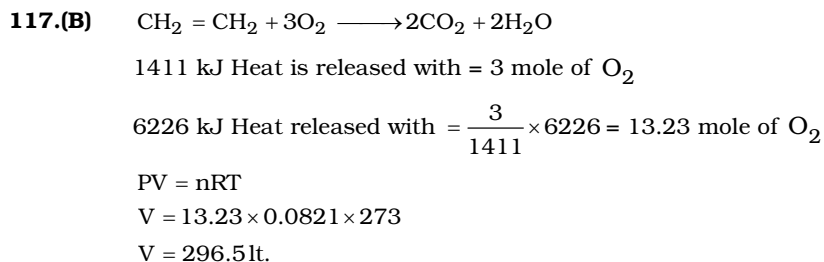
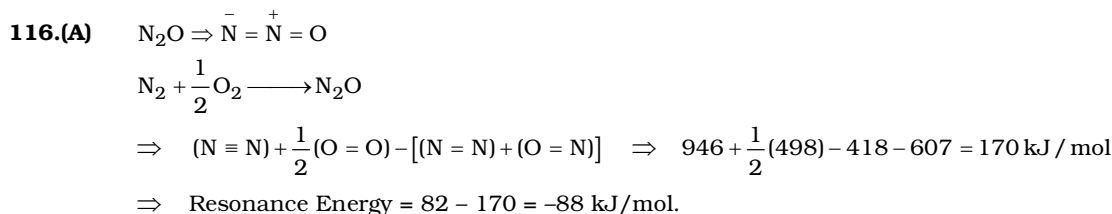
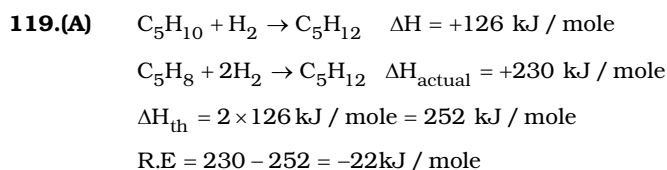


Daily Tutorial Sheet-10

Level-2



118.(ABC) By definition



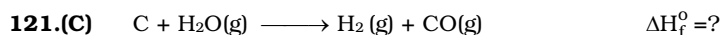
120.(B) Applying $PV = nRT$ for gaseous mixture

$$\left(\frac{740}{760}\right) \times 1 = n \times 0.082 \times 298 \Rightarrow n = 0.0398$$

Heat generated = Heat capacity \times Temperature rise = $1260 \times 0.667 = 840 \text{ cal}$

$$\text{Mole of } \text{CH}_4 \text{ in the mixture} = \frac{840}{210.8 \times 10^3} = 3.98 \times 10^{-3}$$

$$\text{Mole per cent of } \text{CH}_4 = \frac{3.98 \times 10^{-3}}{0.398} \times 100 = 10$$



$$\therefore \Delta H^\circ = \Delta_f H_{\text{CO}}^\circ - \Delta_f H_{\text{H}_2\text{O}}^\circ = -110.53 - (-241.81) = 131.28 \text{ kJ/mol} (\because \Delta_f H^\circ \text{ for C and H}_2 \text{ are zero})$$

$$\text{Thus, } \Delta H^\circ \text{ needed for 100 g carbon} = \frac{131.28 \times 100}{12} \text{ kJ}$$

Now, 393.51 kJ energy is provided by 12 g C

$$\frac{131.28 \times 100}{12} \text{ kJ energy is provided by} = \frac{12 \times 131.28 \times 100}{12 \times 393.51} = 33.36 \text{ g}$$

122.(A) Meq. of acid and base = 200

i.e. 200 Meq. of HCl react with 200 Meq. of NaOH to produce heat = ΔH

$$\therefore 1000 \text{ Meq. of HCl when react with 1000 Meq. of NaOH will give heat}$$

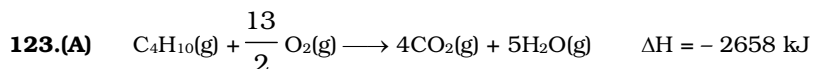
$$= 5 \times \Delta H = \text{Heat of neutralization}$$

Now, heat produced during neutralisation of 200 Meq. of acid and base

$$= \text{heat taken up by calorimeter} + \text{solution} = M_1 \times S_1 \Delta T + M_2 \times S_2 \Delta T$$

$$= 12 \times 1 \times 4.4 + 600 \times 1 \times 4.4 = 2692.8 \text{ cal}$$

$$\therefore \text{Heat of neutralization} = 5 \times 2692.8 \text{ cal} = -13.464 \text{ kcals}$$



Molecular weight of $\text{C}_4\text{H}_{10} = 58 \text{ g/mole}$

58 g of butane on combustion produces 2658 kJ heat

$$\therefore 11.2 \text{ kg of butane on combustion produces } \frac{2658 \times 10^3 \times 11.2}{58} \text{ J}$$

Family needs 20,000 kJ of energy per day

$$\therefore \text{Number of days} = \frac{2658 \times 10^3 \times 11.2}{58 \times 20,000} = 25.66 \text{ days}$$

124.(B) Total energy required in the day = $\frac{150 \times 24 \times 60 \times 60}{1000} \text{ kJ} = 12960 \text{ kJ} \quad [\because \text{Watt} = \text{Jsec}^{-1}]$

$$\text{Units of glycogen required} = \frac{12960}{476} = 27.22 \text{ units}$$

- 125.(A)**
- In, endothermic reaction, on increasing T, reaction moves in forward direction.
 - There is no effect of addition of solid component on equilibrium.
 - On adding NH_4OH , NH_4^+ concentration increases, due to which reaction moves to left side.