

Class : XIth
Date :

Subject : CHEMISTRY
DPP No. : 4

Topic :- Equilibrium

- A solution is called saturated if:
 - Ionic concentration product < solubility product
 - Ionic concentration product > solubility product
 - Ionic concentration product \geq solubility product
 - None of the above
- The auto protonation constant of H₂O is:
 - 1×10^{-14}
 - 3.23×10^{-18}
 - 1.8×10^{-18}
 - 3.23×10^{-20}
- K_c for $m_1A + m_2B = n_1C + n_2D$ is given by:
 - $K_c = \frac{[A]^{m_1}[B]^{m_2}}{[C] \times [D]}$
 - $K_c = \frac{[A]^{n_1}[B]^{n_2}}{[C]^{m_1}[D]^{m_2}}$
 - $K_c = \frac{[C]^{n_1}[D]^{n_2}}{[A]^{m_1}[B]^{m_2}}$
 - $K_c = \frac{[C]^{m_1} \times [D]^{m_2}}{[A]^{n_1} \times [B]^{n_2}}$
- The pH of millimolar HCl is
 - 1
 - 3
 - 2
 - 4
- Partial pressure of A, B, C and D on the basis of gaseous system, $A + 2B \rightleftharpoons C + 3D$, are $A = 0.20$, $B = 0.10$, $C = 0.30$ and $D = 0.50$ atm. The numerical value of equilibrium constant is
 - 3.75
 - 18.75
 - 17.85
 - 15.87
- Which equilibrium can be described as Lewis acid-base reaction but not Bronsted acid-base reaction?
 - $H_2O + CH_3COOH \rightleftharpoons H_3O^+ + CH_3COO^-$
 - $2NH_3 + H_2SO_4 \rightleftharpoons 2NH_4^+ + SO_4^{2-}$
 - $NH_3 + CH_3COOH \rightleftharpoons NH_4^+ + CH_3COO^-$
 - $[Cu(H_2O)_4]^{2+} + 4NH_3 \rightleftharpoons [Cu(NH_3)_4]^{2+} + 4H_2O$
- $SnCl_2$ and $HgCl_2$ cannot co-exist in a solution because of:
 - Common ion effect
 - Le – Chatelier's principle
 - Conc. of Cl^- increases to precipitate both
 - Redox change
- The species which acts as a Lewis but not a Bronsted acid is
 - NH_2^-
 - O^{2-}
 - BF_3
 - OH^-

9. What is the best description of the change that occurs when $\text{Na}_2\text{O}(s)$ is dissolved in water?
- Oxidation number of sodium decreases
 - Oxide ion accepts sharing in a pair of electrons
 - Oxide ion donates a pair of electrons
 - Oxidation number of oxygen increases
10. pH of 0.005 M calcium acetate is
(pK_a of $\text{CH}_3\text{COOH} = 4.74$)
- 7.04
 - 9.37
 - 9.26
 - 8.2195
11. Relation between hydrolysis constant and dissociation constant are given. Which is the correct formula for MgCl_2 ?
- $K_h = \frac{K_w}{K_a}$
 - $K_h = \frac{K_w}{K_b}$
 - $K_h = \frac{K_w}{K_a \times K_b}$
 - $K_w = \frac{K_h}{K_b}$
12. Theory's 'active mass' indicates that the rate of chemical reaction is directly proportional to the
- Equilibrium constant
 - Volume of apparatus
 - Properties of reactants
 - Concentration of reactants
13. In which of the following reactions, the value of K_p will be equal to K_c ?
- $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
 - $2\text{NH}_3 \rightleftharpoons \text{N}_2 + 3\text{H}_2$
 - $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$
 - $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$
14. In the hydrolysis of a salt of weak acid and weak base, the hydrolysis constant K_h is equal to
- $\frac{K_w}{K_b}$
 - $\frac{K_w}{K_a}$
 - $\frac{K_w}{K_a \cdot K_b}$
 - $K_a \cdot K_b$
15. In which reaction ammonia acts as an acid?
- $\text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4\text{Cl}$
 - $\text{NH}_3 + \text{H}^+ \rightarrow \text{NH}_4^+$
 - $\text{NH}_3 + \text{Na} \rightarrow \text{NaNH}_2 + \frac{1}{2}\text{H}_2$
 - NH_3 cannot act as an acid
16. The compounds A and B are mixed in equimolar proportion to form the products, $A + B \rightleftharpoons C + D$. At equilibrium, one third of A and B are consumed. The equilibrium constant for the reaction is
- 0.5
 - 4.0
 - 2.5
 - 0.25
17. 40% of a mixture of 0.2 mole of N_2 and 0.6 mole of H_2 react to give NH_3 according to the equation, $\text{N}_2(g) + 3\text{H}_2(g) \rightleftharpoons 2\text{NH}_3(g)$ at constant temperature and pressure. Then the ratio of the final volume to the initial volume of gases is :
- 4 : 5
 - 5 : 4
 - 7 : 10
 - 8 : 5
18. An aqueous solution contains a substance which yields 4×10^{-3} mol litre $^{-1}$ ion of H_3O^+ . If $\log 2 = 0.3010$, the pH of the solution is:
- 1.5
 - 2.398
 - 3.0
 - 3.4

19. For preparing a buffer solution of pH 6 by mixing sodium acetate and acetic acid, the ration of concentration of salt and acid ($K_a = 10^{-5}$) should be:
- a) 1 :10 b) 10 :1 c) 100 :1 d) 1 :100
20. The concentration of hydrogen ion $[H^+]$ and pH in 10 M HCl is:
- a) 10^1 ,zero b) 10^1 , - 1 c) 10^2 ,1 d) 10^1 ,1

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