AP Chemistry

Thou Shalt Not Forget

Credit: Dan Reid

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 reaction, the sign of E^o_{cell} changes, but if you double a reaction, E^o_{cell} DOES NOT change!!
7. $E^o_{cell} = E^o_{Red\ (GER)} - E^o_{Red\ (LEO)}$ (The other way to calculate $E^o_{cell} = E^o_{Reduction} + E^o_{Oxidation}$ ...but that involves reversing one of the reactions and changing the sign for E^o_{Red})
8. The half-reaction with a more (+) E^o_{Red} is the reaction that takes place at the cathode...GER.
9. When adding the two half reactions together, the electrons MUST cancel out.
10. $\Delta G^o = -nFE^o$ If ΔG^o is (−), then E^o_{cell} is (+). Reminder: n = # of electrons transferred
11. If Q increases, then the voltage (E_{cell}) of the battery goes down.
12. Electroplating/Electrolysis Calculation: $grams = \frac{(molar\ mass\ of\ metal)(amps)(seconds)}{(moles)(F)} \ldots g = \frac{(MM)(I)(t)}{nF}$