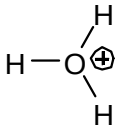
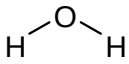
Chemistry 2331H Tuesday, September 17

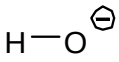
Workshop 5
Ranking Acids and Bases

1. For each of the sets of ***acids*** below, rank the molecules from 1 (most acidic) to 3 or 4 (least acidic) *without* consulting a pK_a chart. Then describe why you ranked the acids the way you did. In each case, it may help to think about the relative stability of both the acids themselves as well as their conjugate bases.

rank

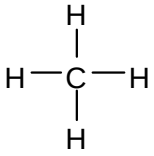


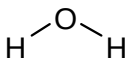


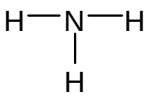


why?

rank



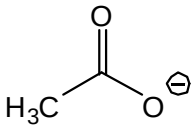


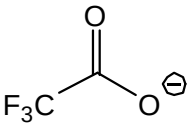


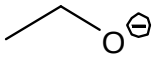
why?

2. For each of the sets of ***bases*** below, rank the molecules from 1 (most basic) to 3 (least basic) *without* consulting a pK_a chart. Then describe why you ranked the bases the way you did. Again, consider the relative stability of both the bases and their conjugate acids. In particular, think about the relative stability of charged species; which are more or less stable?

rank

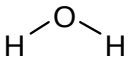


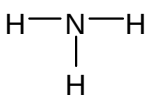




why?

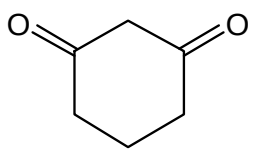
rank



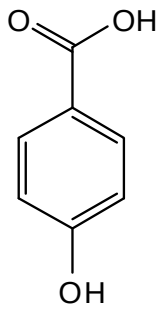


why?

3. The molecules shown below can act as ***acids*** in different ways; each has multiple protons that might be transferred to a Lewis base. Of those protons, which is most acidic, and why?

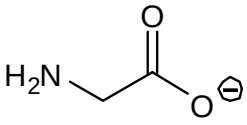


why?

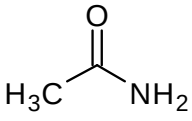


why? (hint: might be a good idea to consult a pK_a table)

4. The molecules shown below can act as ***bases*** in different ways; each has multiple electron pairs that might be donated to a Lewis acid. Of those lone pairs, which is most basic, and why?



why? (hint: might be a good idea to consult a pK_a table)



why?