# DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

**Solutions**

Subject : CHEMISTRY
DPP No. : 7

# Topic :- Equilibrium

1 **(b)**

Hydrolysis of $CH_3COO^-$ give alkaline solution.

2 **(d)**

For hydrolysis of $NH_4^+$;

$$K_H = \frac{K_w}{K_p} = \frac{10^{-14}}{1.8 \times 10^{-5}} = 5.5 \times 10^{-10}$$

3 **(c)**

In water, barium hydroxide is hydrolysed as followers

$Ba(OH)_2 \rightleftharpoons Ba^{2+} + 2OH^-$

Conc. Of $Ba^{2+} = 1 \times 10^{-3} M$

Conc. of $[OH^-] = 2 \times 1 \times 10^{-3} M$

$= 2 \times 10^{-3} M$

$pOH = -\log[OH^-]$

$= -\log(2 \times 10^{-3})$

$= 2.69$

$pH + pOH = 14$

$pH = 14 - pOH$

$= 14 - 2.69$

$= 11.3$

$\approx 11.0$

4 **(d)**

In the titrationof weak acid with strong base, phenolphthalein is used

6 **(a)**

In a reversible reaction some amount of the reactants remains unconverted into products and it never go for completion

7 **(d)**

$K_a$ for $H_2S = \frac{[H^+][HS^-]}{[H_2S]}$;

An increase in $[H^+]$ will show a decrease in $[HS^-]$ to maintain constant $K_a$ value.

8 **(d)**

Le-Chatelier proposed a principle to explain the effect of $P, T$ and $C$ on systems in equilibrium.

9 **(a)**

$pK_a = -\log K_a$

Higher the value of $pK_a$, weaker is the acid. Among given choices 2.0, 2.5, 3.0 and 4.0 the value 2.0 is lowest so this acid is strongest.

10 **(c)**

Alkali and alkaline earth metal hydroxides are strong base.

11 **(a)**

$pH = 9 \therefore [H^+] = 10^{-9}$

$pH = 6 \therefore [H^+] = 10^{-6}$

12 **(d)**

Aprotic solvents are those from which hydrogen ion or $OH^-$ cannot be derived.

13 **(b)**

$Co(OH)_2$ is not precipitated in III gp. or it more soluble and thus, has high $K_{sp}$.

14 **(b)**

$[A^+][B^-] > K_{sp}$.

15 **(a)**

$pH = \frac{1}{2}[pK_{a_1} + pK_{a_2}] = \frac{1}{2}[14.15 + 6.89] = 10.52$

16 **(d)**

| | | | | | |
|---|---|---|---|---|---|
| $A$ + | $B$ | $\rightleftharpoons$ | $C$ + | $D$ | |
| 1 | 1 | | 0 | 0 | Initially |
| $(1-3x)$ | $(1-3x)$ | | $3x$ | $3x$ | At equilibrium (given) |

At equilibrium, the remaining moles of $A$ is $x$, because $3x$ moles of $C$ are produced.

$\Rightarrow \quad 1 - 3x = x$

$\therefore \quad x = \frac{1}{4}$

Equilibrium constant,

$$K_c = \frac{[C][D]}{[A][B]} = \frac{3x.3x}{(1-3x)^2}$$

On putting the value of $x$, we get,

$$K_c = \frac{9 \times \frac{1}{16}}{1 + \frac{9}{16} - \frac{6}{4}} = \frac{9}{1} = 9$$

17 **(a)**

The acidic character of $HClO_4$ is maximum. The order is

$HClO_4 > HClO_3 > H_2SO_4 > H_2SO_3$.

19 **(c)**

$K_p$ is independent of initial concentration.

20 **(d)**

20% yield of $NH_3$ and thus, 20% of 340 g is

$$= \frac{20 \times 340}{100} = 68 \text{ g}$$

| ANSWER-KEY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Q.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **A.** | **B** | **D** | **C** | **D** | **A** | **A** | **D** | **D** | **A** | **C** |
| | | | | | | | | | | |
| **Q.** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| **A.** | **A** | **D** | **B** | **B** | **A** | **D** | **A** | **A** | **C** | **D** |
| | | | | | | | | | | |