



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Sabrina Bluml; Shruti Chand	Project Number J0605
Project Title How to Produce the Most Fizz with Bath Bombs	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective of the experiment was to change the relative amounts of sodium bicarbonate (baking soda) and citric acid in bath bomb recipes to produce the optimum amount of fizz that is released once the bath bomb touches water. It was expected that a mixture of approximately 0.76 grams of citric acid for every gram of baking soda would produce the most fizz. This hypothesis was based on the chemical reaction formula.</p> <p>Methods There were six recipes that changed the relative amounts of sodium bicarbonate and citric acid, and all the other ingredients were kept constant. The fizz was measured using a jar filled with water and a cap with a balloon attached to the top. As the bath bomb was dropped in the water, the cap would immediately be screwed on. A video was recorded for each experiment and then later reviewed to determine how much time it took for the balloon to fill. The shortest times showed the most carbon dioxide and fizz produced.</p> <p>Results The shortest time was observed for a mixture of 1:0.78 (by weight) citric acid to baking soda with an average time of 3.7 seconds. The longest time came from 0.22:1 (by weight) citric acid to baking soda with an average time of 6.7 seconds.</p> <p>Conclusions The result of the experiment is consistent with a chemical reaction where three baking soda (84 g/Mol) molecules react with one citric acid (192 g/Mol) molecule. The closer a mixture comes to this ratio, the more fizz and carbon dioxide is released.</p>	
Summary Statement This experiment tested different recipes that changed the relative amounts of baking soda and citric acid in bath bombs to produce the most carbon dioxide.	
Help Received My partner and I completely developed the concept of the experiment and did the project on our own. However, we received help from my dad on making sure our ratios for measurements were correct.	