

Day 4.6 Warm-Up: Thermo Practice MC

1. A reaction determined to be spontaneous only at very high temperatures. Which of the following is true regarding this reaction?
 - (A) ΔH and ΔS are both positive.
 - (B) ΔH and ΔS are both negative.
 - (C) ΔH is negative, but ΔS is positive.
 - (D) ΔH is positive, but ΔS is negative.

2. It is determined that for a particular process, $\Delta H = +185 \text{ kJ/mol}$ and $\Delta S = +1.80 \text{ J/mol}\cdot\text{K}$. At what temperature does the reaction become spontaneous?
 - (A) 0.00973 K
 - (B) 376 K
 - (C) $1.03 \times 10^5 \text{ K}$
 - (D) 187 K

3. Which of the following statements is true?
 - (A) In a spontaneous process, ΔG has a positive value.
 - (B) Exothermic reactions are always spontaneous.
 - (C) The entropy of the universe is increasing.
 - (D) For a process to be spontaneous, the number of moles of product must exceed the number of moles of reactant.

4. The standard free energy of formation of NaBr(s) is -347 kJ/mol . Calculate ΔG° for the reaction: $2 \text{ NaBr(s)} \rightarrow 2 \text{ Na(s)} + \text{Br}_2\text{(g)}$
 - (A) 347 kJ
 - (B) 694 kJ
 - (C) -694 kJ
 - (D) -347 kJ

5. Calculate ΔS° for the following reaction: $2 \text{NH}_3(g) \rightarrow 3 \text{H}_2(g) + \text{N}_2(g)$

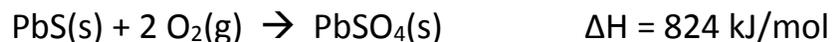
Substance	S° J/(K mol)
$\text{NH}_3(g)$	193
$\text{H}_2(g)$	131
$\text{N}_2(g)$	192

- (A) 199 J/mol · K
- (B) 971 J/mol · K
- (C) -212 J/mol · K
- (D) -54 J/mol · K

6. Which of the following is true when a gas condenses into a liquid?

- (A) ΔH and ΔS are both positive.
- (B) ΔH and ΔS are both negative.
- (C) ΔH is negative, but ΔS is positive.
- (D) ΔH is positive, but ΔS is negative.

7. Calculate the heat evolved in the formation of 1 mole of $\text{PbSO}_4(s)$ from its elements, given the following:



- (A) 730 kJ/mol
- (B) -730 kJ/mol
- (C) 918 kJ/mol
- (D) -918 kJ/mol