



Figure 6.1 A synthetic chemist formulates new compounds (A). Then, an analytical chemist analyzes the compounds to verify their structure and percent composition (B).

6-1A Comparing Chemical Reactions

Find Out ACTIVITY

In this activity, you will observe and compare three similar chemical reactions.

Safety



- Avoid touching all reactants and products.
- Wash your hands and equipment thoroughly after completing this activity.
- Do not remove any materials from the science room.
- Follow your teacher's directions for safety in the science room.

Materials

- copper(II) chloride solution
- four medium-sized test tubes
- test tube rack or four small beakers
- strip of magnesium
- iron nail
- zinc metal (mossy)
- copper wire
- paper towel

What to Do

1. Place copper(II) chloride solution into four medium-sized test tubes to a depth of about 1 cm. Set the test tubes in a test tube rack or small individual beakers so that you can easily see the bottom of the test tubes.
2. Place each metal (magnesium strip, iron nail, zinc, copper wire) into a different test tube. Tilt each test tube to allow the metal to be in contact with the solution.
3. Observe each chemical reaction. Record what happens to the metals and any colour changes in the solution.
4. Design a table of observations. Organize your observations in the table. Give your table a title.
5. After a few minutes, carefully pour off the copper(II) chloride solution from each test tube into a waste container, as directed by your teacher. Leave the solid products in the test tubes. Do not pour the copper(II) chloride down the sink as it can harm the environment.
6. Pour the products out onto a paper towel. Compare the products, but do not handle them.
7. Clean up and put away the equipment you have used. Follow your teacher's instructions for disposal of wastes.

What Did You Find Out?

1. What metal do you think was produced in the following chemical reactions?
 - (a) magnesium plus copper(II) chloride
 - (b) iron plus copper(II) chloride
 - (c) zinc plus copper(II) chloride
2. (a) Describe what you observed in the test tube containing the copper wire.
(b) Suggest a reason for your observations.
3. List at least one way in which the reactions involving Mg, Fe, and Zn appeared to be different from each other.