DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 2

Topic :- THERMODYNAMICS

1 **(c)**
Heat of formation of H_2O = − heat of decomposition of water.

2 **(a)**
$T_{f irreversible} > T_{f reversible}$ it is an adiabatic expansion and W(rev) is maximum.

3 **(c)**
Molecular solids are covalent compounds having low m.p.

4 **(a)**
$\Delta H = H_P - H_R$
Thus, ΔH is negative because $H_P < H_R$.

5 **(b)**
$\Delta G = -$ ve for a spontaneous change.

6 **(d)**
Ideal gas does not show intermolecular forces of attractions.

7 **(b)**
Rest all are correct .

8 **(a)**
During solidification disorder decreases.

9 **(a)**
$$\Delta S = \frac{\Delta H_f}{T} = \frac{2930}{300} = 9.77 \text{ J mol}^{-1}\text{K}^{-1}$$

10 **(d)**
$\Delta G = \Delta H - T\Delta S$
The reaction will be spontaneous
If $T\Delta S > \Delta$H ($i.e.,\Delta G = -$ve)
$$T > \frac{\Delta H}{\Delta S} = \frac{170}{170 \times 10^{-3}} = 1000 \text{ K}$$

11 **(c)**
θ is independent of initial amount as long as relative amount is constant

12 **(b)**
$q = \Delta U - W$, if adiabatic process $q = 0$, then $-\Delta U = -W$, *i.e.*, a decrease in free energy brings in work done by the system ($-W$).

13 **(a)**

As the system is closed and insulated, no heat enter or leave the system, ie, $q = 0$

$\therefore \Delta E = q + W = W$

14 **(b)**

$XY \rightarrow X(g) + Y(g);\ \Delta H = +a$ kJ/mol ...(i)

$X_2 \rightarrow 2X;\ \Delta H = +a$ kJ/mol ...(ii)

$Y_2 \rightarrow 2Y;\ \Delta H = +0.5a$ kJ/mol ...(iii)

$\frac{1}{2} \times$ (ii) $+ \frac{1}{2} \times$ (iii) $-$ (i) gives

$$\frac{1}{2}X_2 + \frac{1}{2}Y_2 \rightarrow XY$$

$$\Delta H = \left(+ \frac{a}{2} + \frac{0.5}{2}a - a \right) \text{kJ/mol}$$

$$\therefore \ -200 = + \frac{a}{2} + \frac{0.5a}{2} - a$$

or $a = 800$

15 **(d)**

$CH_4 \rightarrow C + 4H;\ \Delta H = 360$ kcal/mol

$e_{C-H} = 90$ kcal

$C_2H_6 \rightarrow 2C + 6H;\ \Delta H = 620$ kcal/mol

$\therefore \quad 620 = e_{C-C} + 6e_{C-H}$

$\therefore \quad e_{C-C} = 620 - 540 = 80$ kcal/mol

16 **(d)**

Molecular weight of $NH_4NO_3 = 80$

$\therefore$ Molar heat of decomposition

$H = ms\Delta t = 80 + 1.23 \times 6.12$

$= 602$ kJ/mol

17 **(b)**

Greater is bond energy more is stability to bond.

18 **(a)**

Due to high bond energy of $N \equiv N$, more heat is absorbed to break up N_2 molecule.

19 **(a)**

$$\Delta S_{vap} = \frac{(900 \times 18)}{373} = 43.4 \text{ JK}^{-1}\text{mol}^{-1}$$

20 **(b)**

For spontaneous reaction $\Delta G = -$ ve.

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

$\Delta H = +$ ve, $\Delta S = +$ ve and $T\Delta S > \Delta H$

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	A	C	A	B	D	B	A	A	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	B	A	B	D	D	B	A	A	B