

Chem 141
Problem-Set
Wednesday 27th September 2006.

1. Draw four different functional groups that contain carbon and oxygen. Use specific examples and name your examples.

2. For the following equations list the pKa (for the acids) and the role in the equilibrium; the strong acid, strong base and the weak acid, weak base. Define which side of the reaction is favored by circling.



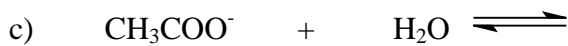
pKa

role



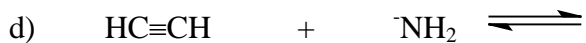
pKa

role



pKa

role

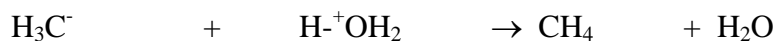


pKa

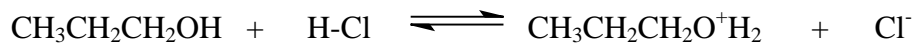
role

3) Draw in arrows to link the following structures.

a)



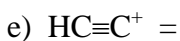
b)



4) List the following acids in order of increased acidity; 2-bromoethanoic acid, 2-chloroethanoic acid, 2-fluorethanoic acid, 2-bromoethanoic acid.

5) List the following compounds by order of increased acidity, hydrofluoric acid, nitric acid, phenol ($\text{C}_6\text{H}_5\text{OH}$), ethane (C_2H_4).

6) Define the following reagents with the terms; Lewis Acid, Lewis Base, nucleophile, electrophile, carbanion, carbocation. Use as many terms as possible to define the reagent eg. OH^- = Lewis base, nucleophile (but not carbanion).



7) Using double-headed arrows illustrate the electron motion required to generate two resonance structures of the following compound.

