

Poppers! - A Kinetics Investigation

Design of Experiment

Research Question: What affect does temperature, concentration and surface area have on the rate of reaction of Alka-Seltzer tablets?

Problem Definition: You will carefully design experiments to test the three variables mentioned in the research question. Each experiment should be designed to control all variables *except* the factor being examined. Each variable should have at least 3 data points (i.e. 3 trials).

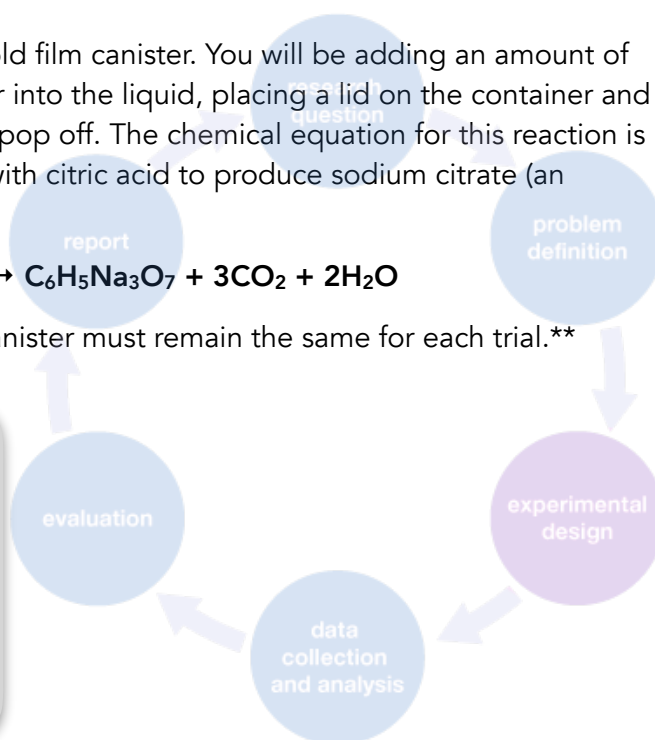
Your reaction vessel (container) will be an old film canister. You will be adding an amount of liquid to the canister, dropping Alka-Seltzer into the liquid, placing a lid on the container and then timing how long it takes for the lid to pop off. The chemical equation for this reaction is shown below. Sodium bicarbonate reacts with citric acid to produce sodium citrate (an antacid) and carbon dioxide.



****The amount of liquid in the film canister must remain the same for each trial.****

Materials:

- Thermometer
- Graduated Cylinder
- Stopwatch
- Film Case (with cover)
- Water
- Alka-Seltzer Tablets
- Vinegar



Experimental Design: Write out your procedure (can be step-wise) for each experiment on the back of this sheet, then present your plan to me. We'll discuss your design and modify it as necessary. I recommend doing this in pencil!

Following this, you will either carry out the experiments, collect the resultant data, analyze that data and then evaluate the research question.

Report: Write a conclusion which states the relationship between the factor being tested and the rate of reaction. You **MUST** included quantitative data from your experiments (modeled by me or carried out by you) to support your statements.

Name: _____

Date: _____

Experimental Design:

Conclusions: