

Daily Tutorial Sheet-11

Numerical Value Type

126.(7.43)
$$\Delta H - \Delta U = \Delta nRT = 3 \times 8.314 \times 298 = -7432 J = -7.43 kJ$$

127.(5) Now, heat evolved during neutralization of 10 mL of each acid and base is twice the heat evolved during neutralization of 5 mL of each acid and base but the quantity of solution taking heat is also doubled thus, same temperature rise is noticed.

128.(104)
$$2H_2 \longrightarrow 4H$$
; $\Delta H = 208 \text{ kcal}$

$$H-H\longrightarrow 2H$$
; $\Delta H = \frac{208}{2}$ kcal

129.(4)
$$Cu(g) \longrightarrow Cu^{+}(g) + e; \Delta H = 745 \text{ kJ mol}^{-1}$$

$$I(g) + e \longrightarrow I^{-}(g); \quad \Delta H = -295 \text{ kJ mol}^{-1}$$

Adding
$$Cu^+(g) + I^-(g) \longrightarrow CuI(g)$$
; $\Delta H^\circ = -446 \text{ kJ mol}^{-1}$

$$Cu(g) + I(g) \longrightarrow CuI(g); \Delta H^{\circ} = 4 \text{ kJ mol}^{-1}$$

130.(14)
$$\frac{1}{2}$$
N₂ + O₂ \longrightarrow NO₂; $\Delta H = 8$ kcal (i

$$N_2 + 2O_2 \longrightarrow N_2O_4$$
; $\Delta H = 2 \text{ kcal}$ (ii)

By equation (i) $\times 2$ – (ii)

$$2NO_2 \longrightarrow N_2O_4$$
; $\Delta H = -14.0 \text{ kcal}$

131.(400)
$$\in_{A-A} = x \in_{A-B} = x \in_{B-B} = x/2$$

$$\frac{1}{2}\mathbf{A}_2 + \frac{1}{2}\mathbf{B}_2 \to \mathbf{A}\mathbf{B}$$

$$\frac{1}{2}x + \frac{x}{4} - x = -100 \quad \Rightarrow \quad x = 400$$

132.(550)
$$\Delta H = -2 \times \left[2 \times \in_{O-H}\right] + 2 \times \in_{H-H} + \in_{O=O} = -4 \times 220 + 2 \times 105 + 120 = -550 \text{kJ}$$

133.(10)
$$\Delta H = \frac{2.5 \times 16}{4} = -10 \text{ kcal mol}^{-1}$$

134.(196) By equation (i) + (ii).

$$2Na + Cl_2 \longrightarrow 2NaCl; \Delta H = -196 kcal$$

135.(17)
$$\Delta H = (\Delta H_{comb}CH_4) - [\Delta H_{comb}C(s) + 2 \times \Delta H_{comb}H_2(g)] = 17 \text{ cal}$$

$$\textbf{136.(93)} \qquad \Delta H = -2 \Big[3 \times \in_{N-H} \Big] + \in_{N \,\equiv\, N} \\ + 3 \times \in_{H-H} \\ = -2 \times 3 \times 391 + 945 + 436 \times 3 \\ = -93 \text{kJ}$$

137.(427)
$$\Delta H = -2 \in_{H-Cl} + \in_{H-H} + \in_{Cl-Cl}$$

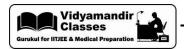
$$-182 = -2 \times a + 430 + 242$$

$$a = 427 \, \text{kJ} \, \text{mol}^{-1}$$

138.(11.4) 0.2 mole of HNO₃ is neutralized by 0.2 mole of NaOH to give heat $= 57 \times 0.2 = 11.4 \text{ kJ}$

139.(–2.7)
$$\Delta n = 2 - 0 = 2$$

$$\Delta H = \Delta U + \Delta n(g)RT = 2100 + \left(\frac{2 \times 300 \times 8.314}{4.18}\right) \quad \Rightarrow \quad \Delta G = \Delta H - T\Delta S$$



140.(314.8)
$$C(s) + O_2(g) \longrightarrow CO_2(g), \qquad \Delta H = -393.5 \text{ kJ mol}^{-1}$$

44 g CO_2 is formed then heat released is = 393.5 kJ mol^{-1}

35.2 g
$$\text{CO}_2$$
 is formed then heat released = $\frac{393.5 \times 35.2}{44} \, \text{kJ} = 314.8 \, \text{kJ}$

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