

Double Replacement Reactions

Name: _____

Period: _____

PURPOSE: To observe and practice writing down molecular, complete ionic, and net ionic equations for double replacement reactions.

THEORY: Most reactions in chemistry can be classified as one of two kinds: double replacement (metathesis) reactions or single replacement reactions. In a double replacement reaction, typically two aqueous solutions containing ionized or dissociated species are mixed. Consequently ions in the solutions are brought into contact with one another, with the possibility of creating a new compound that is either water (an acid base reaction), a gas, or an insoluble salt.

Before one can understand why chemical reactions occur, one must gain experience predicting, observing, and recording the results of many different reactions. Typically there are three kinds of equations that can be written down for a chemical reaction:

- 1) The **molecular equation**, in which all species are written together as formula units or molecules, but the dissociation or ionization of compounds is not explicitly noted.
- 2) The **complete ionic equation**, which directly illustrates which species are ionized or dissociated in solution.
- 3) The **net ionic equation**, which allows one to quickly determine what occurred in the reaction, as it is created by deleting all spectator ions from the complete ionic equation.

Today you will observe many chemical reactions and practice writing down these equations for each one.

MATERIALS:

0.1M solutions of the following:

Barium chloride

Potassium iodide

Copper(II) sulfate

Lead(II) nitrate

Zinc nitrate

Magnesium nitrate

Sodium bromide

Silver nitrate

Sodium phosphate

24 well plate (see figure below)

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1% Phenolphthalein solution

1.0 M solutions of the following

Sodium carbonate

Hydrochloric acid

Sodium hydroxide