Chem531
Prelab 6 (Experiment #22)

1. Stepwise equilibrium constants (K_1, K_2, K_3, etc.) describe individual steps in a sequential series of chemical reactions while overall equilibrium constants (β_1, β_2, β_3, etc) describe net chemical reactions. Given the two step equilibrium below, determine the net equilibrium and an the overall equilibrium constant.

$$A + B \rightleftharpoons AB \qquad K_1 = \frac{[AB]}{[A][B]}$$

$$AB + B \rightleftharpoons AB_2 \qquad K_2 = \frac{[AB_2]}{[AB][B]}$$

$$\_\_\_\_\_ + \_\_\_\_\_ \rightleftharpoons \_\_\_\_\_ \qquad \beta_2 =$$

2. Look carefully at equation 16 on page 225. Describe how each of the variables (A_{tot}, $[H^+]$, $[OH^-]$, and M_{tot}) can be determined.

3. Equations 18 and 19, which describe how β_1, β_2, and β_3 will be determined, all necessitate that [A-] be known. How will you determine this value?

4. As you learned in General Chemistry, pKa values can be approximated by determining the pH at the ½ equivalence point. How does this principle relate to this lab?