س13 الجواب الصحيح
هو 2.08×10^{-13}

Test bank chapter (15)

Choose the most correct answer

1-What is the concentration of H^+ in a 2.5 M HCl solution?

هو عمل فعشان كدا نفسه

a) 0
b) 1.3 M
c) 2.5 M
d) 5.0 M

2. What is the OH^- ion concentration in a 5.2×10^{-4} M HNO_3 solution?

$[H^+]$

a) 1.9×10^{-11} M
b) 1.0×10^{-7} M
c) 5.2×10^{-4} M
d) Zero

$K_w = [OH^-][H^+]$ القانون

$[OH^-] = \frac{1 \times 10^{-14}}{5.2 \times 10^{-4}} = 1.9 \times 10^{-11}$

3. Calculate the H^+ ion concentration in lemon juice having a pH of 2.4.

a) 4.0×10^{-2} M
b) 250 M
c) 0.38 M
d) 4.0×10^{-3} M

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

$[H^+] = 10^{-2.4}$

$= 3.9 \times 10^{-3} \approx 4 \times 10^{-3}$ M

4. Calculate the pH of a 6.71×10^{-2} M NaOH solution.

$[OH^-]$

a) 12.83
b) 2.17
c) 11.82
d) 6.71

$K_w = [OH^-][H^+]$

$[H^+] = \frac{1 \times 10^{-14}}{6.71 \times 10^{-2}} = 1.49 \times 10^{-3}$

$PH = -\log[H^+] \Rightarrow PH = -\log[1.49 \times 10^{-13}] = 12.83$

طريقة ثانية:

$PoH = -\log(6.71 \times 10^{-2})$

$= 1.17$

$PH + PoH = 14 \Rightarrow PH = 14 - 1.17 = 12.83$

5. What is the pH of 0.0200 M aqueous solution of HBr ?

$[H^+]$

a) 1.00
b) 1.70
c) 2.30
d) 12.30

$PH = -\log[H^+] \Rightarrow PH = -\log(0.0200) = 1.699 \simeq 1.70$

6. The pOH of a solution of NaOH is 11.30. What is the $[H^+]$ for this solution?

POH

a) 2.0×10^{-3}
b) 2.5×10^{-3}
c) 5.0×10^{-12}
d) 4.0×10^{-12}

$PoH + PH = 14$

$PH = 14 - PoH$

$PH = 14 - 11.30 = 2.7$

$[H^+] = 10^{-PH}$

$[H^+] = 10^{-2.7} = 1.995 \times 10^{-3}$

$\approx 2 \times 10^{-3}$

7. What is the pH of a 0.0400 M aqueous solution of KOH?

$[OH^-]$

a) 12.60
b) 10.30
c) 4.00
d) 1.40

$K_w = [H^+][OH^-]$

$[H^+] = \frac{1\times10^{-14}}{0.0400} = 2.5\times10^{-13}$

$pH = -\log[H^+]$

$pH = -\log(2.5\times10^{-13})$

$= 12.60$

طريقة اخرى (7)

$pOH = -\log(0.04)$

$= 1.38$

$pH + pOH = 14 \Rightarrow pH = 14 - 1.38 = 12.62$

8. What is the approximate pH of a solution labeled 6 x 10^{-5} M HBr?

a) **4.2**
b) 4.5
c) 5.8
d) 9.8

$pH = -\log[H^+]$

$pH = -\log(6\times10^{-5}) = 4.2$

9. If the pH = 2 for an HNO_3 solution, what is the concentration of HNO_3?

a) 0.10
b) 0.20
c) **0.010**
d) 0.020

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

$[H^+]$ تركيز

$= 10^{-2} = 0.01$

10. A solution in which $[H^+] = 10^{-8}$ M has a pH of 8 and is basic

pH

a) 8, acidic
b) 6, basic
c) -6, basic
d) **8, basic**

$pH = -\log[H^+] \Rightarrow [H^+] = 10^{-pH}$

$= -\log(10^{-8})$

$= 8 > 7 \rightarrow$ basic

11. Which of the following solutions has the lowest pH at 25°C? (No calculations required.)

a) 0.2 M NaOH → قاعدة
b) 0.2 M NH_3 → قاعدة
c) **0.2 M HCl** → حمض
d) pure water → متعادل

قاعدة $pH > 7$

حمض $pH < 7$

حمض | قاعدة

0 | 7 | 14

12. Calculate the pH of a 3.5×10^{-3} M HNO_3 solution.

$[H^+]$

a) -2.46
b) 0.54
c) **2.46**
d) 3.00

$pH = -\log[H^+]$

$= -\log(3.5\times10^{-3})$

$= 2.46$

13. The pH of 2.6×10^{-2} M KOH is

$[OH^-]$ قاعدي

a) **12.41**
b) 15.59
c) 2.06
d) 7.00

$pOH = -\log(2.6\times10^{-2})$

$= 1.585$

$pH + pOH = 14$

$pH = 14 - 1.59 = 12.41$

طريقة اخرى:

$K_w = [H^+][OH^-]$

$[H^+] = \frac{K_w}{[OH^-]}$

$= \frac{1\times10^{-14}}{2.6\times10^{-2}} = 3.846\times10^{-13}$

$pH = -\log[H^+]$

$pH = -\log(3.846\times10^{-13})$

$= 12.41$

$[OH^-]$

14. What is the $[H^+]$ ion in a 4.8×10^{-2} M KOH solution?

a) 2.8×10^{-13} M
b) 1×10^{-7} M
c) 4.8×10^{-11} M
d) 4.8×10^{-2} M

$K_w = [H^+][OH^-]$

$[H^+] = \frac{1 \times 10^{-14}}{4.8 \times 10^{-2}} = 2.083 \times 10^{-13}$

15. What is the $[OH^-]$ ion in a 5.2×10^{-4} M HNO_3 solution?

$[H^+]$

a) 1.9×10^{-11} M
b) 1.0×10^{-7} M
c) 5.2×10^{-4} M
d) zero

$K_w = [H^+][OH^-]$

$[OH^-] = \frac{1 \times 10^{-14}}{5.2 \times 10^{-4}} = 1.9 \times 10^{-11} M$