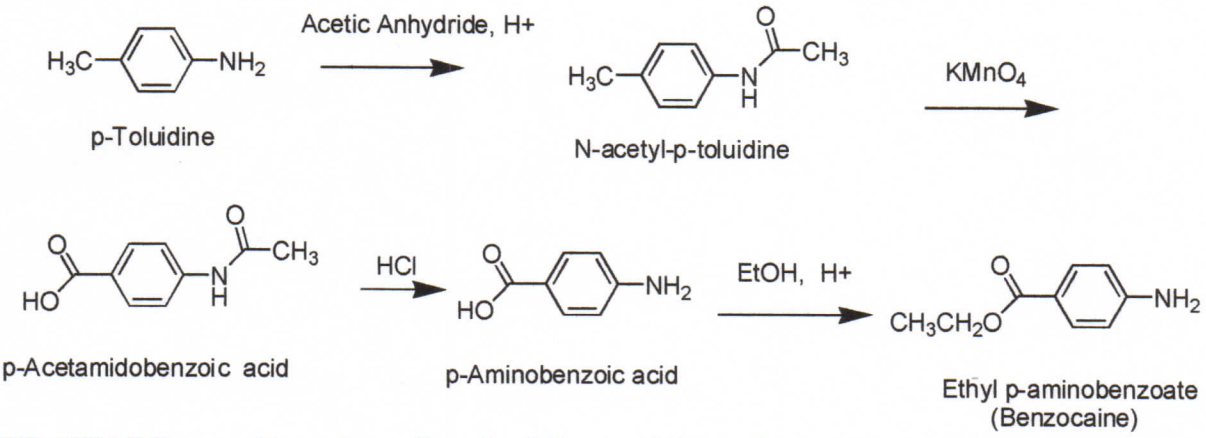
Lab 11: Multi-Step Organic Synthesis: Preparation of Benzocaine

In this experiment benzocaine, a local anesthetic that is the active ingredient in products like Oragel™, will be synthesized in four steps which are outlined below. In doing so, you will be able to practice many of the skills that you have learned this semester. The challenge will be to synthesize benzocaine in the highest possible yield. Yield is affected by a number of factors; however, in this synthesis all of the steps have the potential of nearly 100% yield. Therefore, the most important factor in obtaining good yields is the handling of compounds during isolation and purification. Besides practicing your wet chemistry skills, you will be using spectroscopic techniques to verify that the transformations have take place. This reaction sequence will allow you to practice the NMR and IR concepts that were learned in the lecture portion of Organic Chemistry. At this time you do not need to concern yourself with the mechanisms of the reactions shown below as these reactions will be discussed in detail in Organic Chemistry II.



BE AWARE you will need to collect the following information as you proceed through this lab:

p-toluidine- MP-look up
STEP 1- ~~MP~~, ~~NMR~~, ~~IR~~
STEP 2- ~~Yield~~, ~~IR~~
STEP 3- ~~Yield~~, ~~IR~~, MP
STEP 4- Yield (overall and 3→4), IR, NMR, MP
SO, be sure to save enough product to perform these analyses. Failure to **independently** perform these analyses will result in grade reduction.

Synthesis-Steps 1 and 2 (Step 1 and 2 can be performed in the same laboratory period.)

The goals of this portion of the lab include understanding the applications of protecting groups in synthesis and performing amide formation and oxidation reactions.