**S-87**

**Unit 11 – Electrochemistry**

1. Oxidation #’s: H = +1 (except in a hydride when it is -1) O = −2 (except in a peroxide when it is -1).
2. LEO goes GER … Oxidation always occurs at the anode in both a battery and an electrolytic cell.
3. Electrons in a battery flow from anode (−) to cathode (+).
4. Salt bridge: Cations flow to the cathode, and the anions flow to the anode.
5. While a battery is discharged, the cathode gains mass and the anode loses mass.
6. If you reverse a rxn, the sign of Eo cell changes, but if you double a reaction, Eo cell DOES NOT change!!
7. Eo cell = EoRed (GER) - EoRed (LEO) (The other way to calculate Eo cell = EoReduction + EoOxidation...but that involves reversing one of the reactions and changing the sign for EoRed)
8. E°cell for a concentration cell is zero.
9. Q for a concentration cell is always [low]/[high]
10. The half-reaction with a more (+) EoRed is the reaction that takes place at the cathode...GER.
11. When adding the two half reactions together, the electrons MUST cancel out.
12. ΔGo = −nFEo If ΔGo is (−), then Eocell is (+). Reminder: n = # of electrons transferred
13. If Q increases, then the voltage (Eocell) of the battery goes down.
14. Electroplating/Electrolysis Calculation: $grams=\frac{\left(molar mass of metal\right)\left(amps\right)\left(seconds\right)}{(moles)(F)} $… $g=\frac{(MM)(I)(t)}{nF}$

**Unit 11 – Electrochemistry**

1. a) When does hydrogen NOT have a +1 Oxidation # (besides when it is a pure element)?
b) When does oxygen NOT have a -2 oxidation number (besides when it is a pure element)?
2. What does LEO goes GER and OIL RIG and “AN OX RED CAT” stand for?
3. Electrons in a battery flow in which direction?
4. In the salt bridge, which direction do the cations ions flow? The anions?
5. While a battery is discharged, does the mass of the cathode increase or decrease? The anode?
6. If you reverse AND double a redox reaction, what happens to the magnitude AND sign of Eocell ?
7. Given the reduction potentials for the half reactions, how do you calculate Eocell?
8. What is E°cell for a concentration cell?
9. What is the value of Q for a concentration cell if Cu2+ on one side is 0.2 M, and 0.4M on the other side?
10. The half-reaction with a more (+)EoRed is the reaction that takes place at which electrode? The one with the more (-)EoRed takes place at which electrode?
11. When adding the two half reactions together, what is true about the # of electrons that are gained or lost?
12. a) If ΔGo is (−), then is Eocell positive or negative? If ΔGo (+), then is Eocell positive or negative?
b) ΔGo = −nFEo , what does ‘n’ refer to?
13. If Q increases, then does the voltage (Eocell) of the battery goes up or down? If Q decreases?
14. Electroplating/Electrolysis Calculation Shortcut: grams of metal electroplated = \_\_\_\_\_\_\_\_\_?