Thou Shalt Not Forget

Credit: Dan Reid

Unit 2 – Thermodynamics

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 K_{eq} >1.
5. ΔH and ΔS are usually NOT given in the same units!! Be careful!
   When using $\Delta G^o = \Delta H^o - T\Delta S^o$, make sure they match units.
6. ΔG = 0 at equilibrium.
7. When using $\Delta G^o = -RT \ln K$, 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.

Thou Shalt Not Forget Questions

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Unit 2 – Thermodynamics

1. Thermodynamically favorable (spontaneous) reactions have what algebraic sign for ΔG?

2. a) Reactions with what signs for ΔH and ΔS are ALWAYS thermodynamically favorable?
   b) Reactions with what signs for ΔH and ΔS are NEVER thermodynamically favorable?
   c) If a reaction is "enthalpy driven & entropy driven", what are signs of ΔH and ΔS?

3. If a reaction increases the # of moles of gas, then the sign for ΔS is what?
   If a reaction decreases the # of moles of gas, then the sign for ΔS is what?

4. If ΔG is (−), then K_{eq} is greater than or less than 1?
   If ΔG is (+), then K_{eq} is greater than or less than 1?

5. What are the most common units for ΔH and ΔS?

6. At equilibrium, what is the value of ΔG?

7. a) When using $\Delta G^o = -RT \ln K$, the value w/ units for R is _____.
   b) If you use the value of 8.314 for R in the equation $\Delta G^o = -RT \ln K$, then what are the units for ΔG?

8. Why might a reaction with a (−)ΔG not proceed at a measureable rate?