IV. Multiple Choice Questions

Question 1. Thermodynamics is applicable to
(a) macroscopic system only
(b) microsopic system only
(c) homogeneous system only
(d) heterogeneous system only
Question 2. An isochoric process takes place at constant
(a) temperature
(b) pressure
(c) volume
(d) concentration
Question 3. For a cyclic process, the change in internal energy of the system is
(a) always +ve
(b) equal to zero
(c) always -ve
(d) none of the above
Question 4. Which of the following properties is not a function of state?
(a) concentration
(b) internal energy
(c) enthalpy
(d) entropy
Question 5. Which of the following relation is true?
Question 6. Which of the following always has a negative value?
(a) heat of reaction
(b) heat of solution
(c) heat of combustion
(d) heat of formation
Question 7. The bond energy depends upon
(a) size of the atom
(b) electronegativity
(c) bond length
(d) all of the above
Question 8. For an endothermic reaction.
(a) ΔH is -ve
(b) ΔH is +ve
(c) ΔH is zero
(d) none of these
Question 9. The process depicted by the equation.
H_2O (S) → H_2O (l)
ΔH = +1.43 kcal represents
(a) fusion
(b) melting
(c) evaporation
(d) boilirtg
Question 10.Which one is the correct unit for entropy?
(a) KJ mol
(b) JK mol
(c) JK mol^{-1}
(d) KJ mol^{-1}
Answer:
1. (a)
2. (c)

3. (b)
4. (a)
5. (a)
6. (c)
7. (d)
8. (b)
9. (a)
10. (c)

V. Hots Questions

Question 1. Why standard entropy of an elementary substance is not zero whereas standard enthalpy of formation is taken as zero?
Answer: A substance has a perfectly ordered arrangement only at absolute zero. Hence, entropy is zero only at absolute zero. Enthalpy of formation is the heat change involved in the formation of one mole of the substance from its elements. An element formed from its constituents means no heat change.

Question 2.
The equilibrium constant for a reaction is one or more if $\Delta G^{\ominus}$ for it is less than zero. Explain.
Answer:
$\Delta_r G^{\ominus} = -RT \ln K$, thus if $\Delta G^{\ominus}$ is less than zero *i.e.*, it is negative, then InK will be positive and hence K will be greater than one.

Question 3. Many thermodynamically feasible reactions do not occur under ordinary conditions. Why?
Answer: Under ordinary conditions, the average energy of the reactants may be less than threshold energy. They require some activation energy to initiate the reaction.

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