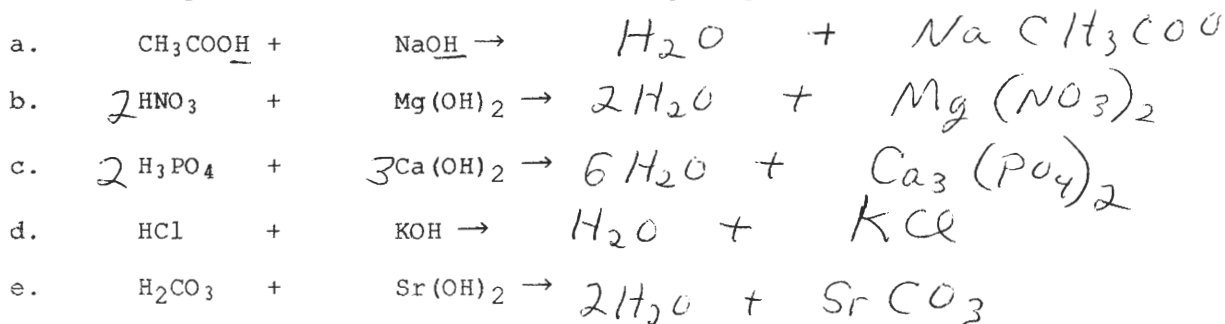


SHOW ALL WORK TO RECEIVE CREDIT. Molar masses: H = 1.01, Na = 23.0, C = 12.01, O = 16.00, Ca = 40.08

1. (5 Pts) Complete and balance the following complete neutralization reactions.

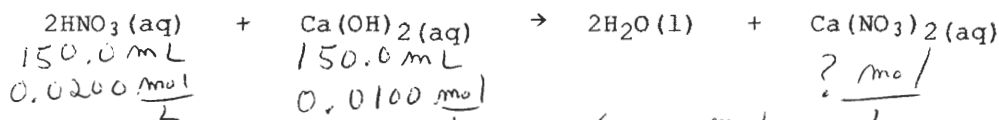


2. (5 Pts) How many grams of Ca(OH)_2 are contained in 1500 mL of 0.0250 M Ca(OH)_2 solution?

$$\frac{1500 \text{ mL}}{1000 \text{ mL}} \times \frac{0.0250 \text{ mol Ca(OH)}_2}{1 \text{ L}} \times \frac{74.1 \text{ g Ca(OH)}_2}{1 \text{ mol Ca(OH)}_2} = 27.79 \text{ g Ca(OH)}_2$$

3. (5 Pts) What is the molarity of $\text{Ca(NO}_3)_2$ in a solution resulting from mixing 150.0 mL of 0.0200 M HNO_3 with 150.0 mL of 0.0100 M Ca(OH)_2 ?

Ans: $5.00 \times 10^{-3} \text{ M Ca(NO}_3)_2$



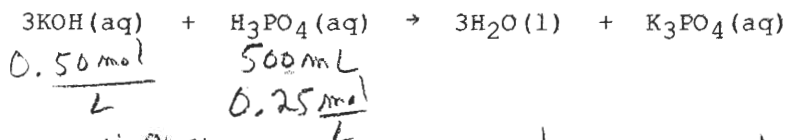
Based on HNO_3 :

$$\frac{150.0 \text{ mL}}{1000 \text{ mL}} \times \frac{0.0200 \text{ mol HNO}_3}{1 \text{ L}} \times \frac{1 \text{ mol Ca(NO}_3)_2}{2 \text{ mol HNO}_3} = 0.001500 \text{ mol Ca(NO}_3)_2$$

Based on Ca(OH)_2 :

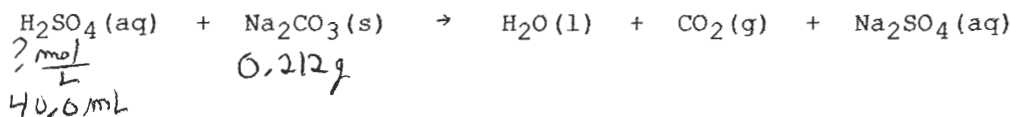
$$\frac{150.0 \text{ mL}}{1000 \text{ mL}} \times \frac{0.0100 \text{ mol Ca(OH)}_2}{1 \text{ L}} \times \frac{1 \text{ mol Ca(NO}_3)_2}{1 \text{ mol Ca(OH)}_2} = 0.001500 \text{ mol Ca(NO}_3)_2$$

4. (5 Pts) What volume of 0.50 M KOH would be required to neutralize completely 500 mL of 0.25 M H_3PO_4 solution?



$$\frac{500 \text{ mL}}{1000 \text{ mL}} \times \frac{0.25 \text{ mol H}_3\text{PO}_4}{1 \text{ L}} \times \frac{3 \text{ mol KOH}}{1 \text{ mol H}_3\text{PO}_4} = 750 \text{ mL KOH}$$

5. (5 Pts) Calculate the molarity of an H_2SO_4 solution if 40.0 mL of the H_2SO_4 solution reacts with 0.212 g of Na_2CO_3 .



$$\frac{0.212 \text{ g Na}_2\text{CO}_3}{106.01 \text{ g Na}_2\text{CO}_3} \times \frac{1 \text{ mol H}_2\text{SO}_4}{1 \text{ mol Na}_2\text{CO}_3} \times \frac{1 \text{ L}}{40.0 \times 10^{-3} \text{ L}} = 0.04999 \text{ mol/L H}_2\text{SO}_4$$