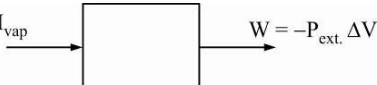


- 76.(BCD)** (A) Expansion of an ideal gas against vacuum is an irreversible process.
(B) Spontaneous process is always irreversible.
(C) As per definition of reversible process.
(D) If expansion is carried out reversibly, system will do work and hence, it will absorb more heat from the surroundings.
- 77.** [A : 1, 2] ; [B : 3] ; [C : 1, 2, 3] ; [D : 4]
(A) For isothermal process : $\Delta U = \Delta H = 0$
(B) For reversible adiabatic process : $\Delta S = 0$
(C) For cyclic process : $\Delta U = \Delta H = \Delta S = 0$
(D) For isochoric process : $w = 0$
- 78.(C)** $W_{\text{irr}} = -P_{\text{ext}}(V_2 - V_1)$
 $W = -1(20 - 10) = -10 \text{ dm}^3 \text{ atm} = -10 \text{ dm}^3 \times \frac{8.314 \text{ JK}^{-1} \text{ mol}^{-1}}{0.0821 \text{ dm}^3 \text{ K}^{-1} \text{ mol}^{-1}} = -1013 \text{ J}$
From, 1st w of thermodynamics $\Delta U = q + W = 800 \text{ J} + (-1013 \text{ J}) = -213 \text{ J}$
- 79.(D)** In neutralization reaction, when acid and base both are weak, a large amount of heat is utilized to ionise them. Thus, for such reactions, enthalpy of the reaction is least.
Hence, enthalpy is least for $\text{HCN} + \text{NH}_4\text{OH} \longrightarrow \text{NH}_4\text{CN} + \text{H}_2\text{O}$
- 80.(B)** $\Delta S = 16 \text{ J mol}^{-1} \text{ K}^{-1}$, $\Delta H_v = 6 \text{ kJ mol}^{-1}$
 $T_{\text{bp}} = \frac{\Delta H_{\text{vapour}}}{\Delta S_{\text{vapour}}} = \frac{6 \times 1000}{16} = 375 \text{ K}$
- 81.(A)** In bomb calorimeter, volume is constant, so, $w = 0$ and $\Delta U = q$.
Since q is calculated by the change in temperature of calorimeter, we have to notice the sign of ΔU .
For exothermic ΔU is negative and for endothermic ΔU is +ve.
- 82.(D)** $q = \Delta H_{\text{vap}}$ 
 $\Delta U = q + W = 41000 - 1 \times 10^5 \times \left(\frac{1 \times 8.314 \times 373}{1 \times 10^5} - 0 \right) = (41000 - 3101.122) \text{ J} = 37.9 \text{ kJ}$
- 83.(B)** $W = -P_{\text{ext}}(V_2 - V_1) = -3 \times 2 = -6 \text{ lt-atm} = -6 \times 101.3 = -607.8 \text{ J}$
 $\therefore 607.8 = ms\Delta T$
 $\Rightarrow 607.8 = 10 \times 18 \times 4.18 \times \Delta T$
 $\Delta T = 0.8 \Rightarrow T_2 = 290.8 \text{ K}$
- 84.(BCD)** $\frac{P}{Q}$, PQ , $\frac{dP}{dQ}$ are intensive properties
- 85.(AB)** For isothermal and cyclic process, $\Delta E = 0$