Arjuna NEET (2024)

Thermodynamics

DPP-06

1. Which of the following conditions is not favourable for the feasibility of a process?
(1) ΔH = – ve, $T\Delta S$ = – ve and $T\Delta S < \Delta H$
(2) ΔH = + ve, $T\Delta S$ = + ve and $T\Delta S > \Delta H$
(3) ΔH = – ve, $T\Delta S$ = + ve and $\Delta H > T\Delta S$
(4) ΔH = + ve, $T\Delta S$ = + ve and $\Delta H > T\Delta S$

2. In which of the following cases, the reaction is spontaneous at all temperatures?
(1) $\Delta H > 0, \Delta S > 0$ (2) $\Delta H < 0, \Delta S > 0$
(3) $\Delta H < 0, \Delta S < 0$ (4) $\Delta H > 0, \Delta S < 0$

3. For an endothermic reaction, ΔS is positive. The reaction is:
(1) Feasible when $T\Delta S > \Delta H$
(2) Feasible when $\Delta H > T\Delta S$
(3) Feasible at all temperatures
(4) Not feasible at all

4. Which of the following is true for the reaction $H_2O(\ell) \rightleftharpoons H_2O(g)$ at 100°C and 1 atmosphere
(1) $\Delta S = 0$ (2) $\Delta H = 0$
(3) $\Delta H = \Delta E$ (4) $\Delta H = T\Delta S$

5. For a reaction to be spontaneous at all temperatures
(1) ΔG and ΔH should be negative
(2) $\Delta H = \Delta G = 0$
(3) ΔG and ΔH should be positive
(4) $\Delta H < \Delta G$

6. Match the following in List-I with List-II and select the correct option:

List - I		List-II	
a.	$K_p = Q$	i.	Always nonspontaneous
b.	$T > \Delta H/\Delta S$	ii.	Isothermal process
c.	ΔH = +ve ΔS = –ve	iii.	Equilibrium
d.	q = –w	iv.	Spontaneous and endothermic

(1) a-iii, b-iv, c-i, d-ii
(2) a-i, b-iii, c-ii, d-iv
(3) a-iii, b-i, c-iv, d-ii
(4) a-iii, b-ii, c-i, d-iv

7. Match the column:

Sign of ΔH & ΔS respectively		Nature of reaction	
A	– & –	P	Spontaneous only at low temperature
B	– & +	Q	Spontaneous only at high temperature
C	+ & +	R	Spontaneous at all temperature
D	+ & –	S	Non spontaneous at all temperature

(1) A → P, B → R, C → Q, D → S
(2) A → R, B → P, C → Q, D → S
(3) A → Q, B → R, C → P, D → S
(4) A → P, B → Q, C → R, D → S

8. Which of the following is correct for a spontaneous process?
(1) $\Delta H < 0, \Delta S > 0$ at all possible temperature
(2) $\Delta G > 0$
(3) $\Delta S > 0$
(4) $E_{cell} < 0$

9. Which of the following thermodynamic properties must be associated with a reaction spontaneous at only high temperatures?
(1) $\Delta H < 0, \Delta S < 0$ (2) $\Delta H < 0, \Delta S > 0$
(3) $\Delta H > 0, \Delta S > 0$ (4) $\Delta H > 0, \Delta S < 0$

10. $A + B \longrightarrow C + D$
$\Delta H = -10{,}000\ J\ mol^{-1}$
$\Delta S = -33.3\ J\ K^{-1}\ mol^{-1}$
At what temperature the reaction will occur spontaneous from left to right?
(1) = 300.3 K (2) > 300.3 K
(3) < 300.3 K (4) None of these

11. The entropy of vaporization of benzene is 85 $JK^{-1}\ mol^{-1}$. When 117 g benzene vaporizes at its normal boiling point, the entropy change of surrounding is:
(1) – 85 J/K (2) –85 × 1.5 J/K
(3) 85 × 1.55 J/K (4) None of these

12. Which of the following condition regarding a chemical process ensures spontaneity at all temp.?
(1) $\Delta H < 0, \Delta S > 0$ (2) $\Delta H > 0, \Delta S < 0$
(3) $\Delta H < 0, \Delta S < 0$ (4) $\Delta H > 0, \Delta S > 0$

13. For a given reaction, $\Delta H = 40$ kJ mol^{-1} and $\Delta S = 80$ JK^{-1} mol^{-1}. The reaction is spontaneous at (assume that ΔH and ΔS do not vary with temperature)
(1) $T > 500$ (2) $T < 500$
(3) All temperature (4) $T > 298$

14. A reaction occur spontaneously. If
(1) $T\Delta S = \Delta H$ and both ΔH and ΔS are positive
(2) $T\Delta S > \Delta H$ and both ΔH and ΔS are positive
(3) $T\Delta S > \Delta H$ and both ΔH and ΔS are negative
(4) $T\Delta S = \Delta H$ and both ΔH is positive and ΔS is negative

Note: Kindly find the Video Solution of DPPs Questions in the DPPs Section.

Answer Key

1.	**(4)**	**8.**	**(1)**
2.	**(2)**	**9.**	**(3)**
3.	**(1)**	**10.**	**(3)**
4.	**(4)**	**11.**	**(2)**
5.	**(1)**	**12.**	**(1)**
6.	**(1)**	**13.**	**(1)**
7.	**(1)**	**14.**	**(2)**

PW Web/App - https://smart.link/7wwosivoicgd4

Library- https://smart.link/sdfez8ejd80if