

CHM 152 Group Work 5

- Predict whether the entropy change will be positive or negative for the following:
 - $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$ ΔS _____
 - $\text{C}_6\text{H}_{12}\text{O}_6(\text{s}) \rightarrow 2\text{C}_2\text{H}_5\text{OH}(\text{l}) + 2\text{CO}_2(\text{g})$ ΔS _____
 - $2\text{NH}_3(\text{g}) + \text{CO}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NH}_2\text{CONH}_2(\text{aq})$ ΔS _____
 - $\text{NaCl}(\text{s}) \rightarrow \text{NaCl}(\text{aq})$ ΔS _____
 - $\text{Cu}(\text{s}) (100^\circ\text{C}) \rightarrow \text{Cu}(\text{s}) (25^\circ\text{C})$ ΔS _____
 - $2\text{NH}_3(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + 3\text{H}_2(\text{g})$ ΔS _____
- Calculate $\Delta\text{H}^\circ_{\text{rxn}}$, $\Delta\text{S}^\circ_{\text{rxn}}$ and $\Delta\text{G}^\circ_{\text{rxn}}$ for $\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightleftharpoons \text{MgO}(\text{s})$ (*Hint – balance the rxn*)
- From # 2 the results for $\Delta\text{H}^\circ_{\text{rxn}}$ means (exothermic or endothermic), the results for $\Delta\text{S}^\circ_{\text{rxn}}$ means (disorder or order) increased, and $\Delta\text{G}^\circ_{\text{rxn}}$ means (products or reactants) are favored under standard conditions.
- Calculate K for $\text{MgCO}_3(\text{s}) \rightleftharpoons \text{MgO}(\text{s}) + \text{CO}_2(\text{g})$
- Calculate the temperature at which this reaction changes from being spontaneous to non spontaneous: $\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightleftharpoons \text{MgO}(\text{s})$. Is the reaction spontaneous above or **below** this temperature?
- Calculate ΔG for $\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightleftharpoons \text{MgO}(\text{s})$ at 30.5°C if the pressure of oxygen gas is 1.33 atm.