

Daily Tutorial Sheet-14

Level-3

153.(B) For adiabatic reversible process, $P_1 V_1^\gamma = P_2 V_2^\gamma$

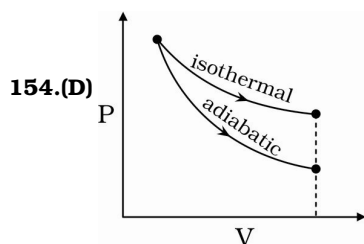
$$V_2 = V_1 \left(\frac{P_1}{P_2} \right)^{1/\gamma}$$

Since $\frac{P_1}{P_2} < 1 \Rightarrow V_2$ is greater for higher value of γ

For SO_2 , $\gamma = 1.33$

For N_2O , $\gamma = 1.4$ (linear)

For He, $\gamma = 1.66$



$$\therefore |W|_{\text{iso}} > |W|_{\text{adia}}, q_{\text{adiabatic}} = 0$$

$$\Rightarrow (P_2)_{\text{iso}} > (P_2)_{\text{adia}} \therefore |q_{\text{iso}}| > |q_{\text{adia}}|$$

$$\Rightarrow (T_2)_{\text{iso}} > (T_2)_{\text{adia}}$$

155.(C) (A) Pressure constant

(B) Volume constant

(C) Temperature constant so graph will be rectangular hyperbola

156.(D) $P_1 V_1^\gamma = P_2 V_2^\gamma$

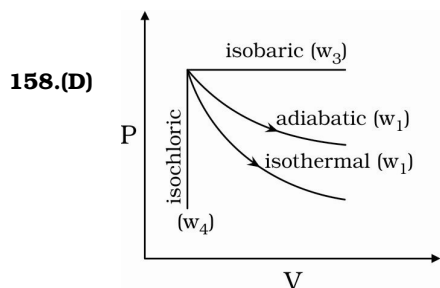
157.(B) $\text{C(s)} + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$

$$\Delta_f H = -94 \text{ kcal/mol}$$

$$\therefore \text{Heat evolved for 6 gm carbon} = 94 \times \frac{1}{2} = 47 \text{ kcal}$$

$$\therefore \text{Heat used to heat water} = \frac{50}{100} \times 47 = 23.5 \text{ kcal}$$

$$\therefore \text{Moles of water vapourized} = \frac{23.5}{9.6} = 2.44 \text{ mole}$$



$$\therefore |w_3| > |w_1| > |w_2| > |w_4|$$

$$\therefore w_3 < w_1 < w_2 < w_4$$