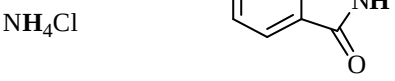
October, 14th 2010

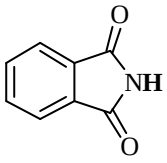
Exercice from JMJG

1. pKas

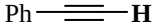
Please try first to assess the order of acidity between the protons (in bold) of all these compounds and secondly try to be more accurate and give an approximate value for each:



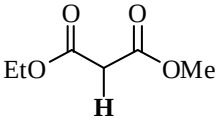
A



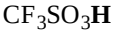
B



C



D



E

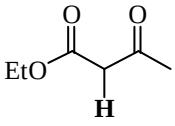
F

G

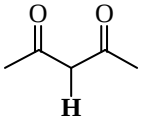
H

I

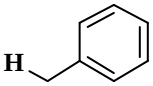
J



K



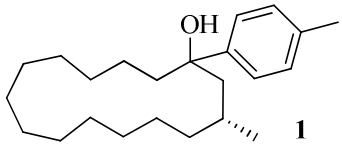
L



M

2. Sigma-Aldrich on Strike

You wanted to synthesize a Grignard reagent, which would allow you to form compound **1**.



1

Unfortunately, in your cabinet there is not a lot of bottles of organic compounds which remain: one is *p*-toluidine and the other is the ketone necessary to get this compound.

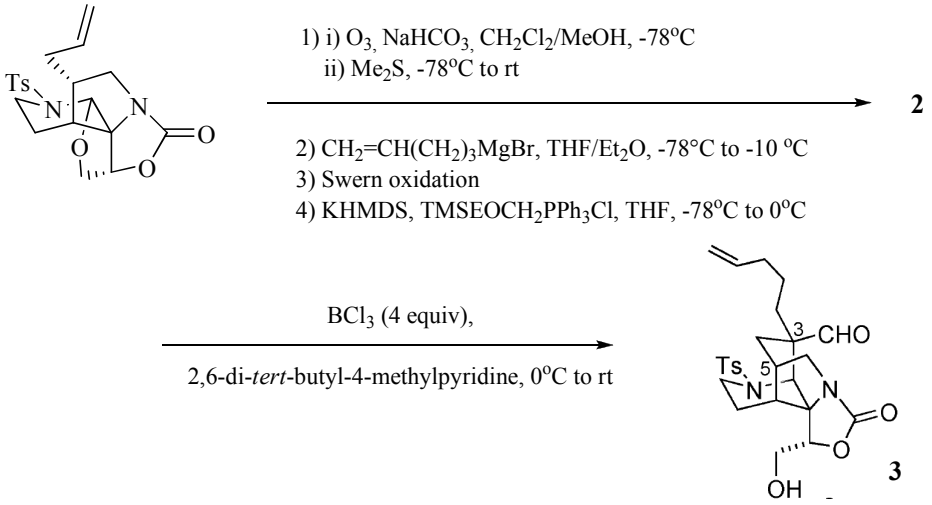
a) How would you proceed to form the necessary Grignard reagent? (You are lucky you have as many inorganic compounds and solvents as you want)
b) What is the name reaction associated?
c) What is the name of the ketone used? In which area is it used the most?

The addition of the Grignard has worked but you need to make more of **1**. Unfortunately, you used all the bottle of the necessary ketone and Sigma-Aldrich is on strike (unlimited one). A Valorpaca post doc tells you to keep cool because he has seven bottles on his shelf: (*R*)-citronellal, TBDMSCl, methylbromide, 10-bromodec-1-ene, triphenylphosphine, a solution of TBAF in THF and the Parikh-Doering reagent.

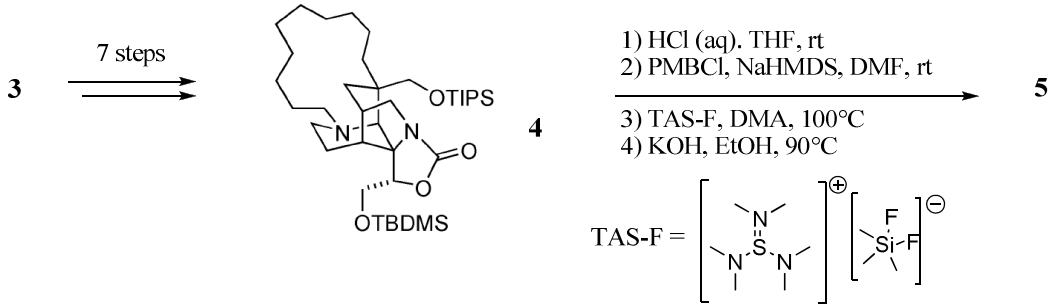
e) How would you proceed to check that this crazy messy post doc is right? You have every solvent, base, inorganic gas you need. The cabinet of common catalysts is perfectly furnished. What is the Parikh Doering reagent?

3. A Lovely Rearrangement in a Total Synthesis

a. Please could you guess the structure of **2** (mixture of two isomers)? Yes to please, give the mechanism of the first step. Do you have an idea for the mechanism of formation of **3** from **2**?



b. How would you prepare the polycycle **4** from the intermediate **3**? What is the structure of **5**?



c. Please draw the product of the first reaction. Treatment of **6** with acetic acid in CH_3CN/CH_2Cl_2 at room temperature affords the polycyclic compound **7**. Could you find a plausible mechanism for this transformation?