

Chapter 17 – Electrochemistry:

- Electrochemistry - know definition
- Redox reactions –
 - assign oxidation numbers
 - Determine who is oxidized, reduced, O.A., and R.A. in a RXN
 - Write half reactions
- Galvanic Cells – Know and be able to label or determine the following:
 - Anode (-)/cathode (+) and the oxidation/reduction half reactions
 - Total reaction equation
 - Determine direction of electron flow
 - Salt Bridge
 - o Determine flow of ions in salt bridge
 - Short-hand notation of the overall reaction
- Batteries
 - Types
 - Why they die
 - Difference between volts and lasting longer
 - Inert electrodes – what are they & what are some examples
 - Corrosion – what is it & what can be done?
- Cell potentials
 - Standard cell potential – what are the standard states?
 - o Know and be able to calculate $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{ox}} + E^{\circ}_{\text{red}}$
 - Know how to determine oxidation reaction potential from the reduction potential
 - SHE: standard hydrogen electrode – what is it?
 - Remember - Positive E°_{cell} means the reaction is product-favored
 - How does this relate to spontaneity?
 - What makes a good Oxidizing or Reducing agent? Periodic table
 - o What are the worst and the best oxidizing agents?
- E°_{cell} , K, and ΔG°
 - $\Delta G^{\circ} = -nFE^{\circ}$ - don't need to know, but do need to know how to use
 - $E = E^{\circ}_{\text{cell}} - (RT/nF) \ln K$ - don't need to know, but do need to know how to use
 - $E = E^{\circ}_{\text{cell}} - (0.0592 \text{ V}) / n \log K$ (at 25°C) - don't need to know, but do need to know how to use
 - $E^{\circ}_{\text{cell}} = (RT / nF) (\ln K)$ (At equilibrium) - don't need to know, but do need to know how to use
- Nernst Equation:
 - $E = E^{\circ}_{\text{cell}} - (RT/nF) \ln Q$ - don't need to know, but do need to know how to use
 - At equilibrium $E^{\circ}_{\text{cell}} = RT/nF \ln K$ - don't need to know, but do need to know how to use
- Electrolysis – what is it?
 - Electrolysis of water
 - Be able to do electrolysis calculations