
Experiment 8 – Precipitation of Strontium Sulfate

In this experiment, you will study a precipitation reaction between sodium sulfate and strontium chloride. You will collect, dry, and weigh the precipitate and compare this experimental yield to the theoretical yield.

Procedure

Weigh a clean, dry, 100-mL beaker. Add about 0.25 g (0.350 g max!) of solid sodium sulfate to the beaker and weigh it again. Completely dissolve the sodium sulfate in about 20 mL of D.I. water. Add 5.0 mL of 0.50 M strontium chloride solution.

Putting the beaker in an ice-cold water bath. Your precipitate should settle to the bottom, leaving a relatively clear solution above it. Obtain a piece of filter paper and weigh it on the analytical balance.

Set up a vacuum filtration apparatus with a Büchner funnel and your weighed filter paper (your instructor will show you how). Using a stirring rod to guide the stream of liquid, pour the contents of the beaker into the Büchner funnel. Use your wash bottle (filled with D.I. water) to rinse any solid out of the beaker and into the filter. Make sure no precipitate remains in the beaker or on the stirring rod. Fill the beaker with 15 mL of D.I. water, swirl it around, and then pour it into the filter. Repeat the washing process, and then draw air through the funnel for a few minutes to help dry the crystals.

Turn off the vacuum, carefully remove the filter paper containing your precipitate with a spatula, and place it over a watch glass. Fill a 100-mL beaker half-way with water, place the watch glass with filter paper over the beaker, and heat to boil for twenty minutes to dry the precipitate (alternatively, you can place the watch glass with filter paper in a drying oven at 130 °C for twenty minutes). Allow to cool, then determine the mass of your precipitate.

Data and Calculations for Experiment 8

Be sure to record all numerical values to the correct significant figures and include units!

1. Weight of empty beaker _____
2. Weight of beaker and sodium sulfate _____
3. Weight of sodium sulfate _____

Show Calculation

Name: _____

Section: _____

4. Moles of sodium sulfate:

Show Calculation _____

5. Moles of strontium chloride

$$\text{moles SrCl}_2 = 5.0 \text{ mL SrCl}_2 \left(\frac{10^{-3} \text{ L SrCl}_2 \text{ solution}}{1 \text{ mL SrCl}_2 \text{ solution}} \right) \left(\frac{0.50 \text{ mol SrCl}_2}{1 \text{ L SrCl}_2 \text{ solution}} \right) =$$

Solve the Equation Shown _____

6. Write a balanced MOLECULAR equation for the reaction:

7. Write a balanced NET-IONIC equation for the reaction:

8. Weight of empty filter paper _____

9. Weight of filter paper and dried precipitate _____

10. Weight of dried precipitate (Actual Yield) _____

11. Determine the limiting reactant and excess reactant for your reaction.

Limiting Reactant: _____ Excess Reactant: _____

12. Calculate the Theoretical Yield (in grams) of strontium sulfate.

Show Calculation _____

Name: _____

Section: _____

13. Determine the percentage yield of your reaction.

Show Calculation _____

14. Briefly describe how you could have improved your percentage yield in this experiment.