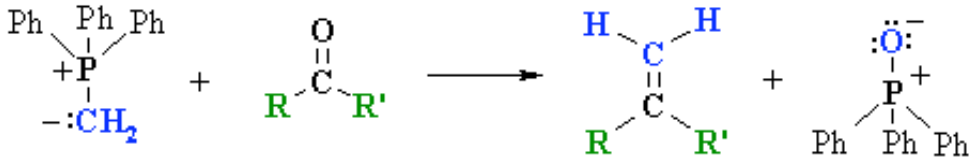
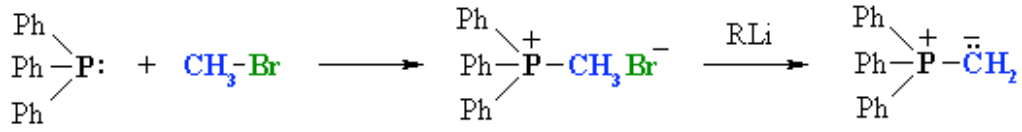
Carbonyl Chemistry: Tutorial Sheet 2

1. The Wittig reaction is an important means of forming alkenes via a nucleophilic addition of an ylid to a carbonyl group followed by elimination. The double bond forms specifically at the location of the original aldehyde or ketone.

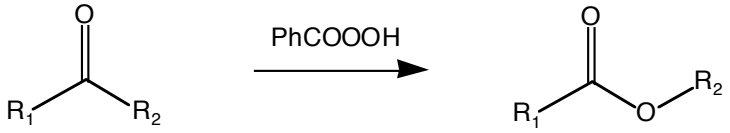


The ylid is formed in a two step process between triphenylphosphine and an alkyl halide (an S_N2 mechanism) followed by treatment with a strong base such as ann organolithium reagent.



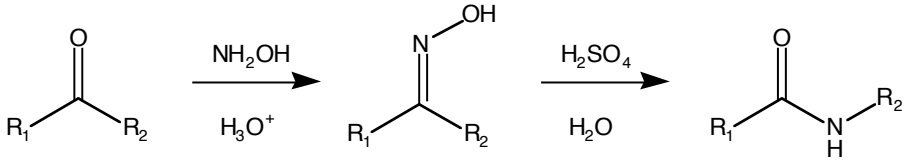
Draw the mechanism of the Wittig reaction.

2. The Baeyer-Villiger reaction is an oxidation of aldehydes and ketones that results in the insertion of an oxygen atom.



Draw the mechanism of the Baeyer-Villiger reaction. Using R_1 = Ph(H)CH_3C- and R_2 =CH_3, show how the reaction proceeds with retention of configuration.

3. The Beckmann rearrangement forms an amide from a ketone via formation of an oxime. Draw the mechanism of this reaction.



Oximes come in syn/anti pairs that react differently. Discuss the stereospecificity of the Beckmann rearrangement.