Date Planned : __ / __ / __	Daily Tutorial Sheet-14	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-3	Exact Duration :_____

The total heat content of a system at constant pressure is known as it enthalpy. Mathematically it is the sum of internal energy and pressure volume energy H = E + PV. When the initial state of a system changes to final state reversibly at constant pressure the change in enthalpy (ΔH) and change in Internal energy (ΔE) are related by:

$\Delta H = \Delta E + P\Delta V$

$\Delta H = \Delta E + \Delta nRT$

Δn = Number of moles of gaseous products – Number of moles of gaseous reactants.

For the reactions involving only solids and liquids i.e., $\Delta n_g = 0$

$\Delta H \cong \Delta E$

153. For the reaction $2CO(g) + O_2(g) \longrightarrow 2CO_2(g), \Delta H = -56$ kJ / mol .

In one litre vessel at 500 K the initial pressure is 70 atm and after the reaction it becomes 40 atm at constant volume of one litre. The change in internal energy would be :

(A) –70 kJ / mol **(B)** –40 kJ / mol

(C) –53 kJ / mol **(D)** –80 kJ / mol

154. The enthalpy of fusion of ice is 6.0 kJ/mol. The heat capacity of water is $4.2 Jg^{-1}c^{-1}$. What is the smallest number of ice cubes at 0°C each containing one mole of water that are needed to cool 500 g of liquid water from 20°C to 0°C ?

(A) 1 **(B)** 7 **(C)** 14 **(D)** 125

155. 5 moles of an ideal gas is expanded isothermally and reversibly from 1 litre to 100 litre at 300 K. The enthalpy change for the process is:

(A) 11.4 kJ **(B)** –11.4 kJ

(C) 0 kJ **(D)** 4.8 kJ

156. Calculate difference between ΔH and ΔU when 1 mole of grey tin (density = 5.75 g/cm^3) changes to white tin (density = 7.13 g/cm^3) at 10 bar. (at 298 k, $\Delta H = +2.1$ kJ, at wt = 119 of Sn)

(A) –8.8 J **(B)** –4.4 J

(C) –2.2 J **(D)** 4.4 J

157. $\Delta_f H^\theta$ of hypothetical MgCl is -125 kJ mol^{-1} and for $MgCl_2$ is -642 kJ mol^{-1}. The enthalpy of disproportionation of $-49x$. Find the value of x.

158. The enthalpy of solution of NaOH(s) in water is –41.6 kJ / mole . When NaOH is dissolved in water then the temperature of water :

(A) Decrease **(B)** Increase

(C) Does not change **(D)** Fluctuates