Date Planned : __ / __ / __	Daily Tutorial Sheet-10	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-2	Exact Duration :_____

116. If an endothermic reaction is non-spontaneous at freezing point of water becomes feasible at its boiling point then :

(A) ΔH is $-$ve, ΔS is $+$ve **(B)** ΔH and ΔS both are $+$ve

(C) ΔH and ΔS both are $-$ve **(D)** ΔH is $+$ve, ΔS is $-$ve

117. Select the correct statement(s) about entropy S.

(A) $S_{(vapour)} > S_{(solid)} > S_{(liquid)}$ **(B)** $S_{(vapour)} > S_{(liquid)} > S_{(solid)}$

(C) $S_{(vapour)} < S_{(liquid)} < S_{(solid)}$ **(D)** $S_{(vapour)} = S_{(liquid)} > S_{(solid)}$

118. A particular reaction at 27°C for which $\Delta H > 0$ and $\Delta S > 0$ is found to be non-spontaneous. The reaction may proceed spontaneously if :

(A) The temperature is decreased **(B)** The temperature is kept constant

(C) The temperature is increased **(D)** It is carried in open vessel at 27°C

119. In the conversion of limestone to lime, $CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$ the values of ΔH° and ΔS° are $+179.1\ kJ\ mol^{-1}$ and $160.2\ J\ K^{-1}\ mol^{-1}$ respectively at 298 K and 1 bar. Assuming that, ΔH° and ΔS° do not change with the temperature above which conversation of limestone to lime will be spontaneous is:

(A) 1118 K **(B)** 1008 K

(C) 1200 K **(D)** 845 K

120. Standard entropy of X_2, Y_2 and XY_3 are 60, 40 and $50\ J\ K^{-1}\ mol^{-1}$ respectively. For the reaction : $\frac{1}{2}X_2 + \frac{3}{2}Y_2 \longrightarrow XY_3$, $\Delta H = -30\ kJ$ to be at equilibrium, the temperature will be :

(A) 1000 K **(B)** 1250 K

(C) 500 K **(D)** 750 K

121. The incorrect expression among the following is :

(A) $\frac{\Delta G_{System}}{\Delta S_{Total}} = -T$

(B) In isothermal process, $w_{(reversible)} = -nRT\ \ln\left(\frac{V_f}{V_i}\right)$

(C) $\ln K = \frac{\Delta H^\circ - T\Delta S^\circ}{RT}$

(D) $K = e^{-\Delta G^\circ/RT}$

122. A reaction has $\Delta H = -33\ kJ$ and $\Delta S = -58\ J/K$. This reaction would be :

(A) spontaneous at all temperatures

(B) non-spontaneous at all temperatures

(C) spontaneous above a certain temperature only

(D) spontaneous below a certain temperature only

123. Animals operate under conditions of constant pressure and most of the processes that maintain life are isothermal (in a broad sense). How much energy is available for sustaining this type of muscular and nervous activity from the combustion of 1 mol of glucose molecules under standard conditions at 37°C (blood temperature) ? The entropy change is + 182.4 JK^{-1} for the reaction stated above.

$\Delta H_{combustion}$[glucose] = – 2808 kJ

(A) –2754.4 kJ **(B)** –2864.5 kJ **(C)** –56.5 kJ **(D)** –2808 kJ

124. One gram sample of oxygen undergoes free expansion from 0.75 L to 3.0 L at 298 K. Calculate ΔS, q, w, ΔH and ΔE

(A) $\Delta S = 0.36\ JK^{-1}$ **(B)** W = 227.97 J

(C) q = – 227.97 J **(D)** ΔH = 107.28 J

125. Given that:

$\Delta G_f^o(CuO) = -30.4$ kcal/mole

$\Delta G_f^o(Cu_2O) = -34.98$ kcal/mole T = 298 K

Now on the basis of above data which of the following predictions will be most appropriate under the standard conditions and reversible reaction.

(A) Finely divided form of CuO kept in excess O_2 would be completely converted to Cu_2O

(B) Finely divided form of Cu_2O kept in excess O_2 would be completely converted to CuO

(C) Finely divided form of CuO kept in excess O_2 would be converted to a mixture of CuO and Cu_2O (having more of CuO)

(D) Finely divided form of CuO kept in excess O_2 would be converted to a mixture of CuO and Cu_2O (having more of Cu_2O)