Arjuna NEET (2024)

Thermodynamics

DPP-08

1. The heat of neutralization of HCl by NaOH is –55.9 KJ/mol. If the heat of neutralization of HCN by NaOH is –12.1 KJ/mol. The energy of dissociation of HCN is

(1) –43.8 KJ (2) 43.8 KJ
(3) 68 KJ (4) –68 KJ

2. Heat evolved in the reaction $H_2 + Cl_2 \rightarrow 2HCl$ is 182 KJ. Bond energies of H–H and Cl–Cl are 430 and 242 KJ/mol respectively. The H – Cl bond energy is:

(1) 245 KJ mol^{-1} (2) 427 KJ mol^{-1}
(3) 336 KJ mol^{-1} (4) 154 KJ mol^{-1}

3. Enthalpy of neutralisation of CH_3COOH by NaOH is –50.6 kJ/mol and the heat of neutralisation of a strong acid with NaOH is –55.9 kJ/mol. The value of ΔH for the ionisation of CH_3COOH is

(1) 3.5 kJ/mol (2) 4.6 kJ/mol
(3) 5.3 kJ/mol (4) 6.4 kJ/mol

4. The bond dissociation energy of gaseous H_2, Cl_2 and HCl are 104, 58 and 103 kcal mol^{-1} respectively. The enthalpy of formation for HCl gas will be

(1) –44.0 kcal (2) –22.0 kcal
(3) 22.0 kcal (4) 44.0 kcal

5. AB, A_2 and B_2 are diatomic molecules. If the bond enthalpies of A_2, AB and B_2 are in the ratio 1 : 1 : 0.5 and enthalpy of formation of AB from A_2 and B_2 is – 100 kJ/mol^{-1}. What is the bond enthalpy of A_2.?

(1) 400 kJ/mol (2) 200 kJ/mol
(3) 100 kJ/mol (4) 300 kJ/mol

6. If the bond energies of H–H, Br–Br and H–Br are 433, 192 and 364 kJ mol^{-1} respectively, then ΔH^o for the reaction

$H_2(g) + Br_2(g) \rightarrow 2HBr(g)$ is

(1) – 261 kJ (2) + 103 kJ
(3) + 261 kJ (4) – 103 kJ

7. Match the column:

A	$C_{(s,\ graphite)} + O_2 \rightarrow CO_{2(g)}$	P	$\Delta H°_{Combustion}$
B	$CO_{(g)} + 1/2O_{2(g)} \rightarrow CO_{2(g)}$	Q	$\Delta H°_{sublimation}$
C	$CH_{4(g)} \rightarrow C_{(g)} + 4H_{(g)}$	R	$\Delta H°_{formation}$
D	$C_{(s,\ graphite)} \rightarrow C_{(g)}$	S	$\Delta H°_{atomisation}$

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

8. When 0.5 g of sulphur is burnt to SO_2, 4.6 kJ of heat is liberated. What is the enthalpy of formation of Sulphur dioxide.

(1) +147.2 kJ (2) –147 kJ
(3) –294.4 kJ (4) +294.4 kJ

9. The species which by definition has zero standard molar enthalpy of formation at 298 K is:

(1) $Br_2(g)$ (2) $Cl_2(g)$
(3) $H_2O(g)$ (4) $CH_4(g)$

10. The enthalpies of formation of N_2O and NO at 298 K are 82 and 90 kJ mol^{-1}. The enthalpy of the reaction:

$N_2O(g) + ½O_2(g) \rightarrow 2NO(g)$

(1) – 8 kJ (2) 98 kJ
(3) – 74 kJ (4) 8 kJ

11. Calculate the heat required to make 6.4 Kg CaC_2 from CaO(s) and C(s) from the reaction:

$CaO(s) + 3\ C(s) \rightarrow CaC_2(s) + CO(g)$ given that $\Delta_f H°$ (CaO) = -151.6 kcal, $\Delta_f H°$ (CaC_2) = – 14.2 kcal.

$\Delta_f H°$ (CO) = – 26.4 kcal.

(1) 5624 kcal (2) 1.11×10^4 kcal

(3) 86.24×10^3 (4) 1100 kcal

12. The enthalpies of elements in their standard states are taken as zero. Hence the enthalpy of formation of a compound

(1) Should always be negative

(2) Should always be positive

(3) Will be equal to twice the energy of combination

(4) May be positive or negative

13. Which of the following equations represents standard heat of formation of methane?

(1) C (diamond) + $2H_2(g) \rightarrow CH_4(g)$

(2) C (graphite) + $2H_2(g) \rightarrow CH_4(g)$

(3) C (diamond) + $4H(g) \rightarrow CH_4(g)$

(4) C (graphite) + $4H(g) \rightarrow CH_4(g)$

14. For the reaction,

$2H_2O(l) \rightarrow 2H_2(g) + O_2(g)\ \Delta H = 571.6$ KJ

$\Delta_f H°$ of water is:

(1) 285.8 kJ (2) – 285.8 kJ

(3) 1143.2 kJ (4) – 1143.2kJ

15. Bond dissociation enthalpy is used to defining enthalpy change of a reaction as

(1) $\Delta H_r = \Sigma(\text{Bond dissociation enthalpy})_{\text{Reactant}} - \Sigma(\text{Bond dissociation enthalpy})_{\text{Product}}$

(2) $\Delta H_r = \Sigma(\text{Bond dissociation enthalpy})_{\text{Product}} - \Sigma(\text{Bond dissociation enthalpy})_{\text{Reactant}}$

(3) $\Delta H_r = \Sigma(\text{Bond dissociation enthalpy})_{\text{Product}} + \Sigma(\text{Bond dissociation enthalpy})_{\text{Reactant}}$

(4) None of these

16. The enthalpy of neutralization of any strong acid and strong base is nearly equal to

(1) + 57.3 kJ/mol

(2) – 75.3 kJ/mol

(3) + 75.3 kJ/mol

(4) – 57.3 kJ/eq

17. Heat of neutralization of strong acid by a strong base is equal to ΔH of

(1) $H^+ + OH^- \longrightarrow H_2O$

(2) $H_2O + H^+ \longrightarrow H_3O^+$

(3) $2H_2 + O_2 \longrightarrow 2H_2O$

(4) $NH_4OH + HCl \longrightarrow NH_4Cl + H_2O$

18. In The heat released in neutralization of HCl and NaOH is 13.7 kcal/mol, the heat released on neutralization of NaOH with CH_3COOH is 3.7 kcal/mol. The ΔH° of ionization of CH_3OOOH is

(1) 10.2 kcal (2) 10 kcal

(3) 3.7 kcal (4) 9.5 kcal

19. Heat of combustion of a substance:

(1) Is always positive

(2) Is always negative

(3) Is equal to heat of formation

(4) Nothing can be said without reaction

20. $Na(s) \longrightarrow Na(g)$, the heat of reaction is called as

(1) Heat of vaporisation

(2) Heat of atomisation

(3) Heat of sublimation

(4) Both (2) and (3)

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

Answer Key

1.	(2)	11.	(2)
2.	(2)	12.	(4)
3.	(3)	13.	(2)
4.	(2)	14.	(2)
5.	(1)	15.	(1)
6.	(4)	16.	(4)
7.	(4)	17.	(1)
8.	(3)	18.	(2)
9.	(2)	19.	(2)
10.	(2)	20.	(4)

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

Library- https://smart.link/sdfez8ejd80if