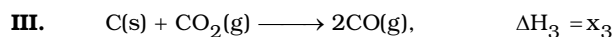
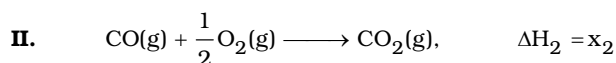
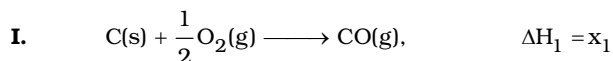


Date Planned : __ / __ / __	Daily Tutorial Sheet-5	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration : _____

61. The heat of combustion of sucrose ($C_{12}H_{22}O_{11}$) is 1350 kcal/mol. How much of heat will be liberated when 161 g of sucrose is burnt ?
- (A) 26.8 kcal (B) 57.63 kcal
(C) 635.5 kcal (D) 52.87 kcal
62. Consider the following reactions.
- I. $C(\text{graphite}) + O_2(g) \longrightarrow CO_2(g); \Delta H^\circ = -x_1 \text{ cal}$
- II. $CO(g) + \frac{1}{2}O_2(g) \longrightarrow CO_2(g); \Delta H^\circ = -x_2 \text{ cal}$
- Based on the above data, $\Delta H_f^\circ(CO_2)$ is :
- (A) $-x_1 \text{ cal}$ (B) $-x_2 \text{ cal}$
(C) $(x_2 - x_1) \text{ cal}$ (D) $(x_1 - x_2) \text{ cal}$
63. From Q.(62) above, $\Delta H_f^\circ(CO)$ is:
- (A) $-x_1$ (B) $-x_2$ (C) $x_2 - x_1$ (D) $x_1 - x_2$
64. Consider the following reactions,
- I. $N_2 + O_2 \longrightarrow 2NO, \Delta H = x_1$ II. $2CO + O_2 \longrightarrow 2CO_2, \Delta H = x_2$
 III. $2H_2O + O_2 \longrightarrow 2H_2O_2, \Delta H = x_3$ IV. $PCl_3 + Cl_2 \longrightarrow PCl_5, \Delta H = x_4$
- In which case(s), $\Delta H_f = \frac{\Delta H}{2}$?
- (A) I, II, III (B) IV (C) II, III (D) I
65. Heat of reaction $A(s) + B(g) \longrightarrow 2C(g)$ is 40 kJ at 300 K and constant volume. Hence, heat of reaction at constant pressure and at 300 K is,
- (A) 42.5 kJ (B) 37.5 kJ
(C) 40.0 kJ (D) 30.0 kJ
66. Heat of combustion of CH_4 , C_2H_6 and C_3H_8 are respectively -210 , -368.4 and $-526.3 \text{ kcal mol}^{-1}$. Hence, heat of combustion of C_6H_{14} is approximately.
- (A) $-1310 \text{ kcal mol}^{-1}$ (B) $-684 \text{ kcal mol}^{-1}$
(C) $-840 \text{ kcal mol}^{-1}$ (D) $-1000 \text{ kcal mol}^{-1}$
67. Calorific value of H_2 is -143 kJ g^{-1} . Hence, ΔH_f° of H_2O is:
- (A) -143 kJ mol^{-1} (B) -286 kJ mol^{-1}
(C) $+143 \text{ kJ mol}^{-1}$ (D) $+286 \text{ kJ mol}^{-1}$

68. Consider the following reactions,



Select the correct statements:

(A) Heat of formation of CO_2 is $(x_1 + x_2)$

(B) Heat of combustion of C is $(x_1 + x_2)$

(C) $\Delta H_3 = \Delta H_1 - \Delta H_2$

(D) All of the above are correct statement(s)

69. The dissolution of $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ in large volume of water is endothermic to the extent of $3.5 \text{ kcal mol}^{-1}$.



Hence, heat of solution of CaCl_2 (anhydrous) in a large volume of water is:

(A) 26.7 kcal

(B) -26.7 kcal

(C) 19.7 kcal

(D) -19.7 kcal

70. Lattice energy of NaCl(s) is 788 kJ mol^{-1} and enthalpy of hydration is -784 kJ mol^{-1} . Hence, heat of solution of NaCl(s) is: 

(A) 4 kJ mol^{-1}

(B) -4 kJ mol^{-1}

(C) $-1572 \text{ kJ mol}^{-1}$

(D) 1572 kJ mol^{-1}

71. Bond energies of $\text{N} \equiv \text{N}$ bond, $\text{H}-\text{H}$ bond and $\text{N}-\text{H}$ bond are respectively x_1 , x_2 and $x_3 \text{ kJ mol}^{-1}$.

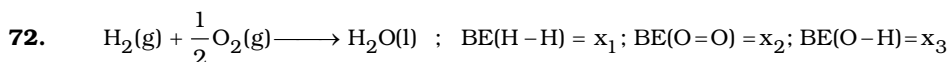
Hence, $\Delta H_f^\circ(\text{NH}_3)$ is: 

(A) $x_1 + 3x_2 - x_3$

(B) $x_1 + x_2 - x_3$

(C) $\frac{x_1}{2} + \frac{3}{2}x_2 - 3x_3$

(D) $x_1 + 3x_2 - 6x_3$



Latent heat of vaporization of liquid water into water vapour = x_4 then ΔH_f (heat of formation of liquid water) is:

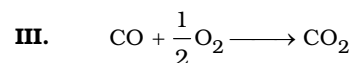
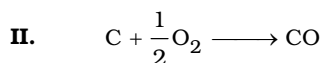
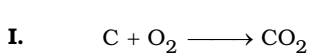
(A) $x_1 + \frac{x_2}{2} - x_3 + x_4$

(B) $2x_3 - x_1 - \frac{x_2}{2} - x_4$

(C) $x_1 + \frac{x_2}{2} - 2x_3 - x_4$

(D) $x_1 + \frac{x_2}{2} - 2x_3 + x_4$

73. Which combination of the following equations have enthalpy changes equal to $\Delta H_{\text{comb}}(\text{C})$? 



(A) I, II

(B) I, II, III

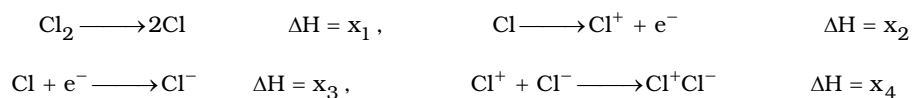
(C) I, III

(D) I

74. The heat of atomisation of $\text{PH}_3(\text{g})$ and $\text{P}_2\text{H}_4(\text{g})$ are 953 kJ mol^{-1} and 1485 kJ mol^{-1} respectively. The P - P bond energy in kJ mol^{-1} is: ▶

- | | |
|----------------------------------|-----------------------------------|
| (A) 213
(C) 318 | (B) 426
(D) 1272 |
|----------------------------------|-----------------------------------|

75. An imaginary lattice $\text{Cl}^+ \text{Cl}^-$ is formed as given ▶



Thus, enthalpy change when $\text{Cl}^+ \text{Cl}^-$ is formed is:

- | | |
|--|---|
| (A) $\left(+\frac{x_1}{2} + x_2 + x_3 + x_4 \right)$
(C) $(x_1 + x_2 - x_3 - x_4)$ | (B) $\left(-\frac{x_1}{2} + x_2 + x_3 + x_4 \right)$
(D) $-(x_1 + x_2 + x_3 + x_4)$ |
|--|---|