**CHE1031 Module 5: Lecture examples**

**5.1: Galvanic cells**

**1.** A galvanic cell can be made with this reaction:

2Cr(s) + 3Cu+2(aq) 🡪 2Cr+3(aq) + 3Cu(s)

1. Write oxidation & reduction half-equations.
2. Label them as oxidation or reduction.
3. Diagram the half-cells using galvanic cell shorthand.

**2.** A galvanic cells is created using a magnesium anode immersed in a solution of acid. Hydrogen gas is produced and an inert platinum cathode is used.

1. Write oxidation & reduction half-equations.
2. Label them as oxidation and reduction. Diagram the half-cells using galvanic cell shorthand.

**3.** Consider a galvanic cells using this reaction:

5Fe+2(aq) + MnO4-1(aq) + 8H+1(aq) 🡪 5Fe+3(aq) + Mn+2(aq) + 4H2O(l)

1. Write oxidation & reduction half-equations.
2. Label them as oxidation and reduction.
3. What is the cathode? The anode?
4. Diagram the half-cells using galvanic cell shorthand.

**5.2: Standard reduction potentials**

**4.** When standard reduction potentials are known, the cell potential of a galvanic cell can be calculated rather than experimentally determined.

Calculate the cell potential of this galvanic cell:

Cu(s) | Cu+2(1 M) || Ag+1 (1 M) | Ag(s)

**5.** A galvanic cell is made with Au+3/Au and Ni+2/Ni half-cells.

1. Identify the oxidizing & reducing agents.
2. Calculate the cell potential.

**6.** A galvanic cell is made with Mg electrode in a 1 M solution of Mg(NO3)2 and a Ag electrode and a 1 M Ag(NO3) solution.

1. Identify the oxidizing & reducing agents.
2. Calculate the cell potential.