Reaction Rates

Background
The two main ingredients in Alka-Seltzer are citric acid and sodium bicarbonate, an acid and base. When these substances react, one of the products is carbon dioxide gas.

Procedure
Using Alka-Seltzer antacid tablets, design experiments to study how temperature, particle size, and concentration affect the rate of reaction.

Rules:
1. All procedures must be approved by your teacher.
2. Be specific about your procedures.
3. Only vary one variable.
4. Make sure all containers are clean and dry before starting the experiment.

Before you begin:
Place one Alka-Seltzer tablet in a container. Add 20 mL of water. Observe the reaction.

Part I: Temperature’s effects on reaction rate
Write a procedure to test the effect of temperature on rate using the Alka-Seltzer and water reaction you just carried out. Your teacher must approve your procedure before you can carry out the experiment.

Predictions

Observations

Was your prediction correct?

Write a statement that describes the effect of temperature on reaction rate.

Part II: Particle size’s effect on reaction rate
Write a procedure to test the effect of particle size on rate using the Alka-Seltzer and water reaction you just carried out. Your teacher must approve your procedure before you can carry out the experiment.

Predictions

Observations

Was your prediction correct?

Write a statement that describes the effect of particle size on reaction rate.
water reaction you just carried out. Your teacher must approve your procedure before you can carry out the experiment.
Procedure                  (teacher’s initials)

Prediction

Observations

Was your prediction correct?

Write a statement that describes the effect of particle size on reaction rate.

PART III: Concentrations effects on reaction rate
Baking soda is sodium bicarbonate. Vinegar is acetic acid in water. These chemicals react to produce carbon dioxide gas, the same product released by the Alka-Seltzer tablet in water. Place a small amount of baking soda two containers. Pour 10 mL of water in one container and 10 mL of vinegar in another container. Make observations.
Observations

Design an experiment to see how the concentration of vinegar effects the reaction rate.
Procedure                  (teacher’s initials)

Prediction


Observations

Was your prediction correct?

Write a statement that describes the effect of concentration on reaction rate.

To clean up: Pour solutions down the sink. Clean and **dry** all containers.