Simple Stoichiometry Activity

Remember the formula for SRRs & DRRs:

A + BX 🡪 AX + B

AX + BY 🡪 AY + BX

This activity has two parts: (1) Investigating a SRR and (2) Investigating a DRR.

Part I: SRR

1. Obtain a piece of metal (Mg or Zn) and record its mass.
2. Put the metal sample into the test tube.
3. Measure out 5mL of HCl into a graduated cylinder and add it to the test tube.
4. Observe the reaction that takes place and document the evidence.
5. Write and balance the chemical equation.
6. Then determine how much product you should theoretically obtain.
7. Run the experiment until the metal sample has completely dissolved or until the bubbles stop.
8. Carefully pour the liquid into a 10mL graduated cylinder and record its volume.
9. Compare the results with your prediction.

As a class, we will determine percent yield and percent error.

Part II: DRR

Chemicals involved in DRRs are always aqueous, which means the compound has been dissolved in water. Cations and anions are switching places in DR reactions, so expect for the reactions to take place. Evidence that a DR reaction will take place: (1) color change, (2) temperature change, (3) gas bubbles or odor, and (4) formation of a precipitate (a solid). Number 4 is significant, as it is very likely that you will experience it several times with the chemical combinations. When a precipitate forms**, you must filter** the solutions so that you can separate the precipitate from the other compound.

1. Measure the mass of 1 piece of filter paper.
2. Measure 5mL of sodium hydroxide and place in a test tube.
3. Measure 5mL of copper (II) sulfate and add it to the test tube.
4. Observe the reaction that takes place and document the evidence.
5. Write and balance the chemical equation.
6. Then determine how much product you should theoretically obtain.
7. Run the experiment until the reaction stops (shouldn’t take long).
8. Filter the contents of the test tube.
9. Measure the amount of liquid that was filtered out into the beaker.
10. Carefully place the filter paper with the wet precipitate into the oven and dry for 5 minutes.
11. After drying, take the mass of the filter paper with the precipitate and subtract the mass of the filter paper. Record the mass.
12. Compare the results with your prediction.