

Date Planned : __ / __ / __	Daily Tutorial Sheet-4	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration : _____

46. Identify the reaction for which $\Delta H \neq \Delta E$
- (A) $\text{S(rhombic)} + \text{O}_2(\text{g}) \longrightarrow \text{SO}_2(\text{g})$ (B) $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{NO}(\text{g})$
- (C) $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \longrightarrow 2\text{HCl}(\text{g})$ (D) $\text{CO}(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$
47. Which of the following indicates the heat of reaction equal to heat of formation?
- (A) $\text{C(graphite)} + \text{O}_2(1 \text{ atm}) \longrightarrow \text{CO}_2(1 \text{ atm})$
- (B) $\text{C(diamond)} + \text{O}_2(1 \text{ atm}) \longrightarrow \text{CO}_2(2 \text{ atm})$
- (C) $\text{C(graphite)} + \text{O}_2(1 \text{ atm}) \longrightarrow \text{CO}_2(2 \text{ atm})$
- (D) $\text{C(diamond)} + \text{O}_2(1 \text{ atm}) \longrightarrow \text{CO}_2(1 \text{ atm})$
48. The H – H bond energy is 430 kJ mol^{-1} and Cl – Cl bond energy is 240 kJ mol^{-1} , ΔH_f for HCl is -90 kJ . The H – Cl bond energy is about :
- (A) 180 kJ mol^{-1} (B) 360 kJ mol^{-1}
- (C) 213 kJ mol^{-1} (D) 425 kJ mol^{-1}
49. If the bond dissociation energies of XY, X_2 and Y_2 (all diatomic molecules) are in the ratio of 1 : 1 : 0.5 and ΔH_f for the formation of XY is -200 kJ mol^{-1} . The bond dissociation energy of X_2 will be :
- (A) 400 kJ mol^{-1} (B) 300 kJ mol^{-1}
- (C) 20 kJ mol^{-1} (D) None of these
50. For the gaseous reaction involving the complete combustion of iso-butane :
- (A) $\Delta H = \Delta E$ (B) $\Delta H > \Delta E$ (C) $\Delta H < \Delta E$ (D) None of these
51. If $\text{S} + \text{O}_2 \longrightarrow \text{SO}_2$; $\Delta H = -298.2 \text{ kJ}$
- $\text{SO}_2 + \frac{1}{2}\text{O}_2 \longrightarrow \text{SO}_3$; $\Delta H = -98.7 \text{ kJ}$
- $\text{SO}_3 + \text{H}_2\text{O} \longrightarrow \text{H}_2\text{SO}_4$; $\Delta H = -130.2 \text{ kJ}$
- $\text{H}_2 + \frac{1}{2}\text{O}_2 \longrightarrow \text{H}_2\text{O}$; $\Delta H = -287.3 \text{ kJ}$
- Then the enthalpy of formation of H_2SO_4 at 298 K will be :
- (A) -814.4 kJ (B) $+320.5 \text{ kJ}$ (C) -650.3 kJ (D) -933.7 kJ
52. The enthalpies of formation of Al_2O_3 and Cr_2O_3 are -1596 kJ and -1134 kJ respectively. ΔH for the reaction, $2\text{Al} + \text{Cr}_2\text{O}_3 \longrightarrow 2\text{Cr} + \text{Al}_2\text{O}_3$ is :
- (A) -2730 kJ (B) -462 kJ (C) -1365 kJ (D) $+2730 \text{ kJ}$

53. Average C – H bond energy is 416 kJ mol^{-1} . Which of the following is correct?
- (A) $\text{CH}_4(\text{g}) + 416 \text{ kJ} \longrightarrow \text{C}(\text{g}) + 4\text{H}(\text{g})$
 (B) $\text{CH}_4(\text{g}) \longrightarrow \text{C}(\text{g}) + 4\text{H}(\text{g}) + 416 \text{ kJ}$
 (C) $\text{CH}_4(\text{g}) + 1664 \text{ kJ} \longrightarrow \text{C}(\text{g}) + 4\text{H}(\text{g})$
 (D) $\text{CH}_4(\text{g}) \longrightarrow \text{C}(\text{g}) + 4\text{H}(\text{g}) + 1664 \text{ kJ}$
54. For the reaction, $\text{A}(\text{s}) + 3\text{B}(\text{g}) \longrightarrow 4\text{C}(\text{g}) + \text{D}(\text{l})$ ΔH and ΔU are related as :
- (A) $\Delta H = \Delta U$ (B) $\Delta H = \Delta U + 3RT$
 (C) $\Delta H = \Delta U + RT$ (D) $\Delta H = \Delta U - 3RT$
55. For the gaseous reaction, $\text{N}_2\text{O}_4(\text{g}) \longrightarrow 2\text{NO}_2(\text{g})$
- (A) $\Delta H < \Delta E$ (B) $\Delta H = \Delta E$ (C) $\Delta H = 0$ (D) $\Delta H > \Delta E$
56. For the reaction, $\text{PCl}_5(\text{g}) \longrightarrow \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
- (A) $\Delta H = \Delta E$ (B) $\Delta H > \Delta E$ (C) $\Delta H < \Delta E$ (D) None of these
57. The enthalpy change (ΔH) for the process $\text{N}_2\text{H}_4(\text{g}) \longrightarrow 2\text{N}(\text{g}) + 4\text{H}(\text{g})$ is 1724 kJ mol^{-1} . If the bond energy of N – H bond in ammonia is 391 kJ mol^{-1} , what is the bond energy for N – N bond in N_2H_4 ?
- (A) 391 kJ mol^{-1} (B) 160 kJ mol^{-1} (C) 1173 kJ mol^{-1} (D) 320 kJ mol^{-1}
58. Factors that influence the heat of formation is(are) :
- I. The physical state of reactants and products
 II. The temperature
 III. The pressure or volume
 IV. The method by which the final products are obtained
- The correct option is :
- (A) I, II (B) II, III (C) I, II, III (D) IV
59. For the reaction, $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{H}_2\text{O}(\text{g})$; $\Delta H = -573.2 \text{ kJ}$
- The heat of decomposition of water per mole is :
- (A) 286.6 kJ (B) 573.2 kJ (C) -28.66 kJ (D) zero
60. The bond energy of O – H bond is 109 kcal/mol . When a mole of water vapour is formed from its gaseous atoms then :
- (A) 109 kcal is released (B) 218 kcal is absorbed
 (C) 109 kcal is absorbed (D) 218 kcal is released