AP Chemistry

Thou Shalt Not Forget

Credit: Dan Reid

**Thermochemistry**

1. Exothermic reactions: (−) ΔH; feels hot; heat is a product; temperature goes up…(endothermic is the opposite.)
2. ΔHrxn = Bonds broken − Bonds formed…(reactant bonds are broken; product bonds are formed)
3. Breaking bonds is endothermic. Forming bonds is exothermic.
4. ΔHrxn=ΔHproducts− ΔHreactants ...Don’t forget to multiply by the coefficients!!
5. If a reaction is exothermic, then the bonds formed in the products are stronger/more stable than the reactant bonds.
6. Doubling a reaction? ΔH will double. Reversing a reaction? The sign for ΔH changes. Adding reactions? Add the ΔH’s.

**Thermodynamics: ΔG and ΔS**

1. Thermodynamically favorable (spontaneous) reactions have a (−)ΔG.
2. Reactions with (−)ΔH and (+)ΔS are ALWAYS thermodynamically favorable…“enthalpy driven & entropy driven”
3. Reactions that increase the # of moles of gas have a (+)ΔS.
4. If ΔG is (−), then Keq >1.
5. ΔH and ΔS are usually NOT given in the same units!! When using ΔGo =ΔHo−TΔSo, make sure they match units.
6. ΔG = 0 at equilibrium.
7. When using ΔGo = −RT lnK, the value for R is 8.314 J/mol K so the answer for ΔG will be in the units of Joules.
8. Sometimes a reaction with a (−)ΔG does not proceed at a measurable rate. They are said to be under “kinetic control.” High activation energy is a common reason for a process to be under kinetic control.