



MORE QUESTIONS SOLVED

I. Very Short Answer Type Questions

Question 1. If $\Delta U = 0$ how are q and w related to each other?

Answer: $\Delta U = q + w$

Question 2. When is bond energy equal to bond dissociation energy?

Answer: For diatomic molecules e.g. H_2 , O_2 , Cl_2 etc. both energies are equal.

Question 3. What is the enthalpy of formation of the most stable form of an element in its standard state?

Answer: It is zero.

Question 4. Out of diamond and graphite, which has greater entropy?

Answer: Graphite has greater entropy since it is loosely packed.

Question 5. At what temperature entropy of a substance is zero?

Answer: At absolute zero.

Question 6. From thermodynamic point of view, to which system the animals and plants belong?

Answer: Open system.

Question 7. Predict the sign of ΔS for the following reaction heat $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

Answer: ΔS is positive.

Question 8. State Hess's law.

Answer: The change of enthalpy of a reaction remains same whether the reaction is carried out in one step or several steps.

$\Delta H = \Delta H_1 + \Delta H_2 + \Delta H_3$

Question 9. What is the enthalpy change for an adiabatic process?

Answer: For an adiabatic process, $\Delta H = 0$

Question 10. What do you mean by entropy?

Answer: Entropy is a measure of randomness of a system.

Question 11. Give a relation between entropy change and heat absorbed or evolved for a reversible reaction occurring at temperature T .

Answer: $\Delta s = q_{rev}/T$

Question 12. What is the condition for spontaneity in terms of free energy change?

Answer:

If ΔG is negative, process is spontaneous.

If ΔG is positive, the process is non-spontaneous.

If $\Delta G = 0$, the process is in equilibrium.

Question 13. What is an adiabatic process?

Answer: The process in which no exchange of heat takes place between the system and the surroundings.

Question 14. What is free energy in terms of thermodynamics?

Answer: Free energy of a system is the capacity to do work.

$$G = H - T\Delta S$$

Question 15. Define extensive properties.

Answer: Properties which depend upon the amount of the substance are called as extensive properties.

Question 16. How are internal energy change, free energy change and entropy change are related to one another?

Answer: $\Delta G = \Delta H - T\Delta S$ (At constant pressure)

Question 17. How is entropy of a substance related to temperature?

Answer: On increasing temperature, entropy of a substance increases.

Question 18. Define intensive properties.

Answer: Properties which depend on the nature of the substance and not on the amount of the substance are called intensive properties.

Question 19. What is Gibbs Helmholtz equation?

Answer:

$$\Delta G = \Delta H - T\Delta S$$

Where ΔG = free energy change.

ΔH = enthalpy change.

ΔS = entropy change.

Question 20. What are the units of entropy?

Answer: SI unit of $\Delta S = \text{JK}^{-1}\text{mol}^{-1}$.

Question 21. What is a spontaneous change? Give one example.

Answer:

A process which can take place of its own or initiate under some condition.

For example: Common salt dissolves in water of its own.

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