

## CHEM 201 Self Quiz - 5 (Complexometry / Electrochemistry)

1. (a) Find the conditional formation constant for  $\text{Mg}(\text{EDTA})^{2-}$  at pH 9.00.  
(b) Find the concentration of free  $\text{Mg}^{2+}$  in 0.050M  $\text{Na}_2[\text{Mg}(\text{EDTA})]$  at pH 9.00

**See solution manual: p114**

2. Calculate  $\text{pCo}^{2+}$  at each of the following points in the titration of 25 mL of 0.02026 M  $\text{Co}^{2+}$  by 0.03855 M EDTA at pH 6.00:  
(a) 12 mL  
(b)  $V_e$   
(c) 14 mL

**See solution manual: p115**

3. How many milliliters of 0.050 M EDTA are required to react with 50 mL of 0.010 M  $\text{Ca}^{2+}$ ? With 50 mL of 0.010 M  $\text{Al}^{3+}$ ?

**See solution manual: p124**

4. The free energy change for the reaction  $\text{CO} + \frac{1}{2} \text{O}_2 \rightarrow \text{CO}_2$  is  $\Delta G^0 = -257 \text{ kJ}$  per mole of CO at 298K.  
(a) Find  $E^0$  for the reaction  
(b) Find the equilibrium constant for the reaction

**See solution manual: p130**

5. A 50 ml sample containing  $\text{La}^{3+}$  was treated with sodium oxalate to precipitate  $\text{La}_2(\text{C}_2\text{O}_4)_3$ , which was washed, dissolved in acid, and titrated with 18.04 mL of 0.006363M  $\text{KMnO}_4$ . Calculate the molarity of  $\text{La}^{3+}$  in the unknown.

**See solution manual: p153**