



Conservation of Mass

OBJECTIVES

- *Observe* the signs of a chemical reaction.
- *Compare* masses of reactants and products.
- *Design* experiments.
- *Relate* observations to the law of conservation of mass.

MATERIALS

- 2 L plastic soda bottle
- 5% acetic acid solution (vinegar)
- balance
- clear plastic cups, 2
- graduated cylinder
- hook-insert cap for bottle
- microplunger
- sodium hydrogen carbonate (baking soda)



FIGURE A Slowly add the vinegar to prevent the reaction from getting out of control.

BACKGROUND

The law of conservation of mass states that matter is neither created nor destroyed during a chemical reaction. Therefore, the mass of a system should remain constant during any chemical process. In this experiment, you will determine whether mass is conserved by examining a simple chemical reaction and comparing the mass of the system before the reaction with its mass after the reaction.

SAFETY



For review of safety, please see **Safety in the Chemistry Laboratory** in the front of your book.

PREPARATION

1. Make two data tables in your lab notebook, one for Part I and another for Part II. In each table, create three columns labeled “Initial mass (g),” “Final mass (g),” and “Change in mass (g).” Each table should also have space for observations of the reaction.

PROCEDURE—PART I

1. Obtain a microplunger, and tap it down into a sample of baking soda until the bulb end is packed with a plug of the powder (4–5 mL of baking soda should be enough to pack the bulb).
2. Hold the microplunger over a plastic cup, and squeeze the sides of the microplunger to loosen the plug of baking soda so that it falls into the cup.
3. Use a graduated cylinder to measure 100 mL of vinegar, and pour it into a second plastic cup.
4. Place the two cups side by side on the balance pan, and measure the total mass of the system