

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°_{cell} changes, but if you double a reaction, E°_{cell} DOES NOT change!!
7. $E^\circ_{\text{cell}} = E^\circ_{\text{Red (GER)}} - E^\circ_{\text{Red (LEO)}}$ (The other way to calculate $E^\circ_{\text{cell}} = E^\circ_{\text{Reduction}} + E^\circ_{\text{Oxidation}}$...but that involves reversing one of the reactions and changing the sign for E°_{Red})
8. The half-reaction with a more (+) E°_{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. $\Delta G^\circ = -nFE^\circ$ If ΔG° is (-), then E°_{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: $grams = \frac{(molar\ mass\ of\ metal)(amps)(seconds)}{(moles)(F)} \dots g = \frac{(MM)(I)(t)}{nF}$