

Name _____ Per _____ Date _____

AP Chem HW 2-D

1. What mass of solid AgBr is produced when 100.0 mL of a 0.150 M AgNO₃ is added to 20.0 mL of 1.00 M NaBr?

2. What mass of Na₂CrO₄ is required to precipitate all of the silver ions from 75.0 mL of a 0.100 M solution of AgNO₃?

3. What volume of 0.100 M Na₃PO₄ is required to precipitate all the lead(II) ions from 150.0 mL of 0.250 M Pb(NO₃)₂?

4. A 1.42 g sample of a pure compound, with formula M₂SO₄, was dissolved in water and treated with an excess of aqueous calcium chloride, resulting in the precipitation of all the sulfate ions as calcium sulfate. The precipitate was collected, dried, and found to weigh 1.36g. Determine the atomic mass of M and identify M.

5. You are given a 1.50 g mixture of sodium nitrate and sodium chloride. You dissolve this mixture into 100 mL of water and then add an excess of 0.500 M silver nitrate solution. You produce a white solid, which you collect, dry, and measure. The white solid has a mass of 0.641 g.

- a. If you had an extremely magnified view of the solution (to the atomic molecular level), list the species you would see (include charges, if any).

- b. Write the balanced net ionic equation for the reaction that produces the solid. Include phases and charges.

- c. Calculate the percent sodium chloride in the original unknown mixture.

6. Write the balanced equation for the acid-base reactions that occur when the following are mixed:

- a. potassium hydroxide (aqueous) and nitric acid

- b. barium hydroxide (aqueous) and hydrochloric acid

- c. perchloric acid (aqueous) and solid iron(III) hydroxide

d. solid silver hydroxide and hydrobromic acid

e. aqueous strontium hydroxide and hydroiodic acid

7. What acid and what base would react in aqueous solution so that the following salts appear as products in the formula equation? Write the balanced formula equation for each reaction.

a. potassium perchlorate

b. cesium nitrate

c. calcium iodide

8. What volume of 0.150 M HNO_3 will react completely with 50.00 mL of 0.200 M NaOH ?

9. What volume of 0.0521 M $\text{Ba}(\text{OH})_2$ is required to neutralize exactly 14.20 mL of 0.141 M H_3PO_4 ?

10. A 2.20 g sample of an unknown acid (empirical formula = $\text{C}_3\text{H}_4\text{O}_3$) is dissolved in 1.0 L of water. A titration required 25.0 mL of 0.500 M NaOH to react completely with all the acid present. Assuming the unknown acid has one acidic proton per molecule, what is the molar mass of the unknown acid? What is the molecular formula of the unknown acid?