California State University of Bakersfield, Department of Chemistry

Mentos and Diet Soda Experiment

Standards:

5-PS1-3. Make observations and measurements to identify materials based on their properties.

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.

Introduction:

Soda is a carbonated drink that we are all familiar with. It's fizzy and bubbles up when we open up a fresh bottle of it. When a very familiar candy, Mentos, is added into a fresh bottle soda, little pockets of air react with the surface of tiny particles of sugar and xanthan gum in the candy to create a very tall and fizzy reaction.

Materials:

- Diet Soda (Diet Coke and Diet A&W Root Beer work best)
- regular mint Mentos (about 5 or 6)
- drill
- sewing string
- 1 bead
- Several caps that fit on your preferred diet soda
- X-acto fixed blade or something similar
- Long, round filing tool

Safety:

- Have an adult assist you when performing this experiment.
- Wear lab goggles and an apron to avoid getting fluids in your eyes and on clothing.
- Stand back after adding the Mentos into the soda; it erupts immediately.
- Be careful when handling the drill bit and X-acto blade. They can both cause serious harm.

Procedure:

1. Drill a hole into the center of the soda caps and into the center of the Mentos.
2. Use the X-acto blade to cut off any remains left on the inner side of the cap.
3. Each cap will have a different hole size; use the X-acto blade to cut the holes to preferred size and use the filing tool to make it round and neat.
4. Place a string through a bead and tie it.
5. Put the Mentos through the string, leaving the bead at the end of the string. (The bead will be a bit larger than the holes in the Mentos and will act as a stopper so they don't come off.)
6. Place the cap at the top of the Mentos and pull the string so the Mentos are pressed beneath the cap.
7. Take off the cap on the soda and replace it with the cap that has the Mentos.
8. Seal tightly and hold onto the string.
9. Drop the string when ready and stand back.

Data and Observations:

What did you see? Anything you were not expecting?

Questions:

What kind of reaction is this, physical or chemical? (The big Mentos debate).

What changes can be made to enhance the reaction and control its duration?

References:

Steve Spangler. Mentos Diet Coke Geyser. Steve Spangler Science. http://www.stevespanglerscience.com/lab/experiments/original-mentos-diet-coke-geyser (accessed July 31, 2013).