

$$1) K_{sp} = [Ag^+] [Br^-]$$

$$7,7 \times 10^{-3} = S^2$$

$$S = 8,8 \times 10^{-7} M$$

(D)

$$2) K_2 = \frac{1}{K_1} = \frac{1}{1,8 \times 10^{-5}} = 5,6 \times 10^4$$

(B)

3)

$$\mu = \frac{1}{2} \left((+3)^2 (0,1) + 3 (-1)^2 (0,1) \right) = 0,6$$

$$\mu(KCl) = \frac{1}{2} \left((+1)^2 (0,2) + (-1)^2 (0,2) \right) = 0,2$$

$$\mu(NH_3) = \text{zero}$$

$$\mu = 0,6 + 0,2 + \text{zero} = 0,8$$

(C)

4)

$$\text{mol } Cl^- = M \cdot V(L) = \frac{100}{1000} \times 0,25 = 0,025$$

$$\text{mol } NaCl = \text{mol } (AgNO_3) = 0,025$$

$$\text{mol } AgNO_3 \text{ 5\% excess} = 0,025 \times 1,05 = 0,02625$$

$$\text{mass } AgNO_3 = 0,02625 \times 170 = 4,4625 \text{ g}$$

$$\text{mass of 25 wt\%} = \frac{4,4625}{\frac{25}{100}} = 17,85$$

$$\text{density} =$$

$$\text{Volume} = \frac{\text{mass}}{\text{density}} = \frac{17,85}{1,4} = 12,7$$

5) ⑥ 14 g/g

6) $\bar{X} = \frac{23,4 + 23,2 + 22,8 + 26 + 24 + 23}{6} = 23,7$

$\bar{S} = \sqrt{\frac{\sum (x_i - \bar{X})^2}{n-1}} = 1,2$

⑦

7) ① 14

8) ② 1

~~0,01~~ $0,01 + 0,09 = 0,1$

$\text{pH} = -\log(\text{H}^+) = 1$

9) $C_1 V_1 = C_2 V_2$
 $(0,15)(505) = (0,1)(V)$

~~$V = 755,5$~~

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$V = 757 \text{ mL}$

⑧

10) $\text{wt\%} = \frac{\text{mass solute} \times 100}{\text{mass solution}} = \frac{10}{240} \times 100 = 4\%$

⑨

$\text{wt\%} = \frac{\text{mass solute}}{\text{mass solution}} \times 100 = \frac{10}{240} \times 100 = 4\%$

$\text{ppm} = \frac{\text{mass solute}}{\text{mass solution}} \times 10^6 = \frac{10}{240} \times 10^6 = 40000 \text{ ppm}$

III) ~~5,5 Tm~~

$$5,5 \text{ Tm} \times \frac{10^{12} \text{ Km}}{10^3 \text{ Tm}} = 5,5 \times 10^9$$

(B)

12) $[H^+] = 10^{-pH} = 10^{-4,184} = 6,85 \times 10^{-5} \text{ M}$

13) Molarity = $\frac{\text{mol solute}}{\text{Volume (L)}}$

$$5,24 = \frac{\text{mol solute}}{1}$$

$$\text{mol solute} = 5,24$$

$$\text{mass solute} = 5,24 \times 84 = 440,16 \text{ g}$$

$$\text{density} = \frac{\text{mass solution}}{\text{Volume (mL)}}$$

$$\text{mass solution} = 1,14 \times 1000 = 1140 \text{ g}$$

$$\text{mass solvent} = 1140 - 440,16$$

$$\text{mass solvent} = 744,84 \text{ g}$$

$$\text{molality} = \frac{\text{mol solute}}{\text{kg solvent}} = \frac{5,24}{0,74484} = 6,44$$

$$m = 6,44$$

(A)

$$V(\text{ml}) = \frac{\text{mol}}{M} = \frac{16,2 \times 10^{-3}}{\frac{0,750}{1000}} = 21,6$$

نفس حل سوال (1)

$$\boxed{16} \textcircled{D} \quad 0,30 \text{ M} = 2[\text{Br}^-] + [\text{MgBr}^+]$$

$$\boxed{17} \text{ mol} = V \cdot M = \frac{250}{1000} \times 4 \times 10^{-3} = 1 \times 10^{-3} \text{ mol}$$

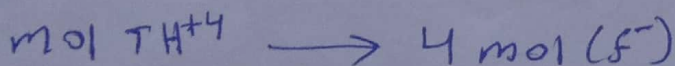
$$\text{mass} = \text{mol} \times M_{\text{mass}} = 1 \times 10^{-3} \times 249,68 =$$

mass = 0,244 ~~g~~ g (C)

18) $\log(3,4 \times 10^{-4}) + 4,45 = -3,47 + 4,45 = \underline{\underline{0,98}}$

$$= 0,48 \quad \textcircled{B}$$

14 $\text{mol}_{(\text{Th}^{4+})} = M \cdot V = \frac{25}{1000} \times 0,023 = 0,00054 \text{ mol}$



$$0,00059 \rightarrow x \text{ mol } (F^-)$$

$$\text{mol}(\text{F}^-) = \text{mol}(\text{HF}) = 0,00236$$

$$\text{mol(Hf)} \text{ 5\% excess} = 1,5 \times 0,0023 = 0,00354$$

$$\text{mass}(\text{HF}) = 0,00354 \times 20 = 0,0708 \text{ g}$$

mass of 0,441 wt% = $\frac{0,0708}{0,441} \times 100 = 14,4 \text{ g}$

$$20] \text{ pH} = -\log(\text{H}^+) = -\log(2,70 \times 10^{-6}) = 5,564$$

(C)

21]

نفس حل السؤال (10)

22]

$$K_{a2} = \frac{[\text{H}^+][\text{CO}_3^{2-}]}{[\text{HCO}_3^-]} = \frac{[\text{H}^+] 2[\text{HCO}_3^-]}{[\text{HCO}_3^-]}$$

$$K_{a2} = 2[\text{H}^+]$$

$$\frac{2,2 \times 10^{-7}}{2} = [\text{H}^+]$$

$$[\text{H}^+] = 1,1 \times 10^{-7}$$

$$\text{pH} = -\log(\text{H}) = -\log(1,1 \times 10^{-7})$$

$$\text{pH} = 6,96$$

(B)

23]

$$K_{sp} = [\text{Ag}^+][\text{Br}^-]$$

$$7,7 \times 10^{-13} = [\text{Ag}^+][0,001]$$

$$7,7 \times 10^{-10} = [\text{Ag}^+]$$

24]

$$K_{sp} = [\text{Ag}^+][\text{Br}^-]$$

$$7,7 \times 10^{-13} = s^2$$

$$s = 8,8 \times 10^{-7}$$

$$25 \quad \text{molarity} = \frac{\text{mol solute}}{\text{Volume}} = \frac{1,12}{0,07042} = 15,8 \text{ M}$$

$$\text{mol solute} = \frac{70,4}{63} = 1,12$$

$$\text{Volume} = \frac{100}{1,41} = 70,92 \text{ mL} = 0,07092 \text{ L}$$

$$26 \quad (18) \quad \text{نفس حل الـ 18}$$

$$27 \quad \bar{X} = \frac{5,2 + 6,8 + 6,5 + 6,3 + 5,1}{5} = 6,14$$

$$S = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}} = 0,55$$

$$CI = \bar{X} \pm \frac{S}{\sqrt{n}} = 6,14 \pm \frac{0,55 \times 2,132}{\sqrt{5}}$$

$$CI = 6,14 \pm 0,5$$

(D)

$$28 \quad [H^+] = 10^{-pH} = 10^{-4,164} = 5,85 \times 10^{-5} \text{ M}$$

29 (A)