

Reactions in Aqueous Solutions

Practice Problems

aqsrxnsprc0809.doc

Name: _____

Date: _____ Period: _____

Molarity and Dilutions:

1. Determines the number of grams of potassium chloride required to make 250.mL of a .010M solution.

Answer: _____

2. How much water would need to be added to 50.0mL of a .200M solution to produce a final molarity of .050M?

Answer: _____

3. How many potassium ions are contained in a 25.0mL sample of a .002M potassium phosphate solution?

Answer: _____

4. Calculate the molarity of ammonium chloride in an aqueous solution that is 20.0% NH₄Cl by mass. The density of the solution is 1.06g/mL.

Answer: _____

5. A student attempts to produce 600.mL of a .500M solution of potassium nitrate by dissolving 50.0g of the solute in enough water to make 600.mL.

Is the solution the correct molarity? _____

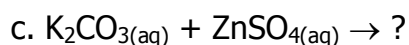
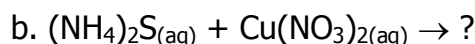
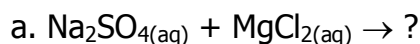
If not, explain how you would help the student fix their error.

6. Calculate the final molarity of *potassium* in a solution formed from combining 300.mL of .450M potassium sulfate with 425mL of .650M potassium acetate. Assume volumes are additive.

Answer: _____

Solubility and Precipitation:

7. Predict whether a precipitation reaction will occur in each of the following cases. If so, write a net ionic equation for the reaction.



8. Write a molecular, complete ionic and net ionic equation for the reaction between aqueous solutions of cupric sulfate and ammonium phosphate.

a.

b.

c.

9. How much insoluble silver chloride can be formed from the reaction between 10.0mL of .01M magnesium chloride and 20.0mL of .01M silver nitrate?

Answer: _____

10. In a reaction between solutions of lithium sulfate and barium chloride, if 25.0mL of .050M lithium sulfate reacts with 25.0mL of the barium chloride solution to produce .263g of insoluble barium sulfate, what is the molarity of the original barium chloride solution (assume a 100% yield)? Is this a limiting reagent problem?

Answer: _____

Acid-Base Neutralization / Titration:

11. What is the concentration of HCl molecules in a 0.100M solution of HCl? Explain.

12. Write net ionic equations for the following neutralization reactions:

a. The strong base KOH and the weak acid $\text{HC}_2\text{H}_3\text{O}_2$.

b. The strong base barium hydroxide and the strong acid perchloric acid.

c. The weak base methyl amine (CH_3NH_2) and the strong acid hydrobromic acid (HBr).

13. How many milliliters of .015M barium hydroxide are required to titrate exactly 50.0mL of a .112M hydrochloric acid solution?

Answer: _____

14. What is the molarity of a solution of hydroiodic acid if exactly 35.0mL of .010M lithium hydroxide is required to titrate 30.0mL of the acid solution to the equivalence point?

Answer: _____

15. What is the difference between the equivalence point and the endpoint in a titration?

