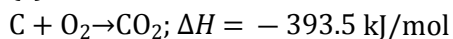


Topic :- THERMODYNAMICS

- 1 (c)
 $\text{Ag}^+ + \text{Cl}^- \rightarrow \text{AgCl}$ is a spontaneous reaction.
- 2 (b)
 $\text{C}_2\text{H}_4 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$
Thus, V_{O_2} used = $\frac{6226 \times 3 \times 22.4}{1411}$
= 296.5 litre
- 3 (c)
 CS_2 is formed from its initial components carbon and hydrogen.
- 4 (d)
 $\text{C} + \text{O}_2 \rightarrow \text{CO}_2(\text{g}); \Delta H = -94 \text{ kJ} \dots (\text{i})$
 $\text{Ca} + \frac{1}{2}\text{O}_2 \rightarrow \text{CaO}(\text{s}); \Delta H = -152 \text{ kJ} \dots (\text{ii})$
 $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g}); \Delta H = 42 \text{ kJ} \dots (\text{iii})$
By eq. [(i) + (ii)] - (iii),
 $\text{Ca} + \text{C} + \frac{3}{2}\text{O}_2 \rightarrow \text{CaCO}_3; \Delta H = -288 \text{ kJ}.$
- 5 (a)
 $PV^\gamma = \text{constant}$ for adiabatic expansion and
 $PV = \text{constant}$ for isothermal expansion
 $\therefore \log P = -\gamma \log V$ slope = $-\gamma$
 $\log P = -\log V$ slope = -1
- 6 (c)
A part of heat is used in dissociation of CH_3COOH , a weak acid.
- 7 (a)
No doubt solidification shows a decrease in entropy but in egg proteins structure are disordered in solid state due to denaturation.
- 8 (a)
 $1 \text{ cal} = 4.18 \text{ J} = 4.18 \times 10^7 \text{ erg} = \frac{4.18}{1.602} \times 10^{19} \text{ eV}$

9

(c)

$$\therefore 44 \text{ g of CO}_2 \text{ formed by which heat released} = -393.5 \text{ kJ}$$

$$\therefore 1 \text{ g of CO}_2 \text{ formed by which heat released} = \frac{-393.5}{44}$$

$$\therefore 35.2 \text{ g (given) of CO}_2 \text{ formed by which heat released} \\ = -\frac{393.5}{44} \times 35.2 = -314.8 \text{ kJ}$$

10

(b)

Only work can be done by a thermally isolated system between it and surroundings.

11

(c)

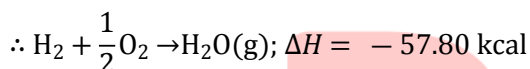
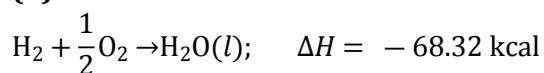
An open system is one which involves exchange of mass and energy.

13

(c)

Gaseous molecules have more random motion.

14

(d)

15

(c)

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

$$\Delta G = 0, \therefore \Delta H = T\Delta S$$

$$T = \frac{\Delta H}{\Delta S} = \frac{40.63 \times 10^3}{108.8} = 373.4 \text{ K}$$

16

(b)

No exchange of heat in between system and surroundings under adiabatic conditions.

17

(b)

More is heat of ionization of acid more is stability of acid or lesser is dissociation or $K_{\text{aCH}_3\text{COOH}} > K_{\text{aHCN}}$. Thus, $pK_{\text{aHCN}} > pK_{\text{aCH}_3\text{COOH}}$

18

(a)

Bond breaking process or decomposition processes are endothermic process.

19

(a)

Hess's law states that enthalpy changes during and process are independent of path. So, this law is used in calculating enthalpy.

20

(d)

$$\Delta G = \Delta H - T\Delta S; \Delta G = \Delta E + p\Delta V - T\Delta S$$

For spontaneity $\Delta G = -ve$

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

PE