**CHE1031 Lecture 5 Take-Home Quiz Key**

**5.1: Redox agents and half-equations**

1. Identify the oxidizing agent and reducing agent in this reaction:

I2O5 + 5CO 🡪 I2 + 5CO2

1. A self-igniting rocket fuel can be produced by mixing hydrazine (N2H4) and dinitrogen tetroxide. The reaction produces nitrogen gas and water.
2. Write a balanced chemical equation.
3. What is oxidized?
4. What is reduced?
5. What is the reducing agent?
6. Solve this redox reaction using half-equations in an acidic aqueous solutions:

As2O3 + NO3-1 🡪 H3AsO4 + N2O3

**5.2: Voltaic cells are redox equations**

1. A voltaic cell is constructed using this overall reaction:

Fe + 2Ag+1 🡪 Fe+2 + 2Ag

* 1. Write the half-reaction that occurs at the anode.

* 1. Write the half-reaction that happens at the cathode.

* 1. Do electrons flow from the silver electrode or from the iron electrode?

* 1. Do cations flow from the silver electrode or from the iron electrode?

* 1. Use Appendix E to determine the Ecell value of this battery.

**5.3: Batteries**

1. Use standard reduction potentials in Appendix E, calculate the standard emf for these reactions:
   1. Cl2 + 2I-1 🡪 2Cl-1 + I2
   2. 2Al+3 + 3Ca 🡪 2Al + 3Ca+2

6. What is (are) the major difference(s) between traditional batteries and fuel cells?

**5.4: Corrosion & electrolysis**

7. Steel and copper pipe should never be placed in direct contact with one another because of danger of corrosion. Use the activity series and / or Appendix E to suggest what spontaneous chemical reaction could cause corrosion caused by contact of these two metals.

8. Miners extract gold from ore with aqueous solutions of sodium cyanide to create a soluble gold ion by redox:

4Au + 8NaCN + 2H20 + O2 🡪 4Na(Au(CN2)) + 4NaOH

1. What is oxidized?
2. What is reduced?
3. Gold miners react the soluble extract with Zn dust to harvest gold metal. What is oxidized and reduced in that reaction?