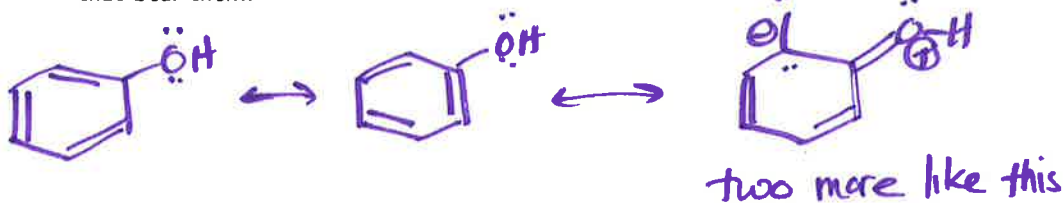
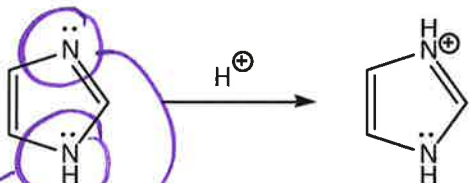


Quiz A

1. Draw three important resonance forms for phenol, PhOH. Show all lone pairs and any formal charges on the atoms that bear them.

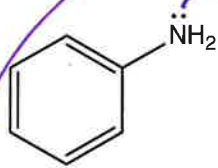


2. As we saw in class, the two nitrogens in imidazole have very different affinities for protons. The preferred reaction is shown below.



Now consider the structures of aniline and pyridine, shown below.

lone pair in 2p orb.

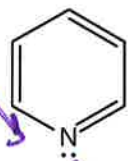


aniline

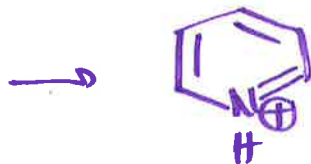


pKa of reverse rxn is ~4.6

lone pair in sp² orb

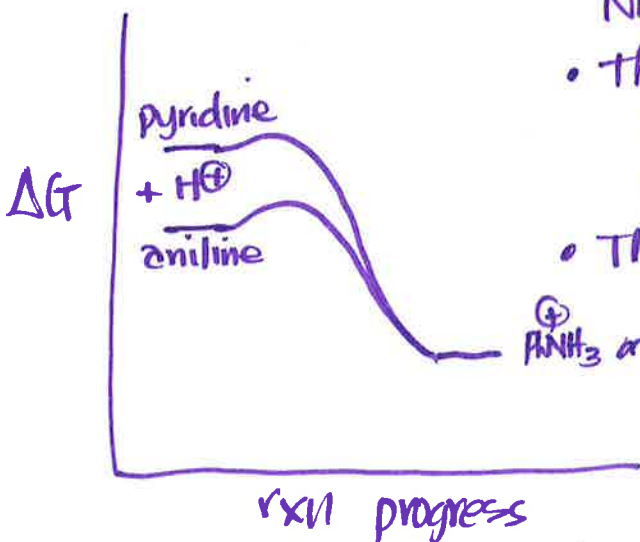


pyridine



pKa of reverse rxn is 5.14

- (a) Show each of these reacting with a proton, in the process balancing the reaction.
 (b) Show mechanistic arrows on each reaction.
 (c) Decide which compound is the better base. Then draw and label an energy diagram that compares the two reactions you wrote above, and that reflects your choice about which compound is the better base. Hint: put the conjugate acids at the same energy level, and show any energy differences on the base side of the reaction.



No explanation requested, but:

- The lone pair on aniline is involved in resonance (draw it) & not keen to be protonated
- The lone pair on pyridine is in an sp² hybrid orbital & doesn't mind being protonated
- aniline is the worst base & the best conjugate acid