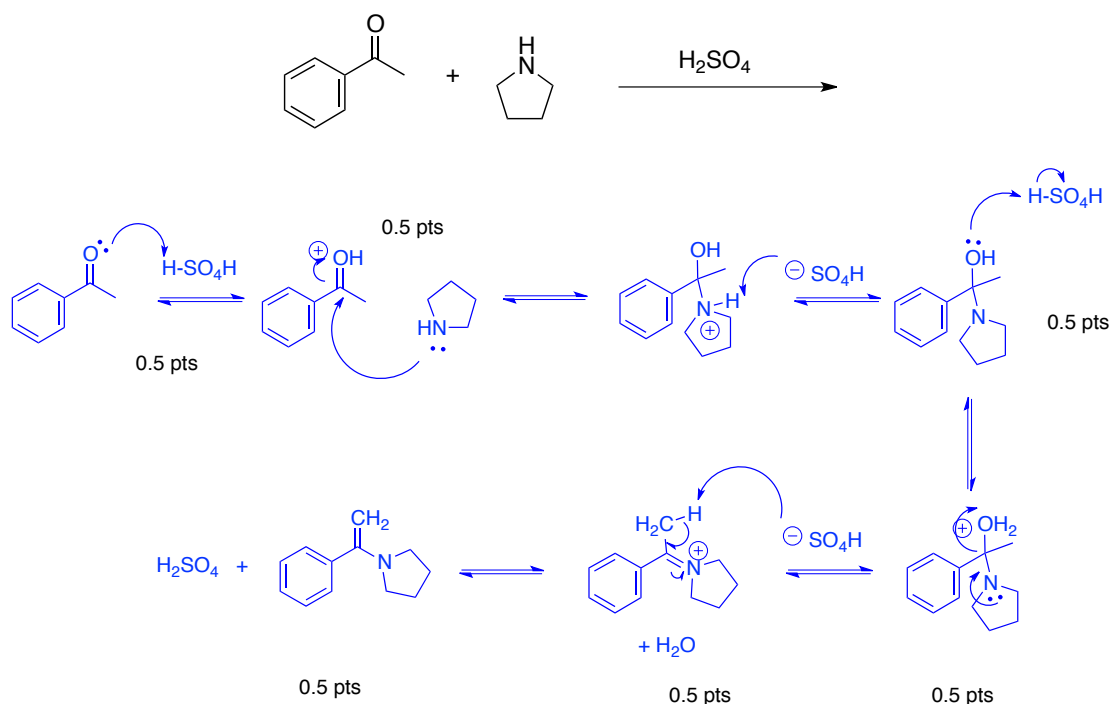


Exp 7 – Reductive Amination

Problem Set - posted November 15, 2013

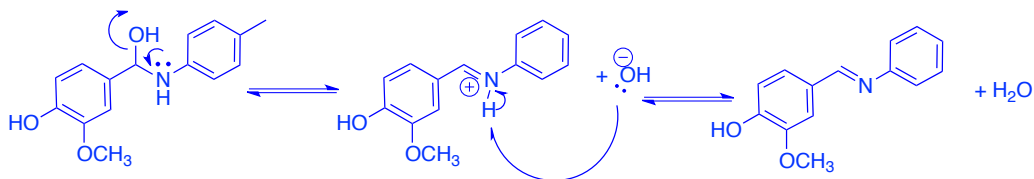
1. A secondary amine can react with a ketone to form an enamine instead of an imine. Give the mechanism for enamine formation in the following reaction. **(3 points)**



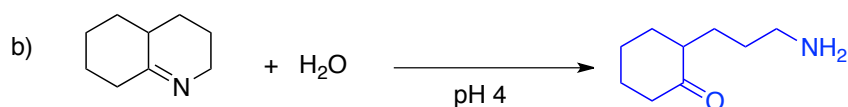
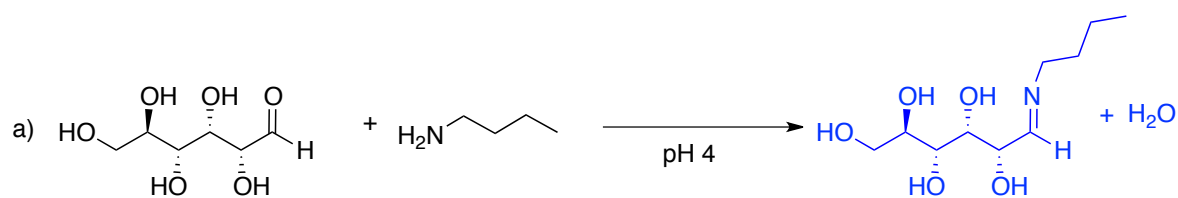
In the presence of acid, the carbonyl will be protonated

2. The synthesis of imines and enamines typically occurs under mildly acidic conditions, yet the reaction that you will perform in this experiment is successful without the need of such acid. Why? **(1 point)**

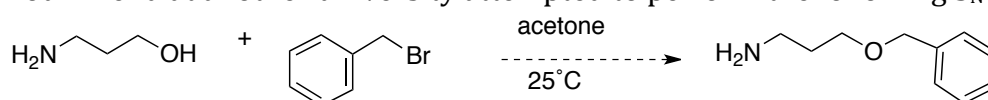
Under solventless conditions, reagents are far more concentrated and can serve as the acidic/basic environment (1 point)



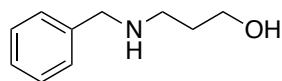
3. Provide the product(s) of the following reactions. (2 points)



4. Your friend at another university attempted to perform the following S_N2 reaction



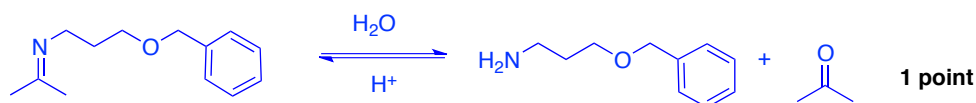
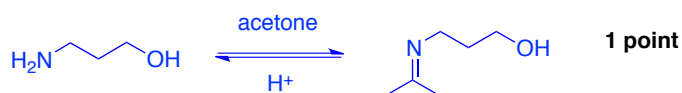
but obtained the following compound as the major product



a) Suggest a reason for the formation of this alternate product. (1 point)

An amine is more nucleophilic than an alcohol.

b) Using your knowledge of imines, propose a modification to the protocol that would allow your friend to produce the ether as the only product. (Hint: two additional steps, no mechanism needed) (3 points)



Deprotonating the primary alcohol with a strong base would work, but this does not involve imine chemistry as asked.

Any protecting group (ketone, aldehyde, acyl chloride, etc.) will suffice. Deprotecting with H_2O will also be accepted