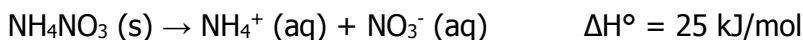


Name: _____

Date: _____

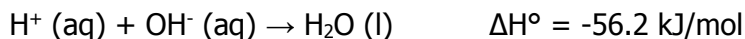
AP Chemistry: Thermodynamics Review

1. Consider the reaction:



- Yes. Entropy increases ($\Delta S > 0$) because the liquid state is less ordered than solid, OR more molecules is more disordered than fewer
- No. Since it is positive, the reaction is endothermic in the forward direction.

2. Consider the acid-base neutralization reaction:



- $\Delta S < 0$ (becomes more ordered from reactants to products), so does not favour spontaneity
- Yes, since the reaction is exothermic and $\Delta H > 0$.
- Enthalpy, since neutralization reactions are spontaneous. ΔH is dominant over ΔS , since the enthalpy favours spontaneity and the entropy does not.

3. Predict whether the entropy change is greater or less than zero for each of the following processes and explain:

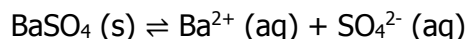
- $\Delta S < 0$
- $\Delta S > 0$
- $\Delta S > 0$
- $\Delta S < 0$

4. $\Delta S^\circ = -189 \text{ J/mol}\cdot\text{K}$

5. Reaction is spontaneous, $\Delta G = -2100 \text{ kJ}$

6. $\Delta S_{\text{vap}} = 109 \text{ J/mol}\cdot\text{K}$ (note that $\Delta G = 0$ for a phase change)

7. Consider the following reaction at standard conditions:



- $K = 1.09 \times 10^{-10}$
- $\Delta G = -12 \text{ kJ}$, so forward reaction is favoured (spontaneous)