Date Planned : __ / __ / __	Daily Tutorial Sheet-2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration :_____

16. 48 g of C(diamond) on complete combustion evolves 1584 kJ of heat. The standard heat of formation of gaseous carbon is 725 kJ/mol. The energy required for the process.

(i) C(graphite) $\rightarrow$ C(gas) (ii) C(diamond) $\rightarrow$ C(gas) are

Given : $C(\text{diamond}) \longrightarrow C(\text{graphite})$, $\Delta H = -2\text{kJ / mol}$

(A) 725, 727 **(B)** 727, 725 **(C)** 725, 723 **(D)** None of these

17. Which of the following does not represent heat of formation (ΔH_f°)?

(A) $C_{(\text{graphite})} + O_2(g) \longrightarrow CO_2(g)$ **(B)** $H_2(g) + \frac{1}{2}O_2(g) \longrightarrow H_2O(\ell)$

(C) $2CO(g) + O_2(g) \longrightarrow 2CO_2(g)$ **(D)** All of these

18. Heat of solution of $BaCl_2.2H_2O$ = 200 kJ/mol, Heat of hydration of $BaCl_2$ = –150 kJ/mol. Hence, heat of solution of $BaCl_2$ is:

(A) 350 kJ **(B)** 50 kJ **(C)** –350 kJ **(D)** None of these

19. The species which by definition has zero standard molar enthalpy of formation at 298 K is :

(A) CO_2 (g) **(B)** $H_2O(\ell)$ **(C)** O_2 (g) **(D)** P_4(red)

20. One gram of an organic liquid X (molecular mass 78) liberates 160 J of heat on solidification. $\Delta H_{\text{fusion}}(X)$ is :

(A) 19.2 kJ/mol **(B)** 12.48 kJ/mol

(C) 124.8 kJ/mol **(D)** None of these

21. Bond energies are equal to dissociation energies in case of :

(A) monoatomic molecules **(B)** polyatomic molecules

(C) diatomic molecules **(D)** all type of molecules

22. For the change, $C_{\text{diamond}} \longrightarrow C_{\text{graphite}}$; $\Delta H = -1.89\,\text{kJ}$, if 6 g of diamond and 6 g of graphite are separately burnt to yield CO_2 the heat liberated in first case is:

(A) Less than in the second case by 1.89 kJ

(B) Less than in the second case by 11.34 kJ

(C) Less than in the second case by 14.34 kJ

(D) More than in the second case by 0.945 kJ

23. Which of the following equations corresponds to the definition of enthalpy of formation at 298 K?

(A) $C(\text{graphite}) + 2H_2(g) + \frac{1}{2}O_2(\ell) \longrightarrow CH_3OH(g)$

(B) $C(\text{diamond}) + 2H_2(g) + \frac{1}{2}O_2(g) \longrightarrow CH_3OH(\ell)$

(C) $2C(\text{graphite}) + 4H_2(g) + O_2(g) \longrightarrow 2CH_3OH(\ell)$

(D) $C(\text{graphite}) + 2H_2(g) + \frac{1}{2}O_2(g) \longrightarrow CH_3OH(\ell)$

24. If $\Delta_f H^{\Theta}$ of ICl(g), Cl(g), and I(g) is 17.57, 121.34 and 106.96 J mol^{-1}, respectively. Then bond dissociation energy of I – Cl bond is:

(A) 35.15J mol^{-1} **(B)** 106.69 mol^{-1}

(C) 210.73 J mol^{-1} **(D)** 420.9 J mol^{-1}

25. Which of the following defines ΔH_f°?

(A) $CO(g) + \frac{1}{2}O_2(g) \longrightarrow CO_2(g)$ **(B)** $\frac{1}{2}H_2(g) + \frac{1}{2}F_2(g) \longrightarrow HF(g)$

(C) $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$ **(D)** $C_{(Diamond)} + O_2(g) \longrightarrow CO_2(g)$

26. The enthalpy of reaction,

$$H_2(g) + \frac{1}{2}O_2(g) \longrightarrow H_2O(g) \text{ is } \Delta H_1$$

and that of $H_2(g) + \frac{1}{2}O_2(g) \longrightarrow H_2O(l)$ is ΔH_2. Then:

(A) $\Delta H_1 < \Delta H_2$ **(B)** $\Delta H_1 + \Delta H_2 = 0$ **(C)** $\Delta H_1 > \Delta H_2$ **(D)** $\Delta H_1 = \Delta H_2$

27. The amount of energy released when 20 mL of 0.5 M NH_4OH are mixed with 100 mL of 0.1 M HCl is x kJ. The heat of dissociation of NH_4OH will be (heat of neutralization of NaOH & HCl is y kJ/mol).

(A) –100 x **(B)** y – 100 x **(C)** –100x – y **(D)** 100x

28. The heat of neutralization of any strong acid and a strong base is nearly equal to :

(A) –75.3kJ **(B)** + 57.3 kJ **(C)** –57.3 kJ **(D)** + 75.3 kJ

29. Enthalpy of formation of HF and HCl are –161 kJ and – 92 kJ respectively. Which of the following statements is incorrect?

(A) HCl is more stable than HF

(B) Formation of HF and HCl are exothermic reaction

(C) The affinity of fluorine to hydrogen is greater than the affinity of chlorine to hydrogen

(D) HF is more stable than HCl

30. Which of the following equations correctly represents the standard heat of formation (ΔH_f°) of methane?

(A) $C(diamond) + 4H(g) \longrightarrow CH_4(g)$ **(B)** $C(diamond) + 2H_2(g) \longrightarrow CH_4(g)$

(C) $C(graphite) + 2H_2(g) \longrightarrow CH_4(g)$ **(D)** $C(graphite) + 4H(g) \longrightarrow CH_4(g)$