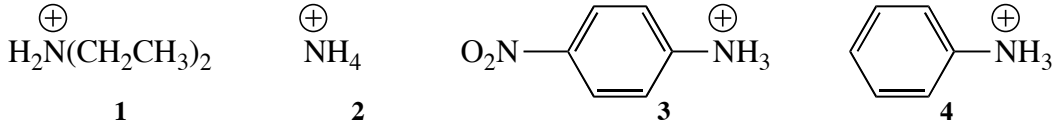
51C Practice Problems 10
Spring, 2019

1. For the following set, write in the box a single compound number that correctly completes the statement.

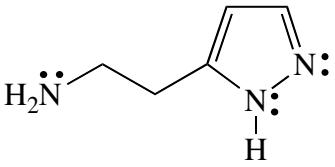


1 **2** **3** **4**

a. Which is the least acidic ammonium ion?

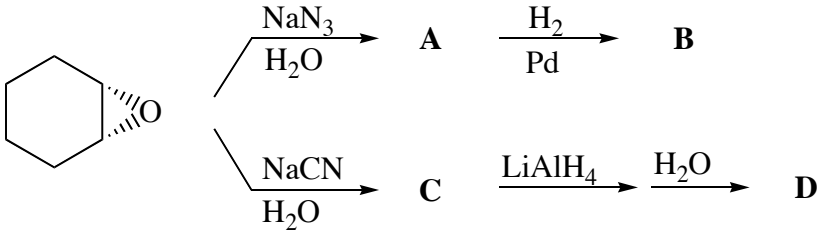
b. Which is the more acidic ammonium ion?

2. Histamine is a biologically active amine formed in many tissues. Rank the three nitrogens in histamine in order of decreasing basicity by putting a number next to each. (1 = most basic)

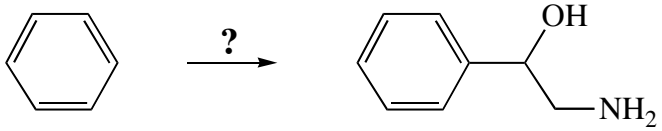


3. Provide a stepwise synthesis or products in the following reactions:

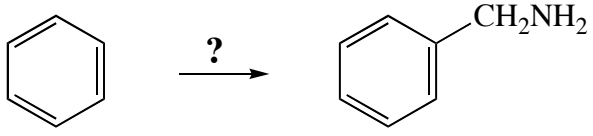
a.



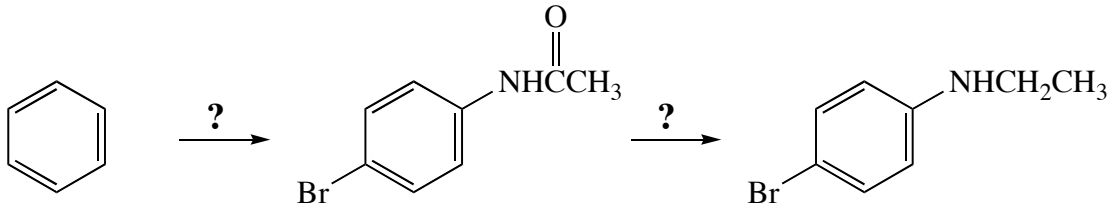
b.



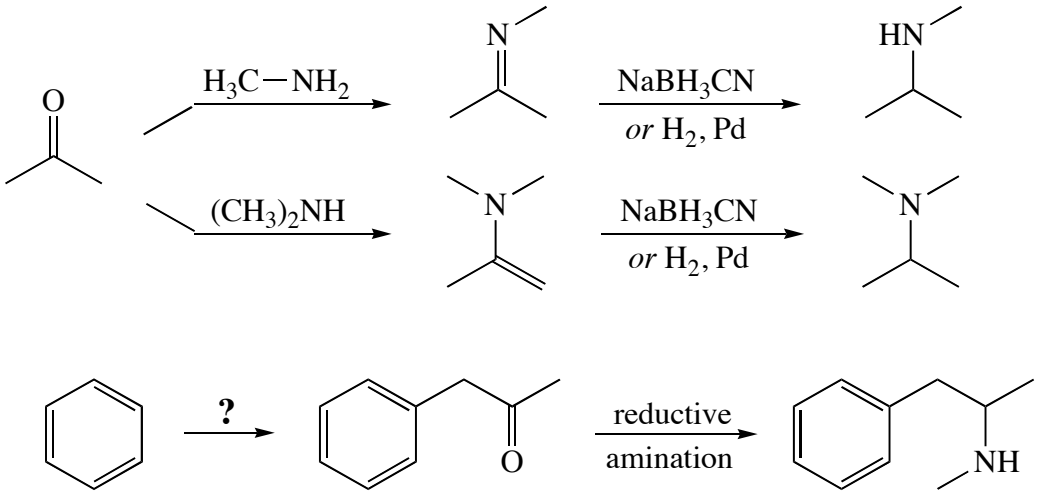
c.



d.

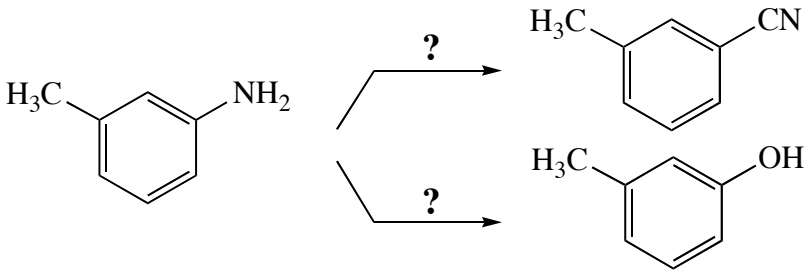


4. In a reductive amination reaction, a ketone or aldehyde reacts with a primary or secondary amine to make an imine or enamine. The imine or enamine is then reduced, using either $NaBH_3CN$ or H_2, Pd. The product is an amine. This is a widely used strategy for synthesizing amines. For the following synthesis, use a reductive amination in the final step to make a β-phenethylamine.



5. Provide a stepwise synthesis or products in the following reactions:

a.



b.