

Procedure for Heating Different Amounts of Food

To determine the temperature increase for different amounts of food caused by a fixed amount of reactants, an investigation was conducted using water as a substitute for food. All of the saltwater, aluminum (Al), and copper sulfate (CuSO_4) were allowed to come to room temperature overnight. The step-by-step procedure is outlined below.

1. Different amounts of water (25 g, 50 g, 75 g, or 100 g) were added to a small container. This represents our "food."



2. The small container of water was nested inside the top of a styrofoam cup containing the saltwater. The small cup of "food" sat just above the surface of the saltwater (did not touch the salt water). A magnetic stir plate and magnetic stir bar were used to continuously mix the contents of the styrofoam cup.



3. A wireless temperature probe connected to a computer was placed through the lid of the small container. A rubber band was used to set the position of the temperature probe, so the tip sat in the center of the water when the lid and temperature probe were placed on the small container.



4. The small container with "food" was gently lifted off of the styrofoam cup, and the CuSO_4 and then Al were added. The small container was quickly placed back on top of the styrofoam cup, and the "Start" button on the computer was clicked to collect temperature data every 30 seconds until the temperature reached a maximum and began to decrease.



5. ***The same amounts of saltwater, CuSO_4 , and Al were used each time.*** Steps 1-4 were repeated 3 times for each amount of "food." The maximum temperature increase for each trial was determined and used to calculate the average maximum temperature change for each amount of "food."