

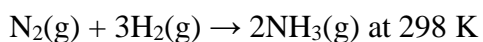
Name \_\_\_\_\_ Date \_\_\_\_\_

# Worksheet 15.1: Entropy and spontaneity

- 1 Fill in the following table, stating whether there is an increase or decrease in entropy and giving a reason for this.

Reaction	Increase or decrease in entropy?	Reason
ice $\rightarrow$ water		
$\text{C}_2\text{H}_4(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{C}_2\text{H}_6(\text{g})$		
$2\text{C}_2\text{H}_6(\text{g}) + 7\text{O}_2(\text{g}) \rightarrow 4\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l})$		
$\text{N}_2\text{O}_4(\text{g}) \rightarrow 2\text{NO}_2(\text{g})$		
$\text{NH}_3(\text{g}) + \text{HCl}(\text{g}) \rightarrow \text{NH}_4\text{Cl}(\text{s})$		
$2\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{CO}(\text{g})$		

- 2 Using data in the table, calculate the entropy for the following reaction:



	$S^\circ / \text{J K}^{-1} \text{mol}^{-1}$
$\text{N}_2$	192
$\text{H}_2$	131
$\text{NH}_3$	192

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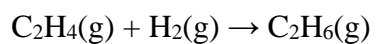


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- 3 Using data in the table provided, calculate  $\Delta S$  for the following reaction and comment on the value obtained:



	$S^\circ / \text{J K}^{-1} \text{mol}^{-1}$
$\text{C}_2\text{H}_4(\text{g})$	201
$\text{H}_2(\text{g})$	131
$\text{C}_2\text{H}_6(\text{g})$	230

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