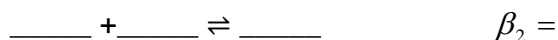


Chem531  
Prelab 6 (Experiment #22)

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 ( $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ , etc) describe net chemical reactions. Given the two step equilibrium below, determine the net equilibrium and the overall equilibrium constant.



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

3. Equations 18 and 19, which describe how  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  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  $\frac{1}{2}$  equivalence point. How does this principle relate to this lab?