

JEE MAIN THERMODYNAMICS — ENTHALPY OF PHASE TRANSITION, LATTICE, SOLUTION, DILUTION AND NEUTRALISATION — PYQS

Max. Marks: 20

Questions: 5

Section A (MCQ) — 4 questions

Q.1 Total enthalpy change for freezing of 1 mol of water at 10°C to ice at -10°C is _____

(Given: $\Delta_{\text{fus}}H = x \text{ kJ/mol}$) $C_p[\text{H}_2\text{O}(\text{l})] = y \text{ J mol}^{-1} \text{ K}^{-1}$ $C_p[\text{H}_2\text{O}(\text{s})] = z \text{ J mol}^{-1} \text{ K}^{-1}$

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) $-x-10y-10z$ (2) $x-10y-10z$
 (3) $-10(100x + y + z)$ (4) $10(100x + y + z)$

Scan or tap for the
full solution



Q.2 The hydration energies of K^+ and Cl^- are $-x$ and $-y$ kJ/mol respectively. If the lattice energy of KCl is $-z$ kJ/mol, then the heat of solution of KCl is :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) $x + y + z$ (2) $z - (x + y)$
 (3) $-z - (x + y)$ (4) $x - y - z$

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Q.3 Consider the given data :

(a) $\text{HCl}(\text{g}) + 10\text{H}_2\text{O}(\text{l}) \longrightarrow \text{HCl} \cdot 10\text{H}_2\text{O}$; $\Delta H = -69.01 \text{ kJ mol}^{-1}$ (b) $\text{HCl}(\text{g}) + 40\text{H}_2\text{O}(\text{l}) \longrightarrow \text{HCl} \cdot 40\text{H}_2\text{O}$; $\Delta H = -72.79 \text{ kJ mol}^{-1}$

Choose the correct statement :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) The heat of dilution for the HCl ($\text{HCl} \cdot 10\text{H}_2\text{O}$ to $\text{HCl} \cdot 40\text{H}_2\text{O}$) is 3.78 kJ mol^{-1} .
 (2) Dissolution of gas in water is an endothermic process.
 (3) The heat of solution depends on the amount of solvent.
 (4) The heat of formation of HCl solution is represented by both (a) and (b).

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Q.4 Given below are two statements:

Statement-I: When a system containing ice in equilibrium with water (liquid) is heated, heat is absorbed by the system and there is no change in the temperature of the system until whole ice gets melted.

Statement-II: At melting point of ice, there is absorption of heat in order to overcome intermolecular forces of attraction within the molecules of water in ice and kinetic energy of molecules is not increased at melting point.

In the light of the above statements, choose the correct answer from the options given below

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) Both Statement-I and Statement-II are false
 (2) Statement-I is true but Statement-II is false
 (3) Both Statement-I and Statement-II are true
 (4) Statement-I is false but Statement-II is true

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Section B (Numerical) — 1 question

Q.5 If the enthalpy of sublimation of Li is 155 kJ mol^{-1} , enthalpy of dissociation of F_2 is 150 kJ mol^{-1} , ionization enthalpy of Li is 520 kJ mol^{-1} , electron gain enthalpy of F is -313 kJ mol^{-1} , standard enthalpy of formation of LiF is -594 kJ mol^{-1} . The magnitude of lattice enthalpy of LiF is _____ kJ mol^{-1} . (Nearest Integer)

[JEE Main 2026 (Online) 22nd January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 4 questions

Ques.	1	2	3	4						
Ans.	3	2	3	3						

Section B (Numerical) — 1 question

Ques.	5								
Ans.	1031								