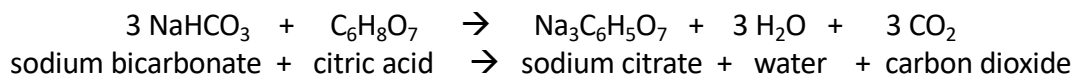


Chemistry Lab: The Law of Conservation of Mass

Introduction:

The ingredients for Alka-Seltzer found in the tablets include solid forms of citric acid and sodium bicarbonate (baking soda). When a tablet is dropped in water the water dissolves the solid form of the acid and the baking soda allowing them to mix and react. The result is a reaction that produces carbon dioxide gas (CO₂).

The chemical equation for this reaction is as follows:



The law of conservation of mass states that in any physical or chemical process, matter is neither created nor destroyed, but is conserved. In other words, the mass of the reactants will equal the mass of the products.

Materials:

- clean 16 oz. water or drink bottle with cap (soft drink bottles work best)
- water
- electronic balance
- small piece of Alka-Seltzer (about ¼ of a tablet)

Safety: Goggles required for this station!

Procedure:

1. Fill the bottle about ½ full with water. Place the cap on the bottle upside down. Place the Alka-Seltzer piece in the cap. Find the mass of both the bottle, the cap, and the Alka-Seltzer tab. Record the mass in your data table. This is the total mass of the system.
2. Turn the cap over, allowing the Alka-Seltzer to drop into the water. Screw on bottle cap securely.
3. After the reaction stops, find the mass of the total system and record in the data table.
4. Take the bottle cap off. Gently and slowly squeeze the bottle in at the center of the bottle. This will cause the water level to rise. Continue squeezing the bottle until the water level has risen into the neck of the bottle. Be careful to not let any of the water escape the bottle.
5. Keeping the bottle squeezed in, securely replace the bottle top. The bottle will be stay squeezed in.
6. Find the mass of the bottle, cap, and water. Record this mass in your data table.
7. Perform two more trials, and calculate averages for the experiment.

Clean up: Make sure that all supplies for this station are returned to order. Rinse out the bottle down the drain, and return the balance to zero. Don't leave anything on the balance.