

# DPP

DAILY PRACTICE PROBLEMS

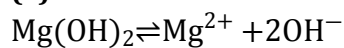
Class : XIth  
Date :

## Solutions

Subject : CHEMISTRY  
DPP No. : 5

### Topic :- Equilibrium

1 (a)



$s$   $2s$

$$K_{sp} \text{Mg(OH)}_2 = [\text{Mg}^{2+}][\text{OH}^-]^2$$

$$\Rightarrow K_{sp} \text{Mg(OH)}_2 = 4s^3$$

$$1.96 \times 10^{-11} = 4s^3$$

or

$$s = \left[ \frac{1.96 \times 10^{-11}}{4} \right]^{1/3}$$

or

$$s = (4.9 \times 10^{-12})^{1/3}$$

$\therefore$

$$s = 1.96 \times 10^{-4}$$

So, concentration of  $[\text{OH}^-] = 2s$

$\therefore$

$$[\text{OH}^-] = 3.38 \times 10^{-4}$$

$\Rightarrow$

$$\begin{aligned} \text{pOH} &= -\log [\text{OH}^-] \\ &= -\log [3.38 \times 10^{-4}] \end{aligned}$$

$$\text{pOH} = 3.471$$

$$\text{pH} = 14 - \text{pOH}$$

$$= 14 - 3.471$$

$\therefore$

$$\text{pH} = 10.529$$

2 (c)

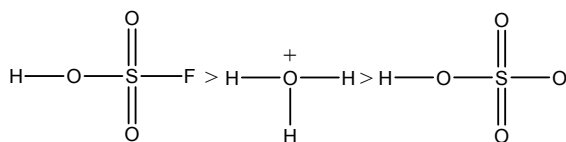
$$K_p = K_c (RT)^{\Delta n};$$

3 (c)

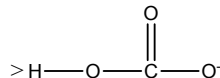
$K_c$  is characteristic constant for a given reaction at a temperature ;  $K_p = P_{\text{CO}_2}$ .

4 (c)

Acidity order



(Conjugate anion decreases acidity)



5

**(c)**

For precipitation,

ionic product > solubility product ( $K_{sp}$ )

For,  $\text{Ag}_2\text{CrO}_4$

$$\begin{aligned} \text{ionic product} &= [\text{Ag}^+]^2[\text{CrO}_4^-] \\ &= (10^{-4})^2(10^{-5}) = 10^{-13} \end{aligned}$$

$$K_{sp} \text{ of } \text{Ag}_2\text{CrO}_4 = 4 \times 10^{-12}$$

Here,  $K_{sp} > \text{IP}$

This, no precipitate is obtained.

$$\begin{aligned} \text{For } \text{AgCl}, \text{ ionic product} &= [\text{Ag}^+][\text{Cl}^-] = [10^{-4}][10^{-5}] \\ &= 10^{-9} \end{aligned}$$

$$K_{sp}(\text{AgCl}) = 1 \times 10^{-10}$$

Here,  $\text{IP} > K_{sp}$

So, precipitate will form.

Thus, silver chloride gets precipitated first.

6

**(d)**

It is basic lead carbonate.

7

**(d)**

$K_p$  or  $K_c$  are characteristic constants for a given reaction.

8

**(b)**

$$K_c = [\text{Ca}^{2+}][\text{F}^-]^2;$$

$$\text{If } [\text{Ca}^{2+}] = 4 \times [\text{Ca}^{2+}];$$

To have  $K_c$  constant  $[\text{F}^-]$  should be  $\frac{[\text{F}^-]}{2}$ .

10

**(d)**

Strong conjugate base has a weak conjugate acid. Weakest conjugate acid is  $\text{CH}_3\text{COOH}$ .

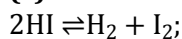
11

**(b)**

$\text{I}^-$  is electron pair donor.

12

**(c)**



$$K_c = \frac{\alpha^2}{4(1 - \alpha)^2}$$

Where  $\alpha$  is degree of dissociation,

$$\text{Also, } \alpha = \frac{22}{100}$$

$$\therefore K_c = 0.0199$$

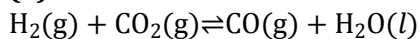
13 **(c)**

ZnO reacts with acid and alkalis both.

14 **(c)**

$$\Delta n = -1 \text{ and } K_p = K_c \times (RT)^{\Delta n}$$

15 **(a)**



Initial conc.            1            1            0            0

At equilibrium (1 - x)(1 - x)            x            x

$$K_p = \frac{p_{\text{CO}} \cdot p_{\text{H}_2\text{O}}}{p_{\text{H}_2} \cdot p_{\text{CO}_2}} = \frac{x \cdot x}{(1 - x)(1 - x)} = \frac{x^2}{(1 - x)^2}$$

16 **(c)**

In this equation, volume is decreasing and the reaction is exothermic. So, for the highest yield of Z, pressure should be high and temperature should be low.

17 **(a)**

The pH of salt  $\text{BaCl}_2 = 7$  whereas  $\text{SrCl}_2$  and  $\text{CaCl}_2 \approx 7$  and  $\text{MgCl}_2 < 7$ .

18 **(d)**

Lewis definition suggests that an acid must be capable of accepting lone pair in its vacant orbital. Smaller ion shows more attraction towards lone pair of electron.

19 **(c)**

$$\text{Degree of dissociation, } \alpha = \frac{D - d}{d}$$

$$= \frac{46 - 30}{30}$$

$$= 0.533 \text{ or } 53.3\%$$

20 **(d)**

$$\Delta n = 0 \text{ then, } K_p = K_c$$

$$\text{For (d)} \Delta n = 1$$

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

**PE**