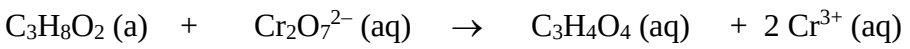
Chemistry 102 Name:_____

ELECTROCHEMISTRY
Exit Ticket

1. Treatment of gold metal with BrF_3 and KF produces Br_2 and $KAuF_4$, a salt of gold. Write a balanced equation for this reaction, and identify the oxidizing and reducing agents.

2. Balance the following redox reactions, in base, using the half-reaction method. Clearly identify each balanced half-reaction and the overall balanced equation.



$$C_3H_8O_2\,(a) + Cr_2O_7^{2-}\,(aq) \rightarrow C_3H_4O_4\,(aq) + 2\,Cr^{3+}\,(aq)$$

Balanced oxidation ½- reaction:

Balanced reduction ½-reactioni:

Balanced overall reaction:

3. Chlorine dioxide (ClO_2), used as a disinfectant for water treatment, can be produced by the reaction shown below:

$$2\ NaClO_2\ (aq) + Cl_2\ (g) \rightarrow 2\ ClO_2\ (g) + 2\ NaCl\ (aq)$$

Calculate $E°$ and $\Delta G°$ for production of ClO_2.

4. Sketch a voltaic cell based on the reaction between Cu and Mg. Identify the anode and the cathode and their identities, the half-reactions occurring at each electrode, indicate the direction of the electron flow and write an overall equation for the reaction.

5. A voltaic cell consists of a copper electrode in a solution of Cu^{2+} and a palladium electrode in a solution of Pd^{2+} ions. The copper electrode is the anode.

   a) Write a balanced equation and cell notation to represent this cell.

   b) The standard cell potential (E°_{cell}) for this cell is found to be 0.609 V. What is the reduction potential for the Pd^{2+}/Pd half-reaction?

   c) Determine the equilibrium constant for this reaction at 25°C.

   d) Consider a nonstandard cell with $[Cu^{2+}] = 3.00$ M and $[Pd^{2+}] = 0.0500$M. What is the cell voltage under these conditions?