

# Chemistry of bath bombs essay sample

[Science](#), [Chemistry](#)



Introduction – When sodium bicarbonate and citric acid mix in water they dissolve, the sodium bicarbonate reacts with the citric acid to form sodium citrate and carbon dioxide. The carbon dioxide then bubbles out as a gas, which makes the bath bomb break up, in this experiment 3 tests will be conducted in order to find the correct ratio of bicarbonate soda and citric acid to create the perfect bath bomb. Background information – The reaction rate is the speed of reaction for a reactant or product in a particular reaction is intuitively defined as how fast or slow a reaction takes place. Reactions happen faster when the concentration is higher because more reactant molecules are available and therefore the collisions between reactant molecules are more likely. Aim – The aim of this experiment is to create an effective amount of carbon dioxide by mixing enough bicarb and citric acid to create the perfect bath bomb, to demonstrate a chemical reaction that produces a gas when reactants are in the correct state. Hypothesis – I hypothesise that we will need 5g of bi-carb and 3 grams of citric acid to create the perfect bath bomb

### Materials and Methods

Beaker (min. of 2)

60g bicarbonate of soda

30g citric acid

Electronic scale

Thermometer

Water (room temperature)

Stopwatch

Safety Glasses

### Method:

1. The beaker was filled with 100mls of room temperature water
2. The water was then measured using a thermometer
3. 1 gram of citric acid was placed in the beaker
4. 5 grams of bicarb was placed in the water-filled beaker
5. The timer was started as soon as the two ingredients were added
6. Steps 1-5 were repeated twice more

Steps 1-5 were repeated with 2 grams of citric acid and 5 grams of bicarb

Steps 1-5 were repeated with 3 grams of citric acid and 5 grams of bicarb

This experiment, Chemistry of Bath Bombs was overall mostly controlled by using repetition; conducting all 3 trials in one room, with the same temperature in one lesson, controlled the temperature of the room. We measure the correct amount each time to ensure that nothing could have changed unless need be.

### Risk Assessment

Risk

Prevention

Glass Breaking

Careful handling with two hands at all times

Pull rather than push on the glass

Spilling Chemicals

Standing up during the experiment will ensure that if the chemicals should spill they will spill onto the floor rather than skin. Use of safety goggles

Long haired tied back

Small amounts wherever possible

Hot Plate (burns)

Long hair tied back

Do not touch the plate

Always have access to cold water and an eye bath/shower

Results

Discussion

This experiment is an example of a common chemical reaction. The balanced chemical equation for bicarbonate soda and citric acid mixed into water is  $3\text{NaHCO}_3 + \text{OH-C}-(\text{COOH})_3 \rightarrow \text{OH-C}-(\text{COO} / \text{Na})_3 + 3\text{CO}_2 + 3\text{H}_2\text{O}$ . Every Water temperature before the experiment started was 21 degrees, the average time for the rate of reaction was 10 seconds, The hypothesis we will need 5g of bi-carb and 3 grams of citric acid to create the perfect bath bomb was correct. This was proven in the experiment when 5g of bicarb and 3g of citric acid was mixed with water, this mixture took the longest time to react and therefore would be a better product as a bath bomb.

The first two experiments where 1-2 grams of citric acid was used shows that the average rate of the reaction was 10 seconds, however, when 3 grams of citric acid was used; the reaction took around 3-4 seconds more than the average. The factors that may affect the accuracy of the data include incorrect timing, incorrect measuring of the temperature and the amount of substances. The data was collected in one lesson over a period of approximately 50 minutes to ensure the data was accurate as possible. The data could've been improved by ensuring the timing was exact, the 100ml of

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water measure could have been more precise, and the 5g of bicarb and 3g of citric acid could have been exact by taking more time.

## Conclusion

The findings of this investigation are that the appropriate amounts of chemicals needed to create the perfect bath bomb are, 5 grams of bicarbonate soda and 3 grams of citric acid. Three experiments each with different amounts were conducted to find these results and it was decided that the best bath bombs should take the longest time to react. As seen in the results the experiment which took the longest time to react was the 3rd one (5 grams of bicarbonate soda and 3 grams of citric acid). Overall the experiment was a success as we found the correct ratio of bicarb and citric acid to create the perfect bath bomb

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Image:

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