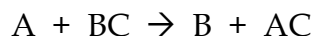

Chemical Reactions

Objective

You will be able to predict single and double replacement reactions. You will test your predictions by mixing specified pairs of solutions and observing your results. You will then write the molecular and net ionic equation for each observed reaction.

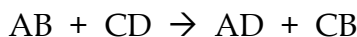
Introduction

A single replacement reaction results when a single element reacts with a compound. The general representation of a single replacement is:



In this general reaction, A replaces B, forming a new single element and a new compound.

A double replacement reaction results when two exchanges take place. The general representation of a double replacement is:



In this general reaction, A in the reactant AC replaces B in the reactant BD to form a new product AD. In like fashion, B in the reactant BD replaces A in the reactant AC to form a new product BC. Another name commonly used is metathesis reaction.

Materials

Micro-well Plate
Hydrochloric acid

Beral Pipets - 9
Magnesium metal

Group A Chemicals

Copper (II) nitrate
Iron (III) nitrate
Cobalt (II) nitrate
Nickel (II) nitrate
Hydrochloric acid

Group B Chemicals

Sodium carbonate
Sodium hydroxide
Sodium chromate
Sodium phosphate
Magnesium Metal

Procedures

Perform the following reactions. Write your observations. Write a molecular equation for each reaction. Write a balanced net ionic equation for each reaction. Use approximately 15 drops of each solution.

Reactions 1

- React each nitrate with sodium hydroxide.

Reactions 2

- React each nitrate with sodium phosphate

Reactions 3

- React each nitrate with sodium chromate

Reactions 4

- React each nitrate with sodium carbonate

Reaction 5

- React hydrochloric acid with magnesium metal
- Optional: Light a match and place over the mouth of the test tube.

Reaction 6

- React hydrochloric acid with sodium carbonate

Questions:

1. Where are the nitrate compounds located on the periodic table?
2. What do you notice about Group A chemicals?
3. What do you notice about Group B chemicals?
4. Does the sign of only a solid being formed identify that a chemical reaction has occurred? Justify your answer.