

Unit 4 – Chapter 4

Name _____

End of chapter practice problems

Period _____

1. Calculate the molarity of the following solutions:

a) 49.73 g H_2SO_4 in enough water to make 500 mL of solution.

1.01M

b) 5.035 g FeCl_3 in enough water to make 250 mL of solution.

0.12M

2. Calculate the molarity of the following solutions:

a) 21.18 g of $\text{Fe}(\text{NO}_3)_3$ in 1 L of water.

0.088M

b) 72.06 g of BaCl_2 in 500 mL of water.

0.69M

3. Calculate the concentrations of each of the ions in the following solutions:

a) 0.25 M Na_3PO_4

0.75 mol Na^+ , 0.25 mol PO_4^{3-} (0.75M Na^+ , 0.25M PO_4^{3-})

b) 0.87 M Na_2CO_3

1.74 mol Na^+ , 0.87 mol CO_3^{2-} (1.74M Na^+ , 0.87M CO_3^{2-})

4. Describe how you would prepare the following solutions:

a) 1 L of 1.5 M KMnO_4

237g KMnO_4 + ADD TO 1 L MARK

b) 250 mL of 0.2 M AgNO_3

8.5g AgNO_3 + ADD TO 250 mL MARK

5. Describe how you would prepare the following solutions:

a) 500 mL of 1.0 M H_2SO_4 from 17.8 M H_2SO_4

28mL STOCK + ADD TO 472mL H_2O

b) 1.5 L of 0.25 M KMnO_4 from 1.0 M stock solution.

0.375 L STOCK + ADD TO 1.125 L H_2O
(375mL)

c) 1.0 L of 0.15 M KBrO_3 from solid KBrO_3

25g KBrO_3 + ADD TO 1.0 L MARK

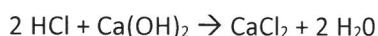
6. A standard solution of KHP ($\text{C}_8\text{H}_5\text{O}_4\text{K}$) was made by dissolving 3.697 g of KHP in enough water to make 100.0 mL of solution. Calculate the KHP concentration.

0.18M

7. A stock solution of sodium hydroxide is prepared by dissolving 120.0 g of NaOH in 500.0 mL of water. What is the molarity of the stock solution?

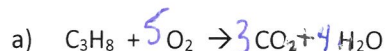
6.00M

8. How many milliliters of 0.50 M $\text{Ca}(\text{OH})_2$ are required to react with the HCl in 30 mL of a 0.12 M solution? The reaction of interest is:

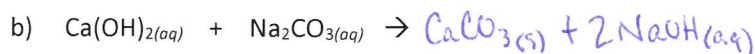
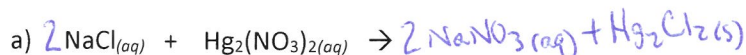


3.6mL

9. Balance the following reactions:

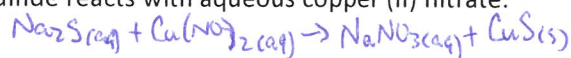


10. Complete and balance the following reactions:

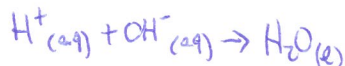
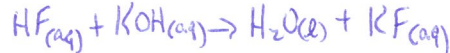


11. Write the molecular, complete ionic, and net ionic equations for the following reactions:

- a) Aqueous sodium sulfide reacts with aqueous copper (II) nitrate.



- b) Aqueous hydrogen fluoride reacts with aqueous potassium hydroxide to give water and aqueous potassium fluoride.



12. What mass of CaCO_3 is produced when 250 mL of 6.0 M Na_2CO_3 is added to 750 mL of 1.0 M CaF_2 ?

75g

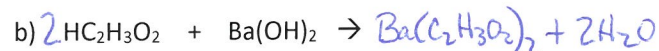
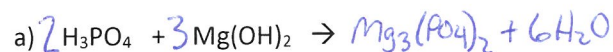
13. What volume of 0.1379 M HCl is required to neutralize 10.0 mL of 0.2789 M NaOH solution?

20.2mL

14. How many mL of 1.50 M NaOH is required to neutralize 275 mL of 0.5 M H_2SO_4 ?

183mL

15. Complete and balance each acid-base equation (assume complete neutralization):



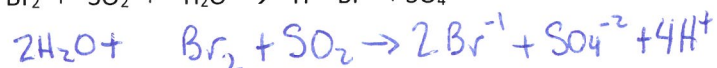
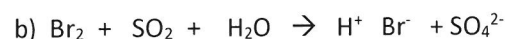
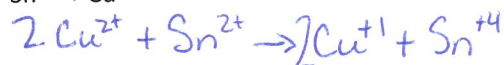
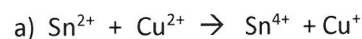
16. What volume of 0.2 M NaOH is required to neutralize 50 mL of 0.1 M H_2SO_3 ?

50 mL

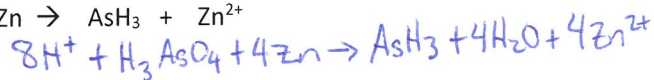
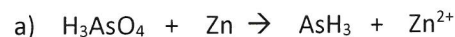
17. A 30.0 mL sample of an unknown basic solution is neutralized after the addition of 12.0 mL of a 0.15 M HCl solution. What is the molarity of the monoprotic base?

0.06 M

18. Balance the following oxidation-reduction reactions. Identify the oxidizing and agents.



19. Balance the following oxidation-reduction reactions taking place in acid solution:



20. Balance the following oxidation-reduction reactions taking place in basic solution:



