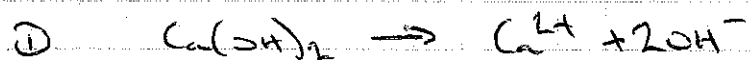


Strong Bases

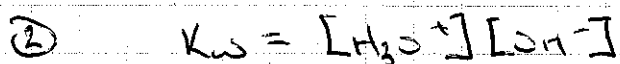


$$[\text{OH}^-] = 2[\text{Ca(OH)}_2] = 2(6.9 \times 10^{-3}) = 0.0138 \text{ mol/L}$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-]$$

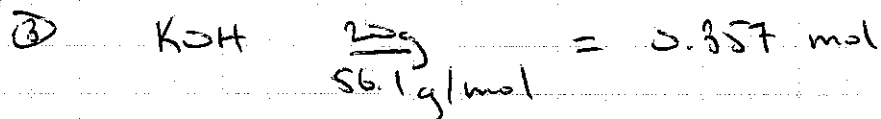
$$1 \times 10^{-14} = [\text{H}_3\text{O}^+] 0.0138$$

$$[\text{H}_3\text{O}^+] = \boxed{7.25 \times 10^{-13} \text{ mol/L}}$$

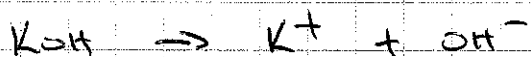


$$1 \times 10^{-14} = [\text{H}_3\text{O}^+] 2.99 \times 10^{-4}$$

$$[\text{H}_3\text{O}^+] = \boxed{3.34 \times 10^{-11} \text{ mol/L}}$$



$$\frac{0.357 \text{ mol}}{0.5 \text{ L}} = 0.713 \text{ mol/L}$$



$$[\text{OH}^-] = [\text{KOH}] = 0.713 \text{ mol/L}$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-]$$

$$1 \times 10^{-14} = [\text{H}_3\text{O}^+] 0.713$$

$$[\text{H}_3\text{O}^+] = \boxed{1.40 \times 10^{-14} \text{ mol/L}}$$



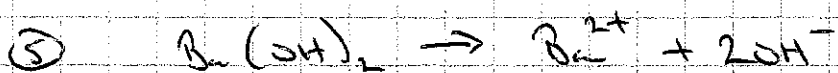
$$[\text{OH}^-] = [\text{NaOH}] = 0.15 \text{ mol/L}$$

$$p\text{OH} = -\log(0.15) = 0.824$$

$$p\text{H} = 14 - p\text{OH}$$

$$= 14 - 0.824$$

$$p\text{H} = \boxed{13.18}$$



$$[\text{OH}^-] = 2[\text{Ba}(\text{OH})_2] = 2(0.032) = 0.064 \text{ mol/L}$$

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

$$1 \times 10^{-14} = [\text{H}^+] 0.064$$

$$[\text{H}^+] = 1.56 \times 10^{-13} \text{ mol/L}$$

$$p\text{H} = -\log(1.56 \times 10^{-13})$$

$$p\text{H} = \boxed{12.81}$$



$$[\text{OH}^-] = [\text{KOH}] = 1 \text{ mol/L}$$

$$p\text{OH} = -\log(1) = 0$$

$$p\text{H} = 14 - p\text{OH}$$

$$= 14 - 0$$

$$p\text{H} = \boxed{14}$$



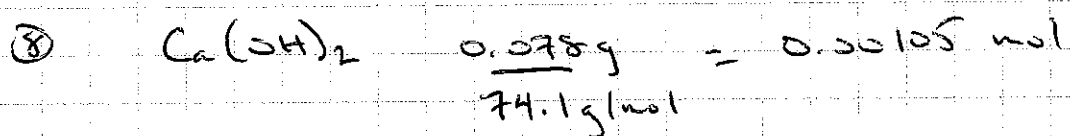
$$[\text{OH}^-] = 2[\text{Mg}(\text{OH})_2] = 2(2.4 \times 10^{-5}) = 4.8 \times 10^{-5} \text{ mol/L}$$

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

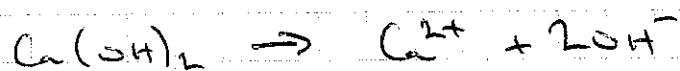
$$1 \times 10^{-14} = [\text{H}^+] 4.8 \times 10^{-5}$$

$$[\text{H}^+] = 2.1 \times 10^{-10} \text{ mol/L}$$

$$\text{pH} = -\log(2.1 \times 10^{-10}) = \boxed{9.68}$$



$$\frac{0.00105 \text{ mol}}{0.1 \text{ L}} = 0.0105 \text{ mol/L}$$



$$[\text{OH}^-] = 2[\text{Ca}(\text{OH})_2] = 2(0.0105) = 0.021 \text{ mol/L}$$

$$\text{pOH} = -\log(0.021) = 1.68$$

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

$$= 14 - 1.68$$

$$\text{pH} = \boxed{12.32}$$

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

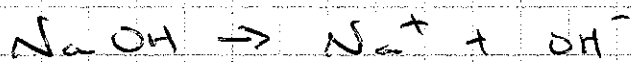
$$= 10^{-10.35}$$

$$[H^+] = 4.47 \times 10^{-11} \text{ mol/L}$$

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

$$1 \times 10^{-14} = 4.47 \times 10^{-11} [OH^-]$$

$$[OH^-] = 2.24 \times 10^{-4} \text{ mol/L}$$



$$[NaOH] = [OH^-] = 2.24 \times 10^{-4} \text{ mol/L}$$

$$2.24 \times 10^{-4} \text{ mol/L} \times 2 \text{ L} = 4.48 \times 10^{-4} \text{ mol NaOH}$$

$$4.48 \times 10^{-4} \text{ mol} \times 40 \text{ g/mol} = \boxed{0.018 \text{ g}} \text{ NaOH}$$