

DR. CHRISTOPHER'S

CHEMICAL REACTION EXPERIMENT INSTRUCTIONS



Background Information

Chemical Reaction - Occurs when you combine substances and create completely different substances as their atoms rearrange

The chemical name for baking soda is sodium bicarbonate and it's formula is **NaHCO₃**.

The molecular formula for citric acid is **C₆H₈O₇**

When baking soda and citric acid are combined with water (**H₂O**), all of the molecules rearrange in a chemical reaction. See Figure 1 below for the chemical equation.



Figure 1

Endothermic Reaction -A chemical reaction in which heat is absorbed (generally causes the temperature to drop)

Watch the Video
on Youtube



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Chemical Baggie Experiment

Estimated Time to Complete: 10 minutes

Supplies Needed

- Safety Glasses
- Baking Soda
- Citric Acid (*this can be purchased at the grocery store*)
- A Plastic Baggie
- Water

Tools Needed

- A teaspoon
- ¼ cup measuring cup

1. Add one **teaspoon** of **baking soda** to the **plastic baggie**.
2. Add one teaspoon of **citric acid**
****Next steps are time sensitive, consider asking an adult for help****
3. Add **¼ cup** of **water** to the baggie.
4. Seal the baggie quickly.

Record Your Observations



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Bath Bomb Chemistry

Estimated Time to Complete: 1 day

Supplies Needed

- Baking Soda
- Citric Acid
- Epsom Salt
- Cornstarch
- Vegetable Oil
- Water
- Fragrance Oil
- Food Coloring

Tools Needed

- A couple droppers
- Some type of mold (*ex. disposable snack container, flexible ice tray, etc.*)
- 2 Bowls
- 2 large spoons
- 1 Fork
- Measuring Spoons

Dry Ingredients

1. Add 6 Tablespoons (Tbs) of **Baking Soda** to one **bowl**. (*Try to make sure it is a level spoon*)
2. Add 3 Tablespoons of **Citric Acid**
3. Add 4 and a half Tablespoons of **Cornstarch**. You will need both the Tablespoon (Tbs) and the half tablespoon ($\frac{1}{2}$ Tbs)
4. Add 1 and a half Tablespoons of **Epsom Salt**.
5. Stir ingredients together with a large **spoon**.
6. Set bowl and ingredients aside.

Wet Ingredients

1. Add 2 and one quarter teaspoons (tsp) of **water** to a **different bowl**. You will need the teaspoon marked (tsp) and the quarter teaspoon marked ($\frac{1}{4}$ tsp).
2. Add 2 and one quarter teaspoons of **vegetable oil** to the bowl.
3. Select a **fragrance** for your bath bomb.
4. Add 2 Tablespoons of your fragrance to the bowl.
5. Select a color for your bath bomb.
6. Add 5 drops of **food coloring** to the bowl.
7. Stir the ingredients with a fork.



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Combining Ingredients

A Note: This part is can be tricky because the dry ingredients will react with each other when they get wet. But, we need to add some of the wet ingredients to add the fragrance, color, and get the dry ingredients to stick together. But, if they get too wet, they will be difficult to mold, and the fizzy reaction won't happen when you drop them into the bathtub.

1. Add one dropper full of wet ingredients to the dry ingredients. (Please note: one dropperful is not one drop)
2. If you see the chemical reaction starting to take place, push down the bubbles with the back of a spoon.
3. To test your consistency, press it between your fingers and see if it holds its shape. If it does, it is ready. If it is too dry, it will crumble in your fingers. If it is too wet, you won't be able to mold it.
4. Continue adding one dropper of liquids at a time. You will use most, but not necessarily all of the liquid.
5. Once you get your mixture to a good consistency, add one drop of **vegetable oil** into your **mold**.
6. Rub it on the inside of the mold
7. Spoon your bath bomb mixture into your mold and press it down as you go.
8. Set it aside and let it dry overnight
9. Carefully remove the bath bomb from the mold.

Record Your Process - What scent did you choose? What color?

