

AP Chemistry

Name: _____ Score: _____

1. When ice melts to water, the entropy...
 - ☐ increases
 - ☐ decreases
 - ☐ stays the same
2. A reaction's entropy change is...
 - ☐ sum of products minus sum of reactants
 - ☐ sum of reactants minus sum of products
 - ☐ the sum of everything
3. A reaction is thermodynamically favourable when ΔG is...
 - ☐ negative
 - ☐ positive
 - ☐ exactly 100
4. Which quantity tells you whether a reaction is thermodynamically favourable?
 - ☐ ΔG
 - ☐ the activation energy
 - ☐ the molar mass
5. A reaction with $\Delta G^\circ < 0$ has an equilibrium constant that is...
 - ☐ greater than 1
 - ☐ less than 1
 - ☐ exactly 0
6. Reaction A has $\Delta G = +15$; reaction B has $\Delta G = -40$. The total ΔG coupled?

7. A current of 5 A flows for 200 s. The total charge (in C)?
_____ C
8. An element in its standard state has a standard entropy of zero.
 - ☐ True ☐ False

9. With $\Delta H = -100$ kJ, $T = 300$ K, $\Delta S = 0.2$ kJ/K, find ΔG (in kJ).

_____ kJ

10. A reaction with $\Delta G < 0$ can still be far too slow to observe.

☐ True ☐ False

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1. **increases**

Liquid water is more disordered than solid ice.

2. **sum of products minus sum of reactants**

$$\Delta S = \sum S^\circ(\text{products}) - \sum S^\circ(\text{reactants}).$$

3. **negative**

$\Delta G < 0$ means the reaction is favourable.

4. ΔG

ΔG decides favourability; activation energy decides speed.

5. **greater than 1**

Negative ΔG° favours products, so $K > 1$.

6. **-25**

$15 + (-40) = -25$, so the pair is favourable.

7. **1000 C**

$$Q = It = 5 \times 200 = 1000 \text{ C}.$$

8. **False**

Unlike formation enthalpy, every substance has a positive S° .

9. **-160 kJ**

$$\Delta G = \Delta H - T\Delta S = -100 - (300)(0.2) = -160 \text{ kJ}.$$

10. **True**

A large activation energy makes a favourable reaction slow.