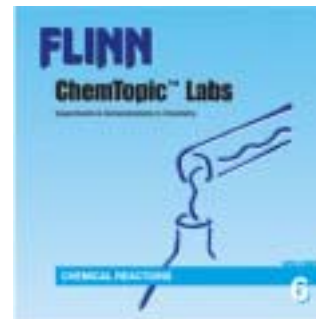


Chemical Reactions— Experiment Summaries and Concepts



Classifying Chemical Reactions—Analyzing and Predicting Products

Chemists try to make sense of the great variety of chemical reactions the same way that biologists organize their knowledge of life, by sorting reactions into groups and classifying them. Classifying chemical reactions allows us to predict what chemical reactions will occur when different substances are mixed. The purpose of this experiment is to observe a variety of chemical reactions, identify patterns in the conversion of reactants into products, and classify the reactions into different groups.

Double Replacement Reactions and Solubility—Net Ionic Equations

Precipitation reactions occur when aqueous solutions of ionic compounds are combined and a new ionic compound, which is insoluble in water, is produced. In this microscale experiment, students carry out a series of possible double replacement reactions and observe which combinations produce precipitates. Students write molecular and net ionic equations for the reactions and analyze the results to formulate general rules of solubility for ionic compounds.



A Four-Reaction Copper Cycle—Copper and Its Compounds

How old is the copper penny in your pocket? It may be older than you think! Recovery and recycling of copper scrap is a thriving industry. In this experiment, students carry out a sequence of chemical reactions in order to demonstrate the possibilities of copper recycling. The four-reaction copper cycle demonstrates the properties of copper and its compounds, illustrates different types of chemical reactions, and provides a great test of laboratory efficiency.

Chemical Reactions and Qualitative Analysis—An Inquiry Activity

To protect human health and safeguard the environment, the EPA regulates the amounts of barium, copper, iron, lead, silver, and zinc ions in drinking water. Qualitative analysis makes it possible to determine if these cations are present in water. In this inquiry-based experiment, students design a sequence of chemical reactions to separate and identify iron(III), silver, and zinc ions. Working out a successful qualitative analysis scheme helps students develop critical thinking and problem-solving skills.



Chemical Reactions Primer—Observation and Classification

Chemical reactions are the lifeblood of chemistry. Recognizing chemical reactions and “translating” them into chemical equations are essential skills students need in order to be successful in chemistry. Use this activity to help your students develop “chemical literacy” skills or to assess their understanding of the five basic types of reactions.

Concepts

- Chemical reactions
- Combination vs. decomposition
- Single vs. double replacement
- Combustion reactions

- Double replacement reactions
- Molecular equations
- Net ionic equations
- Solubility rules

- Oxidation–reduction
- Single replacement
- Double replacement
- Percent yield

- Chemical reactions
- Qualitative analysis
- Precipitation reactions
- Complex ion reactions

- Chemical reactions
- Combination vs. decomposition
- Single vs. double replacement
- Combustion reactions