DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth   SUBJECT : CHEMISTRY
DATE :   DPP No. : 1

Topic :- THERMODYNAMICS

1. Two mole of an ideal gas is expanded isothermally and reversibly from 1 L to 10 L at 300 K. The enthalpy change (in kJ) for the process is
    a) 11.4   b) -11.4 c) 0   d) 4.8

2. A gaseous system changes from state $A(P_1, V_1, T_1)$ to $B(P_2, V_2, T_2)$, B to $C(P_3, V_3, T_3)$ and finally from C to A. The whole process may be called:
    a) Reversible process   b) Cyclic process   c) Isobaric process   d) Spontaneous process

3. One mole of ice is converted into water at 273 K. The entropies of $H_2O(s)$ and $H_2O(l)$ are 38.20 and 60.01 J $mol^{-1}K^{-1}$ respectively. The enthalpy change for the conversion is:
    a) 59.54 J mol^{-1} b) 5954 J mol^{-1} c) 595.4 J mol^{-1} d) 320.6 J mol^{-1}

4. For a diatomic molecule AB, the electronegativity difference between A and $B = 0.2028\sqrt{\Delta}$. [Where $\Delta =$ bond energy of AB Geometric mean of the bond energies of A_2 and B_2]   The   electronegativities   of fluorine and chlorine are 4.0 and 3.0 respectively and the bond energies are of F $-$ F: 38 kcal mol^{-1} and Cl $-$ Cl : 58 kcal mol^{-1}. The bond energy of Cl $-$ F is :
    a) $\sim$ 71 kcal/mol   b) $\sim$ 61 kcal/mol   c) $\sim$ 48 kcal/mol   d) $\sim$ 75 kcal/mol

5. Any series of operation so carried out that at the end, the system is back to its state is called
    a) Boyle's cycle   b) Reversible process   c) Adiabatic process   d) Cyclic process

6. The heat of neutralisation of a strong acid and a strong alkali is 57.0 kJ mol^{-1}. The heat released when 0.5 mole of HNO_3 solution is mixed with 0.2 mole of KOH is
    a) 57.0 kJ   b) 11.4 kJ   c) 28.5 kJ   d) 34.9 kJ

7. The Kirchhoff's equation gives the effect of .....on heat of reaction.
    a) Pressure   b) Temperature   c) Volume   d) Molecularity

8. Δn values in $\Delta H = \Delta U + \Delta nRT$ may have:
    a) Integer nature   b) Fractional value   c) Positive or negative   d) All of these

9. AB, A_2 and B_2 are diatomic molecules. If the bond enthalpies of A_2, AB and B_2 are in the ratio 1:1:0.5 and the enthalpy of formation of AB from A_2 and B_2 is -100 kJ mol^{-1}, what is the bond enthalpy of A_2?
    a) 400 kJ mol^{-1} b) 200 kJ mol^{-1} c) 100 kJ mol^{-1} d) 300 kJ mol^{-1}

10. Which of the following is an intensive property?
    a) Temperature   b) Viscosity   c) Surface tension   d) All of these

11. The temperature of the system decreases in an
    a) Adiabatic compression   b) Isothermal compression
    c) Isothermal expansion   d) Adiabatic expansion

12. If a refrigerator door is kept open, then we get:
    a) Room cooled
    b) Room heated
    c) More heat is passed out
    d) No effect on room

13. The enthalpy of vaporization of a liquid is 30 kJ mol^{-1} and entropy of vaporization is 75 J mol^{-1}. The boiling point of liquid at 1 atm is :
    a) 250 K   b) 400 K   c) 450 K   d) 600 K

14. Which is correct about the heat of combustion?
    a) The combustion be exothermic in some cases and endothermic in other cases
    b) Heat of combustion is always exothermic
    c) Its value change with temperature
    d) All of the above

15. In an isothermal process
    a) $q = 0$ and $\Delta E = 0$ b) $q \neq 0$ and $\Delta E = 0$ c) $q = 0$ and $\Delta E \neq 0$ d) $q \neq 0$ and $\Delta E \neq 0$

16. The enthalpy of combustion of H_2, cyclohexane (C_6H_{10}) and cyclohexane (C_6H_{12}) are $-241, -3800$ and -3920 kJ per mol respectively. Heat of hydrogenation of cyclohexane is
    a) 121 kJ/mol   b) -121 kJ/mol   c) $+242$ kJ/mol   d) -242 kJ/mol

17. For the isothermal expansion of an ideal gas
    a) E and H increases   b) E increases but H decreases
    c) H increases but E decreases   d) E and H are unaltered

18. Heat evolved in the reaction, $H_2 + Cl_2 \rightarrow 2HCl$ is 182 kJ. Bond energies of H—H and Cl—Cl are 430 and 242 kJ/mol respectively. The H—Cl bond energy is :
    a) 245 kJ mol^{-1} b) 427 kJ mol^{-1} c) 336 kJ mol^{-1} d) 154 kJ mol^{-1}

19. Which is not correct?
    a) In an exothermic reaction, the enthalpy of products is less than that of reactants
    b) $\Delta H_{fusion} = \Delta H_{sublimation} - \Delta H_{vaporisation}$
    c) A reaction for which $\Delta H^\circ < 0$ and $\Delta S^\circ > 0$ is possible at all temperatures
    d) ΔH is less than ΔU for the reaction,
       $C(s) + (1/2)O_2 \ (g) \rightarrow CO_2(g)$

20. A cylinder of gas is assumed to contain 11.2 kg of butane (C_4H_{10}). If a normal family needs 20000 kJ of energy per day. The cylinder will last (Given that ΔH for combustion of butane is -2658 kJ)
    a) 20 days   b) 25 days   c) 26 days   d) 24 days