

Quiz #5

Unless otherwise specified, each question is worth 4 points.

1. Indicate whether each of the following processes produces an increase or decrease in the entropy of the system:

- a. $\text{CO}_2(s) \rightarrow \text{CO}_2(g)$ INCREASE
- b. $\text{CaO}(s) + \text{CO}_2(g) \rightarrow \text{CaCO}_3(s)$ DECREASE
- c. $\text{HCl}(g) + \text{NH}_3(g) \rightarrow \text{NH}_4\text{Cl}(s)$ DECREASE
- d. $2 \text{SO}_2(g) + \text{O}_2(g) \rightarrow 2 \text{SO}_3(g)$ DECREASE

2. Using the standard entropies given below, calculate the standard entropy change, ΔS° , for the following reaction at 298 K:



Substance	S° [$\text{J}/\text{mol}\cdot\text{K}$]
$\text{Al}(s)$	28.3
$\text{Al}_2\text{O}_3(s)$	51.0
$\text{H}_2(g)$	131
$\text{H}_2\text{O}(g)$	189

$$\begin{aligned} \Delta S &= (2(28.3) + 3(189)) - (51.0 + 3(131)) \\ &= 56.6 + 567 - 51.0 - 393 \\ &= 179.6 \end{aligned}$$

$180. \frac{\text{J}}{\text{K}}$

