

## Unit 5 - Topic 5

### Entropy

Entropy is the degree of randomness in a substance. The symbol for change in entropy is  $\Delta S$ . Solids are very ordered and have low entropy. Liquids and aqueous ions have more entropy because they move more freely. Gases have an even larger amount of entropy. According to the Second Law of Thermodynamics, nature is always proceeding towards a state of higher entropy (disorder).

Determine whether the following reactions show an **increase**, **decrease**, or **remain the same** in entropy.

- \_\_\_\_\_  $2\text{KClO}_3(\text{s}) \rightarrow 2\text{KCl}(\text{s}) + 3\text{O}_2(\text{g})$
- \_\_\_\_\_  $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{s})$
- \_\_\_\_\_  $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
- \_\_\_\_\_  $\text{NaCl}(\text{s}) \rightarrow \text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
- \_\_\_\_\_  $\text{KCl}(\text{s}) \rightarrow \text{KCl}(\text{l})$
- \_\_\_\_\_  $\text{CO}_2(\text{s}) \rightarrow \text{CO}_2(\text{g})$
- \_\_\_\_\_  $\text{H}^+(\text{aq}) + \text{C}_2\text{H}_3\text{O}_2^-(\text{aq}) \rightarrow \text{HC}_2\text{H}_3\text{O}_3(\text{l})$
- \_\_\_\_\_  $\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g})$
- \_\_\_\_\_  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g})$
- \_\_\_\_\_  $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$
- \_\_\_\_\_  $2\text{N}_2\text{O}_5(\text{g}) \rightarrow 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
- \_\_\_\_\_  $2\text{Al}(\text{s}) + 3\text{I}(\text{s}) \rightarrow 2\text{AlI}_3(\text{s})$
- \_\_\_\_\_  $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$
- \_\_\_\_\_  $2\text{NO}(\text{g}) \rightarrow \text{N}_2(\text{g}) + \text{O}_2(\text{g})$
- \_\_\_\_\_  $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$