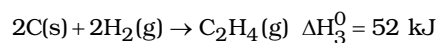
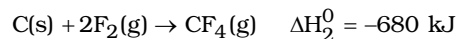
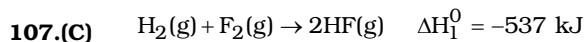


Daily Tutorial Sheet-9

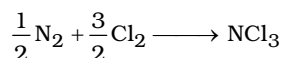
Level-2

106.(B) ΔH is negative when energy releases. During hydrogenation energy releases.

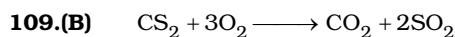


$\Delta H^\circ = -52 + 2 \times -680 + 2 \times -537 = -2486 \text{ kJ}$

108.(B) Heat of formation of NCl_3



On adding $\Delta H_1 + \frac{\Delta H_2}{2} - \frac{3\Delta H_3}{2}$, we get the answer



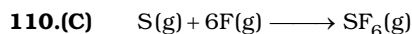
0.2 mole of $CS_2 = 215 \text{ kJ}$ of heat

1 mole of $CS_2 = \frac{215}{0.2} = 1075 \text{ kJ}$ of heat

$\Delta H_{\text{comb}} = 2\Delta H_f(SO_2) + \Delta H_f(CO_2) - \Delta H_f(CS_2)$

$1075 = 2(-296.8) + (-393.5) - \Delta H_f(CS_2)$

$\Delta H_f(CS_2) = 2(-296.8) + (-393.5) - 1075 = 87.9 \text{ kJ/mol}$

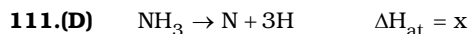


$\Delta H_f(s) + 6\Delta H_f(F) - 6(S-F) \text{ B.D} = \Delta H_f(SF_6)$

$275 + (6 \times 80) - 6(S-F) = -1100$

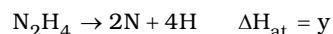
$275 + 480 + 1100 = 6(S-F)$

$\frac{1855}{6} = (S-F) = 309 \text{ kJ/mol}$



$x = \text{B.D of } 3(N-H)$

$(N-H) = \frac{x}{3} \quad \dots(1)$

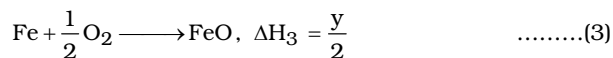
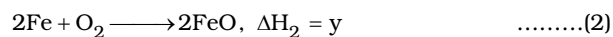
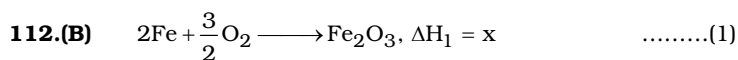


$1(N-N) + 4(N-H) = y$

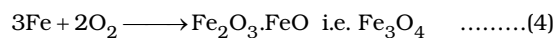
$(N-N) + 4\left(\frac{x}{3}\right) = y$

$(N-N) = y - \frac{4}{3}x$

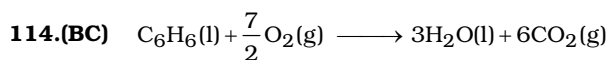
$(N-N) = \frac{3y - 4x}{3} \text{ kcal/mol}$



Equation (1) + Equation (3)

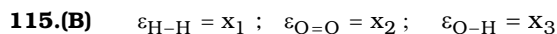


$$\Delta H = x + \frac{y}{2} = \frac{2x + y}{2}$$

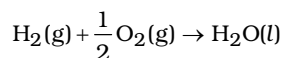


78 g of C_6H_6 release = 781 kcal/mol

$$156 \text{ g of } \text{C}_6\text{H}_6 \text{ release} = \frac{781}{78} \times 156 = 1562 \text{ kcal/mol} = 6528.2 \text{ kJ/mol}$$



$$\Delta_{\text{vap}} H_{(\text{H}_2\text{O})}^\ominus = x_4$$



$$\Delta_{\text{C}} H^\ominus = \epsilon_{\text{H-H}} + \frac{\epsilon_{\text{O=O}}}{2} - 2 \times \epsilon_{\text{O-H}} - \Delta_{\text{vap}} H^\ominus = x_1 + \frac{x_2}{2} - 2x_3 - x_4$$