

Lava Lamp

www.dauids-bio.com (Custom Antibodies)

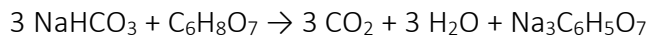
www.dauids-science.de (Lab Material)

- 1 - Introduction

The Baking Soda and Citric Acid Lava Lamp is a fun and visually appealing experiment that demonstrates a chemical reaction between baking soda (sodium bicarbonate) and citric acid, producing carbon dioxide gas (CO₂). This gas creates bubbles that cause a colorful liquid to move, resembling a lava lamp. This experiment helps illustrate the concepts of chemical reactions, gas formation, and density differences.

Chemical Details

The experiment demonstrates a chemical reaction between baking soda (sodium bicarbonate) and citric acid, which produces carbon dioxide gas (CO₂), water (H₂O), and sodium citrate (Na₃C₆H₅O₇). The CO₂ gas forms bubbles that carry the colored water through the oil, creating the characteristic "lava lamp" effect.



Let's get started and have some fun with science!

- 2 - Materials

Material

Baking Soda (Natron)

Citric acid

Water

Vegetable oil

OPTIONAL: Food Coloring

Safety Equipment

- 3 - Experiment

Add Baking Soda & Citric Acid:

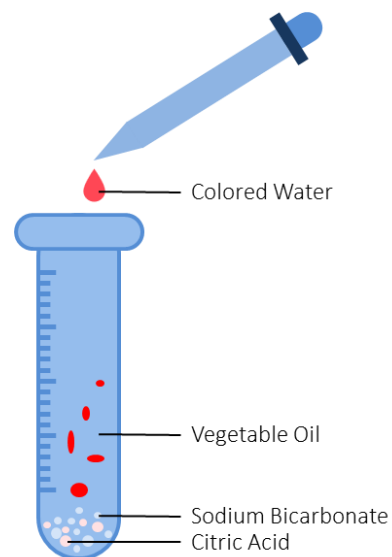
- Add about 1-2 tablespoons of baking soda to the bottle.
- Add 1 – 2 tablespoons of citric acid to the bottle.

Add Oil:

- Fill the bottle with the baking soda/citric acid mix with vegetable oil.
- You may fill two-third of the bottle with oil

Add Colored Water:

- You may want to prepare colored water (food colors).
- Carefully pour the water into the bottle with the vegetable oil.
- The water will sink to the bottom, forming a separate layer under the oil due to their different densities.
- The water will come in contact with the citric acid and the baking soda, which will start the reaction.



Initiate the Reaction:

- Observe the reaction as the citric acid reacts with the baking soda to produce carbon dioxide gas.
- The gas bubbles will rise through the water and oil, creating the lava lamp effect as the colored water moves with the bubbles.

Improvements:

- The reaction might be stronger, when you solve the citric acid in water and add it at the end, after you added the colored water.
- You may start with a small laboratory reaction tube instead of a large bottle to check if everything works as intended.

- 4 - Additional Information & Safety Instructions

All individuals conducting the experiments outlined in this protocol must thoroughly review and adhere to all safety instructions and guidelines. It is imperative that each person reads the Material Safety Data Sheets (MSDS) for every chemical involved prior to commencing any experiment. Failure to follow proper safety procedures can result in serious injury or harm. The responsibility for ensuring a safe working environment lies with each individual participant. The author and distributor of this protocol assume no liability for accidents, injuries or damages resulting from the misuse of the information provided.

The author and distributor of this protocol do not guarantee that the information provided is accurate or complete. It is the user's responsibility to verify the information and ensure compliance with all applicable regulations and standards. The author and distributor assume no liability for accidents, injuries, or damages resulting from the use or misuse of the information provided.

Important Safety Notices:

- Wear safety goggles and gloves to protect your eyes and skin.
- Handle acids with care as it is a caustic substance and can cause burns.
- Perform the experiment in a well-ventilated area or under a fume hood.
- Dispose of chemicals properly after the experiment.
- Read and follow the MSDS for all chemicals