

9. Thermodynamics and Electrochemistry

Starter Quiz · 课前小测

AP Chemistry

Name: _____ Score: _____

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

- A current of 5 A flows for 200 s. The total charge (in C)?
_____ C
- 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

AP Chemistry1. **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.