CHEM 104
PLI 33
Monday, July 18, 2016 Chapter 16

1. Identify the acid (A), base (B), conjugate acid (CA), and conjugate base (CB) in each of the following reactions:

a. $HF\,(aq) + HSO_3^-\,(aq) \rightleftarrows F^-\,(aq) + H_2SO_3\,(aq)$

b. $HNO_2\,(aq) + HS^-\,(aq) \rightleftarrows NO_2^-\,(aq) + H_2S\,(aq)$

c. $PO_4^{3-}\,(aq) + HNO_3\,(aq) \rightleftarrows NO_3^-\,(aq) + HPO_4^{2-}\,(aq)$

d. $HS^-\,(aq) + H_2O\,(l) \rightleftarrows H_2S\,(aq) + OH^-\,(aq)$

e. $HF\,(aq) + HCO_3^-\,(aq) \rightleftarrows F^-\,(aq) + H_2CO_3\,(aq)$

2. Given that the K_a for acetic acid is 1.8×10^{-5}, calculate the pH of a 0.20 mol/L solution.

3. A student prepares a 0.45 M solution of a monoprotic weak acid and determines the pH to be 3.68. What is the K_a of this weak acid?

4. HF, hydrofluoric acid, is a weak acid with a K_a of 3.55×10^{-4}. What would be the pH of a solution of 1.34 M sodium fluoride? First complete the following net ionic equation:

$$F^- (aq) + H_2O (l) \Leftrightarrow$$

5. Please determine whether an aqueous solution of each of the following salts will be acidic, basic, or neutral.

   a. $KClO_4$
   b. NaCN
   c. $NH_4CH_3CO_2$
   d. ~~$AlCl_3$~~
   e. NH_4ClO
   f. K_2CO_3
   g. $CaBr_2$
   h. NaF
   i. $LiClO_4$
   j. NH_4Br

6. For the following acids, please (a) rank the acidities, (b) write the conjugate base, and (c) rank the basicities of the conjugate bases. 1=least, 6=most

	HNO_2	H_2SO_4	H_2O	H_2CO_3	NH_3	HF
(a)	_____	_____	_____	_____	_____	_____
(b)	_____	_____	_____	_____	_____	_____
(c)	_____	_____	_____	_____	_____	_____