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CHEM 141 - CH 6 - ASSIGNMENT

① -150 J.

②  $7.82 \times 10^3 \text{ J/}^\circ\text{C}$

④ 222 kJ/mol

⑥ 107 kJ/mol

⑦ 52.8 L

⑧ 125 kJ

⑩ -372 kJ

⑪ -1188 kJ

⑫ -453 J

⑬ T.

⑭ F.

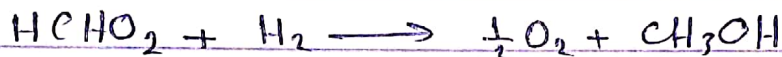
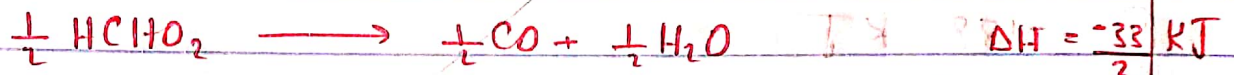
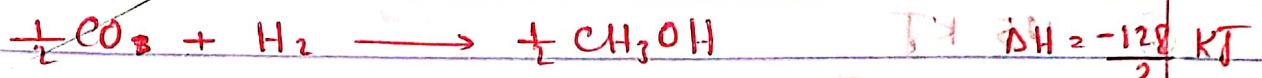
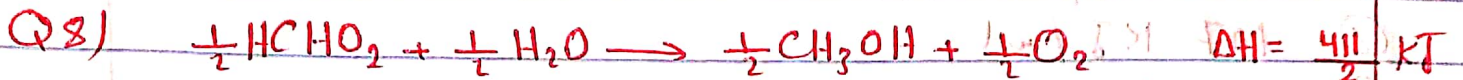
⑮ T.

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Q1)  $q = -575 \text{ J} \quad / \quad w = +425 \text{ J}$

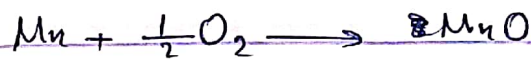
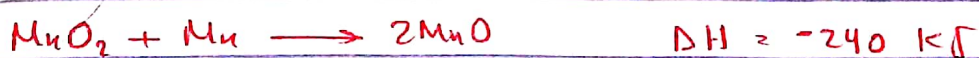
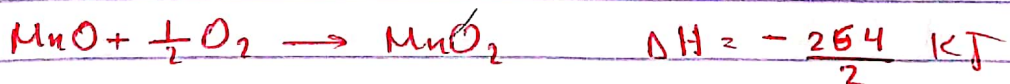
$$\Delta E = q + w$$

$$= (-575 \text{ J}) + (+425 \text{ J}) = \boxed{-150 \text{ J}}$$



$$\Delta H = \left(\frac{411}{2}\right) \text{ kJ} + \left(\frac{-28}{2}\right) \text{ kJ} + \left(\frac{-33}{2}\right) \text{ kJ} = \boxed{125 \text{ kJ}}$$

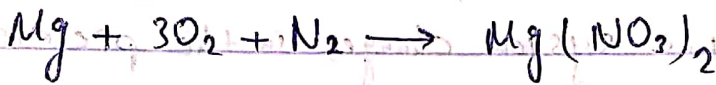
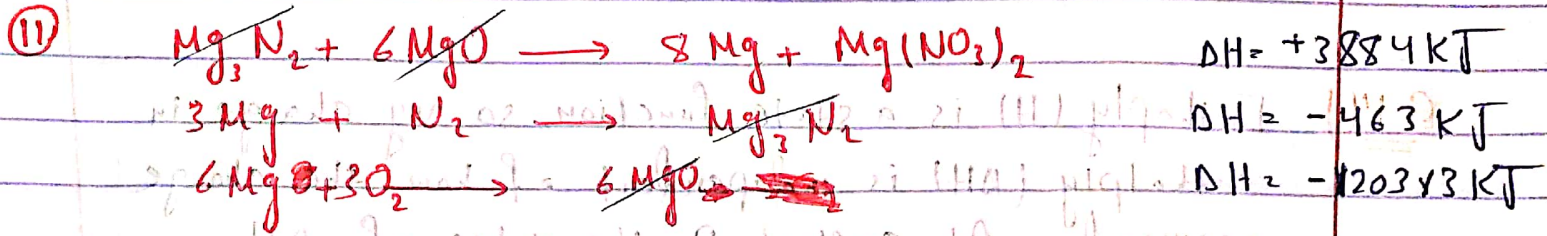
Q10)



$$\Delta H_f^\circ(\text{MnO}) = \left(\frac{-264}{2}\right) \text{ kJ} + (-240 \text{ kJ})$$

$$= \boxed{-372 \text{ kJ}}$$

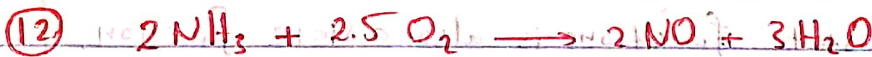




$\Delta H$  of  $Mg(NO_3)_2$  :-

$$+3884 \text{ KJ} + (-463) \text{ KJ} + (-1203 \times 3) \text{ KJ}$$

$$= -188 \text{ KJ}$$



$$\Delta H = 2 \times \Delta H[NO] + 3 \times \Delta H[H_2O] - 2 \times \Delta H[NH_3] + 5 \times \Delta H[H_2O]$$

$$= 2(90.3) \frac{\text{KJ}}{\text{mol}} + 3(-241.8) \frac{\text{KJ}}{\text{mol}} - 2(45.9) \frac{\text{KJ}}{\text{mol}}$$

$$= -453 \text{ KJ}$$

Q 14) - Enthalpy (H) is a state function, so any change in enthalpy ( $\Delta H$ ) is independent of how the change occurred. At constant P, the value of  $\Delta H$  equals  $\Delta E + PV$  work, which occurs when the volume of the system changes in the presence of an external pressure.

Q 16) - Enthalpy is a state function because it is defined in terms of state functions, U, P, and V are all state functions, their values depend only on the state of the system and not the paths taken to reach their values. A linear combination of state functions is also a state function.

$$\Delta H_1 = \sum \Delta H_f^\circ (\text{react})$$

$$\Delta H_2 = \sum \Delta H_f^\circ (\text{product})$$

$$\Delta H_{rxn} = \Delta H_1 + \Delta H_2 = \sum \Delta H_f^\circ (\text{product}) - \sum \Delta H_f^\circ (\text{react})$$