# Chapter 18 Open Notes Quiz

*You may use your hand-written notes for this quiz. You will have 20 minutes to complete this quiz. Each question is worth 2 points for a total of 20 points. (AKA you have a two point buffer)*

1. What are the last two elements you should balance for oxidation-reduction reactions in acidic/basic solutions? What are the particles you need to add to balance each of these last two elements?

Element: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 Balanced by using: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Element: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 Balanced by using: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When oxidizing and reducing agents of a redox reaction are present in the same solution, no useful work is obtained and energy is released as heat. How can we harness energy within a galvanic cell?
2. What are **2** devices that allow **ions** to flow in a galvanic cell?
3. In terms of energy, what is the purpose for making sure that **ions** flow from the cathode to the anode?
4. Why is platinum used as an electrode?
5. Given a redox reaction, how can you determine the direction of electron flow within a cell?
6. When does a battery “die” or stop working?
7. Give two examples of galvanic cells commonly used in life.
8. In terms of reduction potentials, why do metals corrode?
9. What are 2 differences between galvanic and electrolytic cells (describe both cells)?
10. What is (electro)plating?

Answers

1. oxygen 🡪 H2O, hydrogen 🡪 H+
2. separate the oxidizing agent from the reducing agent and require the electron transfer to occur through a wire
3. salt bridge and a porous disk
4. to keep the net charge at zero in each compartment of the system, because a charge separation would require a large amount of energy
5. Platinum is used when the substances in a half-reaction is not a conducting solid.
6. Anode to the cathode (OR oxidation reaction site to reduction reaction site)
7. When the cell reaction has reached equilibrium; when the compartments all have the same free energy and delta G = 0.
8. Battery (lead storage battery, dry cell battery), fuel cell
9. Metals corrode because they oxidize easily, meaning they have standard reduction potentials less positive than that of oxygen gas
10. Electrolytic uses electrical energy to produce chemical change, is non-spontaneous, includes a salt bridge or porous disk. Galvanic cells use chemical energy to produce electrical energy, is spontaneous, does not require a salt bridge or porous disk.
11. Plating means depositing the neutral metal on the electrode by reducing metal ions in solution.