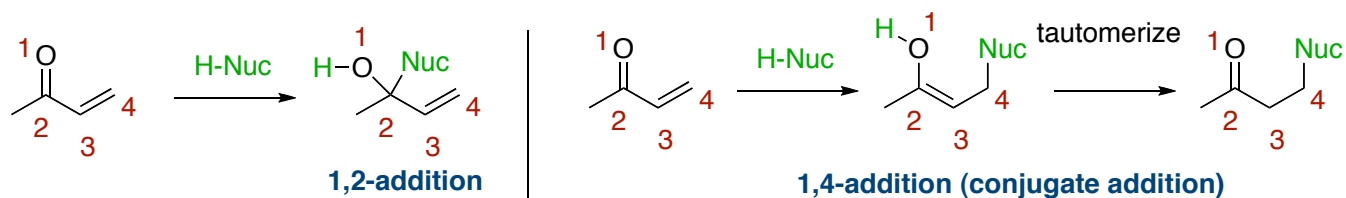
Chapter 19 - Aldehydes and Ketones: Nucleophilic Addition Reactions

α,β -Unsaturated Carbonyl Compounds

Carbonyl compounds which are conjugated with a double bond are called α,β -unsaturated carbonyls. Note from the resonance structures that there is electrophilic character (positive charge) on the carbonyl carbon AND the beta carbon.

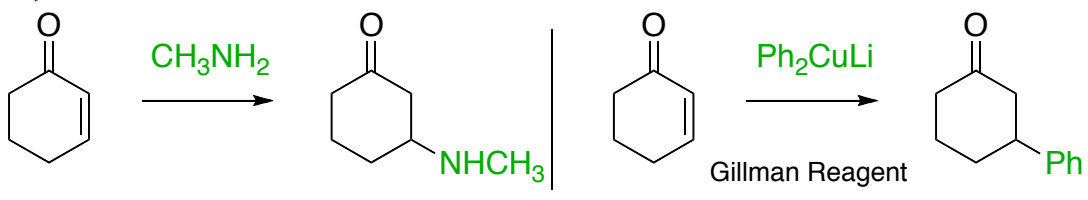


Using a generic nucleophile as an example, you can see that addition of the H^+ and $-Nuc$ can occur in a 1,2-fashion or a 1,4-fashion.

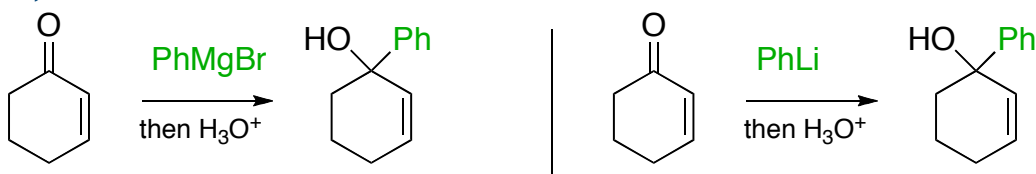


Amines and Gilman reagents are very good at generating 1,4-addition products with unsaturated carbonyls. Many other strong nucleophiles (hydride reagents, Grignard reagents, Lithium reagents) afford the 1,2-addition products selectively.

1,4-Addition



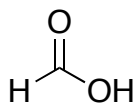
1,2-Addition



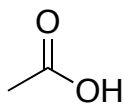
Chapter 20 - Carboxylic Acids

Carboxylic Acid Nomenclature

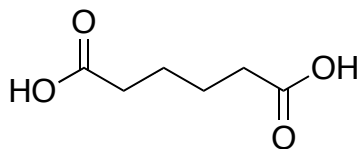
Acids are named by replacing the e with oic in the name. There are many common names for carboxylic acids that are in use. Several examples are shown below.



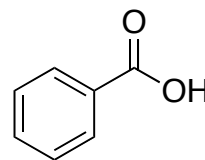
formic acid
methanoic acid



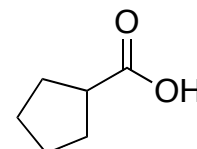
acetic acid
ethanoic acid



adipic acid
hexanedioic acid



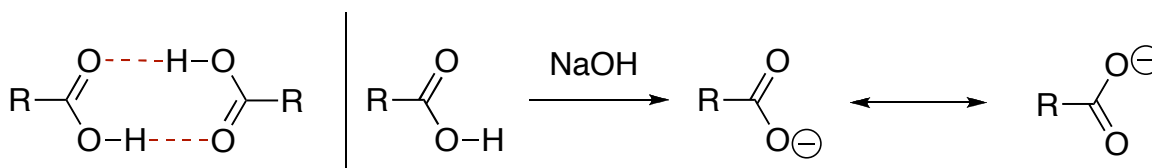
benzoic acid
benzene carboxylic acid



cyclopentane
carboxylic acid

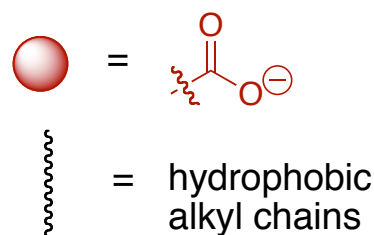
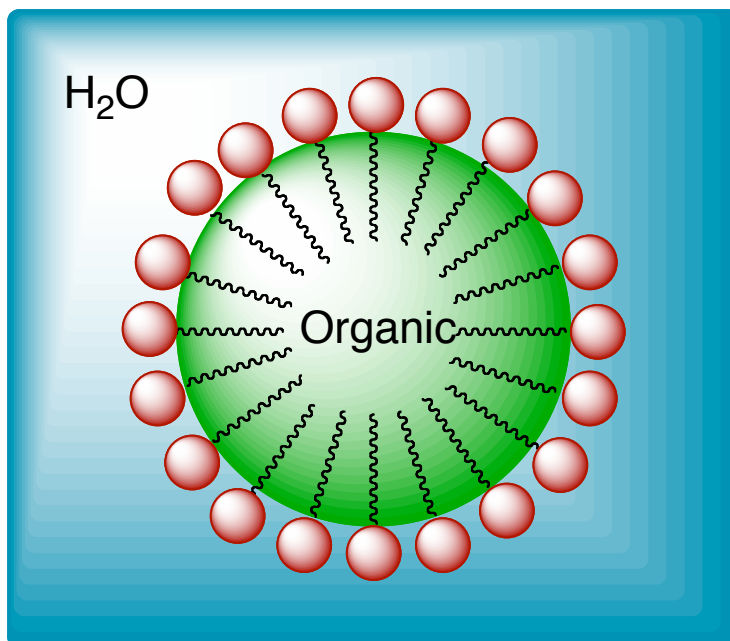
Carboxylic Acid Properties

Carboxylic acids form hydrogen bonds. As their name implies, carboxylic acids are considerably more acidic than alcohols due to the resonance stabilization of the carboxylate. Carboxylate salts of 6 carbons or less are typically quite water soluble.



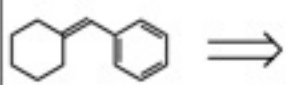
Soap is made from hydrolyzed fats, which are just carboxylate salts with long aliphatic chains. In water, they form micelles, or little balls with the polar headgroups sticking into the water phase. Inside the micelle is a very non-polar organic environment. So, grease holding dirt onto things will be dissolved into the interior of the micelles and will be washed away with water.

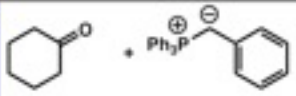
MICELLES

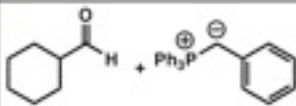


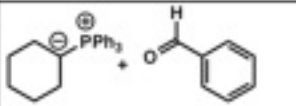
Daily Quiz

Q: Which set of phosphonium ylide and carbonyl is best to prepare the following alkene by a Wittig reaction?



1: 

2: 

3: 

4: 