REVIEW QUESTIONS
Chapter 13

1. Calculate the molarity of the following solutions:

   a) 0.50 mol sugar in 270 mL of solution.

   b) 17.0 g of $AgNO_3$ in 0.500 L of solution.

2. Calculate the moles of solute needed to prepare each of the following solutions:

   a) 450 mL of 0.20 M KBr solution.

   b) 2.0 L of 1.5 M NaOH solution.

3. What volume (mL) of a 4.0 M solution of KCl contains 0.100 moles of solute?

4. What volume (mL) of a 1.5 M solution of NaCl contains 25.0 g of solute?

5. How many mL of a 15 M NH_3 solution is needed to prepare 50. mL of a 6.0 M NH_3 solution?

6. Calculate the molarity of a solution prepared by mixing 250 mL of 0.75 M H_2SO_4 with 150 mL of water.

7. What is the final volume, in mL, when 5.00 mL of 12.0 M NaOH is diluted to 0.600 M?

8. What volume of 0.125 M HNO_3 solution is required to neutralize 25.0 mL of 0.250 M NaOH solution, as shown below?

$$HNO_3 \text{ (aq)} + NaOH \text{ (aq)} \rightarrow NaNO_3 \text{ (aq)} + H_2O \text{ (l)}$$
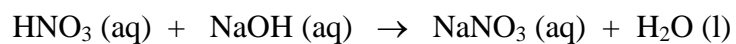
9. What mass of AgCl is produced when 155 mL of a 0.104 M solution of NaCl is reacted with excess $AgNO_3$ solution, as indicated below?

$$AgNO_3 \text{ (aq)} + NaCl \text{ (aq)} \rightarrow AgCl \text{ (s)} + NaNO_3 \text{ (aq)}$$
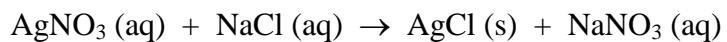
10. What volume (in mL) of a 1.25 M NaCl solution is required to completely precipitate all of the silver in 25.0 mL of a 0.45 M silver nitrate solution, as shown below?

$$AgNO_3 \text{ (aq)} + NaCl \text{ (aq)} \rightarrow AgCl \text{ (s)} + NaNO_3 \text{ (aq)}$$
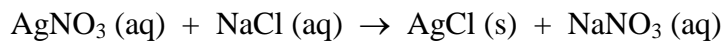
11. In the acid-base neutralization reaction shown below, 1.68 g of the solid acid HC_6H_5O neutralized 11.61 mL of aqueous NaOH solution as shown below. Based on this information, what is the molarity of the NaOH solution?

$$HC_6H_5O \text{ (s)} + NaOH \text{ (aq)} \rightarrow NaC_6H_5O \text{ (aq)} + H_2O \text{ (aq)}$$
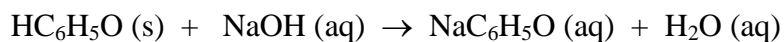
12. What is the molarity of $ZnCl_2$ that forms when 15.0 g of zinc completely reacts with $CuCl_2$ as shown below? (Assume a final volume of 175 mL)

$$Zn \text{ (s)} + CuCl_2 \text{ (aq)} \rightarrow ZnCl_2 \text{ (aq)} + Cu \text{ (s)}$$
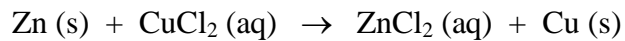
ANSWERS:

1a)	1.9 M
1b)	0.200 M
2a)	0.090 mol
2b)	3.0 mol
3)	25 mL
4)	290 mL (2 sig figs)
5)	20. mL (2 sig figs)
6)	0.47 M
7)	100. mL (3 sig figs)
8)	50.0 mL
9)	2.31 g
10)	9.0 mL
11)	1.54 M
12)	1.31 M