CHM2046 Exam 3 (Acids and Bases, Aqueous Ionic Equilibrium) -Donnelly

1. Find H_3O+'s concentration in a solution that contains 5.5×10^{-5} M OH– at 25°C. Is the solution acidic, basic, or neutral?

2. Which of the following is the stronger acid?

a. HBrO vs. $HBrO_3$

b. HI vs HF

3. Define the following:

a. amphoteric-

b. triprotic-

c. common ion effect-

d. buffer-

e. pH-

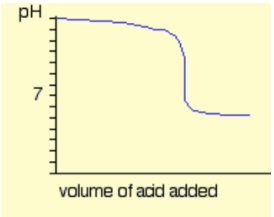
4. A 10.0 mL sample with an HCN concentration of .200 M is titrated with .0998 M NaOH. The pKa has a value of 9.31.

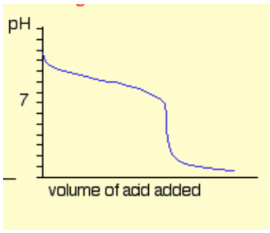
a. What is the pH at the half-neutralization point?

b. What is the pH initially?

c. What is the pH after adding 1.0 mL past the neutralization point?

5. Identify what two substances are interacting for each graph (i.e. strong/weak acid/base).





6. Label the acid, base, and their conjugates for the following equations.

a. $C_5H_5N(aq) + H_2O(l) \leftrightarrow C_5H_5NH^+(aq) + OH^-(aq)$

b. $HNO_2(aq) + H_2O(l) \leftrightarrow H_3O^+(aq) + NO_2^-(aq)$

7. Complete the table below

Soln:	Contains:
Acidic	$[H_3O^+]$__$[OH^-]$
	$[H_3O^+] < [OH^-]$
Neutral	[___] = $[OH^-]$

8. If HA is a weak acid, what is Ka?

	HA	<->	H3O+ + A-	Given: pH=4.25
I	.100M			
C				
E				

9. 5 moles of HF and 5 moles of NaF are added together to form a solution with a volume of 3.5 L. 0.5 L of 1.2 M HBr is spilled into the buffer. If the buffer is overpowered, what is the pH after this reaction? If not, what is the mass of the conjugate base afterwards? Ka=6.6E-4