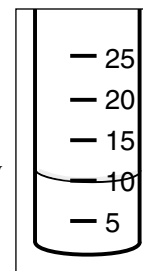


Change in temperature—Endothermic reaction

Aside from bubbling, what else happens during a reaction between baking soda and vinegar?

You have seen that mixing baking soda and vinegar produces a gas. This bubbling is a sign that something new was produced. In this activity, you will combine baking soda and vinegar again. But this time you will use a thermometer to see if the temperature changes during this reaction.

In the procedure below you will use a graduated cylinder to measure 10 ml of vinegar. When measuring, you need to make sure your eye is level with the 10 ml mark. Then carefully add a little bit of vinegar to the graduated cylinder. You may notice a little curve at the top of the vinegar. This is called the *meniscus*. Keep watching the level of the vinegar as you add more. Stop adding vinegar when the bottom of the *meniscus* touches the 10 ml line.



Procedure

1. Use a graduated cylinder to measure 10 ml of vinegar and pour it into a clear plastic cup.
2. Place a thermometer in the vinegar. Read the thermometer and record the temperature in the chart below.
3. While the thermometer is in the cup, add $\frac{1}{2}$ teaspoon of baking soda.
4. Watch the thermometer to observe any change in temperature. Record the lowest temperature reached in the chart below.



| | Temperature |
|---|-------------|
| Before adding baking soda | |
| After adding baking soda | |
| Change in temperature | |
| Did the temperature increase or decrease? | |

When two or more substances are mixed together and the temperature changes, this is a clue that a chemical reaction has occurred. When the temperature decreases during a chemical reaction, it's called an *endothermic* reaction.