

Name: _____

Date: _____

Activity Sheet

Chemical Reactions and Mass Conservation

Aim:

To observe a chemical reaction and test the law of conservation of mass.

Discussion:

What is a chemical reaction?

Materials:

- 500 mL Bottle
- Vinegar
- Beaker
- 4 pieces of chalk
- pH paper
- Graduated Cylinder
- Electronic Scale

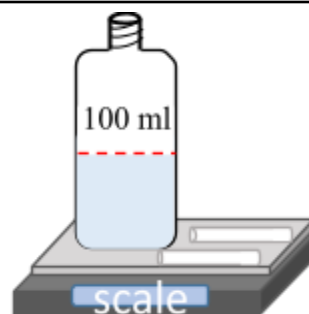


Figure 1. Place chalk, and vinegar-filled bottle on the scale.

Method (Part 1): Cap Off

- ___ 1. Measure out 100 ml of vinegar using a graduated cylinder and pour into the bottle.
- ___ 2. Tear off a strip of pH paper. Dip one half of the pH paper into the bottle. Use the pH chart to find out the pH.

Initial pH:

- ___ 3. Zero the scale by making sure nothing is on the scale and pressing 'Tare'.
- ___ 4. Place two pieces of chalk, the vinegar-filled bottle (**no cap!**) onto the scale. Measure the starting mass in your results table. **Do not put the chalk in the bottle yet!**

Starting Mass:

 grams


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- ___ 5. Place the two pieces of chalk into the bottle. Time and measure the mass every 60 seconds and record in your results table.

Results Table: Reaction with Cap Off

Time (sec)	0	60	120	180	240	300	360
Mass (g)							

- ___ 6. Rip off another piece of pH paper and dip it in the bottle. Use the pH chart to find out the pH. Record this number in your results table.

Final pH:

Questions:

What signs of a chemical reaction did you observe?

Did the color of the pH paper change? If it did, explain what happened?



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Method (Part 2): Cap On

- ____ 1. Clean out the bottle in the sink and rinse with water. Measure out 100 ml of vinegar using a graduated cylinder and pour into the bottle.
- ____ 2. Place two pieces of chalk, the vinegar-filled bottle, and cap onto the scale, as shown in Figure 1. This is your mass at time 0 seconds. **Do not put the chalk in the bottle yet!**

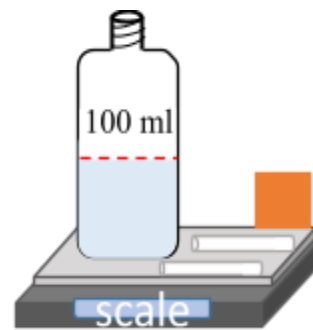


Figure 1. Place chalk, vinegar-filled bottle, and cap on the scale.

Starting Mass:

grams

- ____ 5. Place the two pieces of chalk into the bottle and tightly seal the container with the cap. Time and measure the mass every 60 seconds and record in your results table.

Results Table: Reaction with Cap Off

Time (sec)	0	60	120	180	240	300	360
Mass (g)							

- ____ 4. Rinse out the bottles and clean up your lab area.

Questions:

Did the mass of either bottle change? Explain why or why not!



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Calculate the change in mass for each time interval. Show your work.

Interval (sec)	Final - Starting Mass (g)	Change in Mass (g) Cap on	Change in Mass (g) No Cap
0 - 60	60s Mass - 0s Mass		
60 - 120	120s Mass - 60s Mass		
120 -180	180s Mass - 120s Mass		
180 -240	240s Mass - 180s Mass		
240 -300	300s Mass - 240s Mass		
300 -360	360s Mass - 300s Mass		

Graph:

Make a line graph for both experiments, showing the Time (x-axis) vs. Change in Mass (y-axis). Be sure to include a key. Can you determine the rate of reactions?



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Change in Bottle Mass Over Time

