

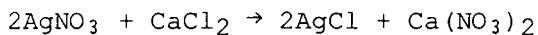
Information: mole = 6.02×10^{23} , molar masses: Ba = 137.33, Cl = 35.45, H = 1.01, O = 16.00,

SHOW ALL WORK FOR CREDIT.

1. (4 Pts) What is the molarity of a barium chloride solution prepared by dissolving 2.50 g of $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$ in enough water to make 400 mL of solution?

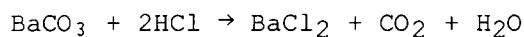
$$\frac{2.50 \text{ g } \text{BaCl}_2 \cdot 2\text{H}_2\text{O}}{400 \times 10^{-3} \text{ L}} \times \frac{1 \text{ mol } \text{BaCl}_2 \cdot 2\text{H}_2\text{O}}{244.27 \text{ g } \text{BaCl}_2 \cdot 2\text{H}_2\text{O}} \times \frac{1 \text{ mol } \text{BaCl}_2}{1 \text{ mol } \text{BaCl}_2 \cdot 2\text{H}_2\text{O}} = 0.0256 \frac{\text{mol } \text{BaCl}_2}{\text{L}}$$

2. (5 Pts) What volume of 0.150 M AgNO_3 solution is required to react with 80.0 mL of 0.0660 M CaCl_2 solution according to the following reaction?



$$\frac{80.0 \text{ mL } \text{CaCl}_2}{1000 \text{ mL } \text{CaCl}_2} \times \frac{0.0660 \text{ mol } \text{CaCl}_2}{1 \text{ mol } \text{CaCl}_2} \times \frac{2 \text{ mol } \text{AgNO}_3}{1 \text{ mol } \text{CaCl}_2} \times \frac{1000 \text{ mL } \text{AgNO}_3}{0.150 \text{ mol } \text{AgNO}_3} = 70.4 \text{ mL } \text{AgNO}_3$$

3. (5 Pts) Witherite is a mineral that contains barium carbonate. If a 1.68-g sample of witherite were to react completely with 24.6 mL of 0.2558 M HCl , what would be the percent of barium carbonate in the witherite sample? (Barium carbonate is the only compound present that reacts with the hydrochloric acid.)

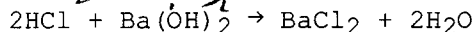


$$\frac{24.6 \text{ mL}}{1000 \text{ mL}} \times \frac{0.2558 \text{ mol } \text{HCl}}{1 \text{ mol } \text{HCl}} \times \frac{1 \text{ mol } \text{BaCO}_3}{2 \text{ mol } \text{HCl}} \times \frac{197.34 \text{ g } \text{BaCO}_3}{1 \text{ mol } \text{BaCO}_3} = 0.6208 \text{ g } \text{BaCO}_3$$

$$\% = \frac{\text{part}}{\text{whole}} \times 100$$

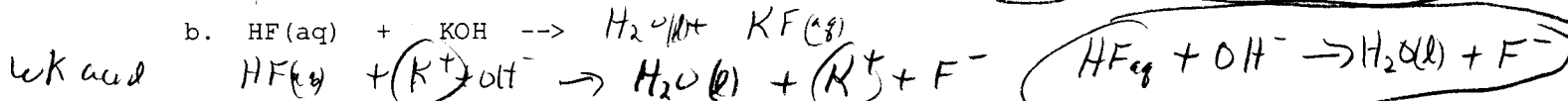
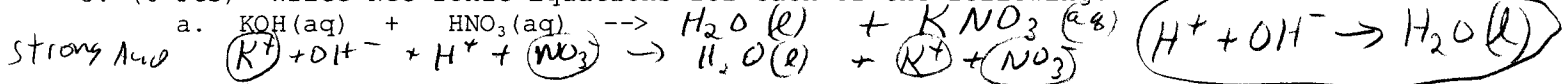
$$\frac{0.6208 \text{ g } \text{BaCO}_3}{1.68 \text{ g}} \times 100 = 37.0\%$$

4. (5 Pts) What is the molarity of a barium hydroxide solution if 18.62 mL of this $\text{Ba}(\text{OH})_2$ solution requires 35.84 mL of 0.2419 M HCl for titration to the equivalence point?



$$\frac{35.84 \text{ mL}}{1000 \text{ mL}} \times \frac{0.2419 \text{ mol } \text{HCl}}{1 \text{ mol } \text{HCl}} \times \frac{1 \text{ mol } \text{Ba}(\text{OH})_2}{2 \text{ mol } \text{HCl}} = 0.2328 \frac{\text{mol } \text{Ba}(\text{OH})_2}{\text{L } \text{Ba}(\text{OH})_2}$$

5. (6 Pts) Write Net Ionic Equations for each of the following.



- c. Combining aqueous solutions of BaI_2 and K_2SO_4 affords a precipitate of BaSO_4 .

