DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : CHEMISTRY**
Date : **DPP No. : 8**

Topic :- Equilibrium

1. The conjugate acid of CO_3^{2-} is:
   a) H_2O b) H_2CO_3 c) OH^- d) HCO_3^-
2. Calculate the partial pressure of carbon monoxide from the following datas
   $CaCO_3C \xrightarrow{\Delta} CaO(g) + CO_2\uparrow K_p = 8 \times 10^{-2}$
   $O_2(g) + C(s) \rightarrow 2CO(g), \quad K_p = 2$
   a) 0.2 b) 0.4 c) 1.6 d) 4
3. In aqueous solution, the ionisation constants for carbonic acid are,
   $K_1 = 4.2 \times 10^{-7}$ and $K_2 = 4.8 \times 10^{-11}$
   Select the correct statement for a saturated 0.034 M solution of the carbonic acid.
   a) The concentration of CO_3^{2-} is 0.034 M b) The concentration of CO_3^{2-} is greater than that of HCO_3^-
   c) The concentration of H^+ and HCO_3^- are approximately equal d) The concentration of H^+ is double that of CO_3^{2-}
4. The rapid change of pH near the stoichiometric point of an acid base titration is the basis of indicator detection. pH of the solution is related to the ratio of the concentration of the conjugate acid (HIn) and base (In^-) forms of the indicator given by the expression
   a) $\log\frac{[In^-]}{[HIn]} = pK_{In} - pH$ b) $\log\frac{[HIn]}{[In^-]} = pK_{In} - pH$
   c) $\log\frac{[HIn]}{[In^-]} = PH - pK_{In}$ d) $\log\frac{[In^-]}{[HIn]} = pH - pK_{In}$
5. The number of mole of hydroxide $[OH^-]$ ion in 0.3 litre of 0.005 M solution of $Ba(OH)_2$ is:
   a) 0.0075 b) 0.0015 c) 0.0030 d) 0.0050
6. 4.5 moles each of hydrogen and iodine heated in a sealed 10 L vessel. At equilibrium 3 moles of HI were found. The equilibrium constant for $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ is
   a) 1 b) 5 c) 10 d) 0.5
7. The degree of hydrolysis in hydrolytic equilibrium $A^- + H_2O \rightleftharpoons HA + OH^-$ at salt concentration of 0.001 M is ($K_a = 1 \times 10^{-5}$)
   a) 1×10^{-3} b) 1×10^{-4} c) 5×10^{-4} d) 1×10^{-6}

8. For a hypothetical equilibrium:
$4A + 5B \rightleftharpoons 4x + 6y$; the equilibrium constant K_c has the unit:
a) $mol^2 litre^{-2}$ b) $litre\ mol^{-1}$ c) $litre^2 mol^{-2}$ d) $mol\ litre^{-1}$

9. Salting out action of soap is based on:
a) Complex ion formation
b) Common ion effect
c) Solubility product
d) Acid-base neutralization

10. The equilibrium constant for the reaction,
$SO_2(g) + \frac{1}{2}O_2(g) \rightleftharpoons SO_3(g)$ is 5×10^{-2} atm. The equilibrium constant of the reaction $2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ would be
a) 100 atm b) 200 atm c) 4×10^2 atm d) 6.25×10^4 atm

11. Which can be explained as applications of Le-Chatelier's principle?
a) Transport of oxygen by haemoglobin in blood
b) Removal of CO_2 from tissues by blood
c) Tooth decay due to use of sweet substances
d) All of the above

12. Which equilibrium in gaseous phase would be unaffected by an increase in pressure?
a) $N_2O_4 \rightleftharpoons 2NO_2$ b) $N_2 + O_2 \rightleftharpoons 2NO$ c) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ d) $CO + \frac{1}{2}O_2 \rightleftharpoons CO_2$

13. The aqueous solution of $AlCl_3$ is acidic due to the hydrolysis of
a) Aluminum ion b) Chloride ion
c) Both aluminium and chloride ion d) None of the above

14. The percentage error in $[H^+]$ made by neglecting the ionisation of water in $1.0 \times 10^{-6} M$ NaOH is:
a) 1% b) 2% c) 3% d) 4%

15. The colour of $CuCr_2O_7$ solution in water is green because:
a) Cu^{2+} ions is green
b) $Cr_2O_7^{2-}$ ion is green
c) Both the ions are green
d) Cu^{2+} ion is blue and $Cr_2O_7^{2-}$ ion is yellow

16. Ammonium carbonate decomposes as
$NH_2COONH_4(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$
For the reaction, $K_p = 2.9 \times 10^{-5}\ atm^{-3}$. If we start with 1 mole of the compound, the total pressure at equilibrium would be
a) 0.0766 atm b) 0.0582 atm c) 0.388 atm d) 0.0194 atm

17. Ionic product of water increases if
a) Pressure is reduced b) H^+ is added
c) OH^- is added d) Temperature increase

18. In which of the following reactions, increases in the volume at constant temperature do not affect the number of moles at equilibrium?

a) $2NH_3 \rightleftharpoons N_2 + 3H_2$ b) $C(s) + \frac{1}{2}O_2(g) \rightarrow CO(g)$

c) $H_2(g) + O_2(g) \rightarrow H_2O_2(g)$ d) None of the above

19. Which one of the following is least likely to act as a Lewis base?

a) I^+ b) I c) SCl_2 d) PCl_3

20. An aqueous solution of ammonium acetate is:

a) Faintly acidic b) Fair acidic c) Faintly alkaline d) Almost neutral