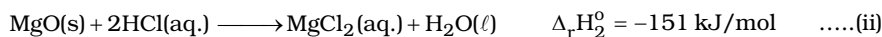
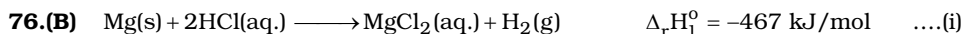


Daily Tutorial Sheet-6

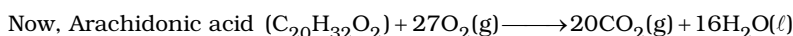
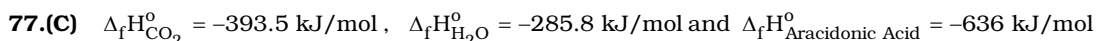
Level-2



Operate (i) – (ii) :

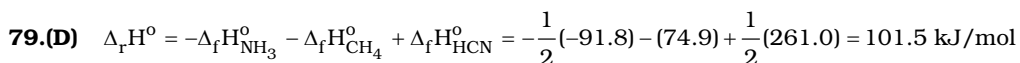
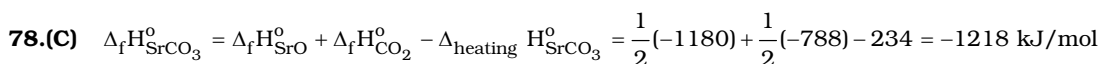


$\Rightarrow -316 = [\Delta_f H^\circ_{\text{MgO}} + 0] - [0 + \Delta_f H^\circ_{\text{H}_2\text{O}}] \Rightarrow -316 + (-286) = \Delta_f H^\circ_{\text{MgO}} = -602 \text{ kJ/mol}$



$\Rightarrow \Delta_c H^\circ = 20(-393.5) + 16(-285.8) - (-636) = -11.81 \text{ MJ/mol}$

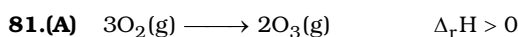
$\Rightarrow \text{mass required} = \left[\frac{500 \times 4.18 \times (25 - 5) \times 10^3 \text{ J}}{11.81 \times 10^6} \right] \times 304 \text{ gm} = 1.08 \text{ kg}$



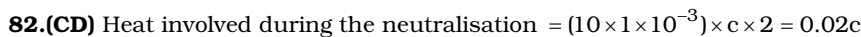
[Meq. H_2O formed = 0.5×35]

\Rightarrow Heat Liberated due to neutralisation = Heat gained by the system

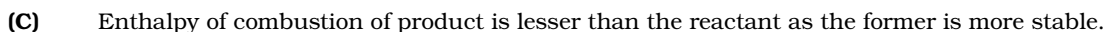
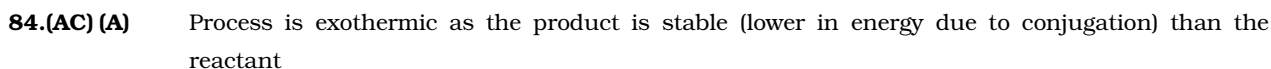
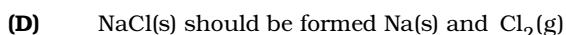
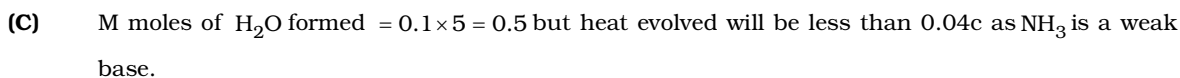
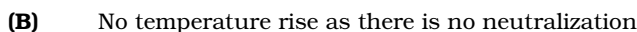
$\Rightarrow 980 = (60 \times 1) \times 4.18 \times (T - 25)$ [\because Total volume of solution = 60 ml] $\Rightarrow T = 28.9^\circ\text{C}$



\Rightarrow Energy required to break 3 moles of O_2 molecules is greater than energy liberated due to the formation of 2 moles of O_3 molecules. Thus, $\text{O} = \text{O}$ bond in O_2 is stronger than $\text{O} = \text{O}$ bond in O_3 .



0.02c heat is evolved due to the neutralization or formulation of $(0.1 \times 5) = 0.5 \text{ m moles of } \text{H}_2\text{O}$.



85.(AB) (A) $\Delta_r H^\circ = 2(-1263) - (-285) - (-2238) = -3 \Rightarrow$ Reaction is slightly exothermic

(B) $C_{12}H_{22}O_{11}(aq) + 12O_2(g) \longrightarrow 12CO_2(g) + 11H_2O(l) \quad \Delta_c H_1^\circ$

$2C_6H_{12}O_6(aq.) + 12O_2(g) \longrightarrow 12CO_2(g) + 12H_2O(l) \quad \Delta_c H_2^\circ$

$\Delta_c H_1^\circ = 2(x) + 11(-285) - (-285) - (-2238) = 12x - 897$ and

$\Delta_c H_2^\circ = 2(x) + 12(-285) - 2(-1263) = 12x - 894$

Clearly: $\Delta_c H_1^\circ > \Delta_c H_2^\circ$ [as x will be negative]

(C) Increasing T will shift the reaction in backward direction. So, 'h' of α - maltose will decrease with temperature.

(D) $\Delta_r H^\circ$ will change if solid α - maltose is taken instead of aq.