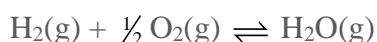


Name _____ Date _____

End of Chapter 15 test

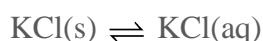
This test and its sample answers have been written by the authors. IB may award marks differently.

- 1 For the following reaction, will there be an increase or decrease in entropy?



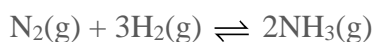
- A increase
- B decrease
- C stay the same
- D need more information

- 2 For the following reaction, will there be an increase or decrease in entropy?[1]



- A increase
- B decrease
- C stay the same
- D need more information

- 3 For the following reaction, will there be an increase or decrease in entropy?



- A increase
- B decrease
- C stay the same
- D need more information

- 4 Calculate ΔS for this reaction $\text{C}_2\text{H}_4(\text{g}) + \text{H}_2(\text{g}) \rightleftharpoons \text{C}_2\text{H}_6(\text{g})$ using the following data:

	$S^\circ / \text{J K}^{-1} \text{mol}^{-1}$
$\text{C}_2\text{H}_4(\text{g})$	220
$\text{H}_2(\text{g})$	130.6
$\text{C}_2\text{H}_6(\text{g})$	230

- A $10 \text{ J K}^{-1} \text{mol}^{-1}$
- B $-10 \text{ J K}^{-1} \text{mol}^{-1}$
- C $120.6 \text{ J K}^{-1} \text{mol}^{-1}$
- D $-120.6 \text{ J K}^{-1} \text{mol}^{-1}$

- 5 Calculate ΔS for this reaction, $\text{C}_2\text{H}_4(\text{g}) + 3\text{O}_2(\text{g}) \rightleftharpoons 2\text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g})$, using the following data:

	$S^\circ / \text{J K}^{-1} \text{mol}^{-1}$
$\text{C}_2\text{H}_4(\text{g})$	220
$\text{O}_2(\text{g})$	161.1
$\text{CO}_2(\text{g})$	213.8
$\text{H}_2\text{O}(\text{g})$	188.8

- A $-101.9 \text{ J K}^{-1} \text{mol}^{-1}$
 B $101.9 \text{ J K}^{-1} \text{mol}^{-1}$
 C $21.5 \text{ J K}^{-1} \text{mol}^{-1}$
 D $-21.5 \text{ J K}^{-1} \text{mol}^{-1}$
- 6 Consider the reaction $2\text{C}(\text{s}) + 2\text{H}_2(\text{g}) \rightleftharpoons \text{C}_2\text{H}_4(\text{g})$ at 298 K. Calculate ΔG° using the following data:

	$\text{C}(\text{s})$	$\text{H}_2(\text{g})$	$\text{C}_2\text{H}_4(\text{g})$
$\Delta H_f / \text{kJ mol}^{-1}$	0	0	-84
$S / \text{J K}^{-1} \text{mol}^{-1}$	5.74	130.7	220

- A 1238 kJ mol^{-1}
 B $-82.7 \text{ kJ mol}^{-1}$
 C $15\,674.2 \text{ kJ mol}^{-1}$
 D $-68.2 \text{ kJ mol}^{-1}$
- 7 In a reaction, if ΔH is negative and ΔS is positive, what will be the sign of ΔG° if the temperature increases?
- A always negative
 B always positive
 C will become negative
 D will become positive
- 8 For the reaction in Question 7, is the reaction spontaneous?
- A all the time
 B never
 C becomes spontaneous
 D becomes non-spontaneous

END OF TEST