Temperature & Chemical Reaction Rate Lab

Name_____ **Date**_____ **Block** _____

Problem: Does temperature affect the reaction rate of Alka-Seltzer?

Hypothesis:

_____

_____

Variables: By the time you finish this experiment, you will need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.

Independent Variable: _____

Dependent Variables: _____

Controlled Variables: _____

Materials:

Beaker
Thermometer
3 Alka-Seltzer tablets (*Each tablet broken into fourths*)
Timer
Mortar and pestle
Water – Cold, Hot, Room Temperature

Procedures:

A. Hot Water

1. Fill a beaker with 250ml of hot water.
2. Use the thermometer to take the temperature and record it on your data sheet.
3. Drop a quarter of an Alka-Seltzer tablet into the hot water.
4. Measure the time required for tablet to fully dissolve.
5. Be prepared to start and stop on time. Record the time.
6. Repeat 4 times.

B. Room Temperature Water

1. Fill a beaker with 250ml of room temperature water from the sink.
2. Use the thermometer to take the temperature and record it on your data sheet.
3. Drop a quarter of an Alka-Seltzer tablet into the water.
4. Measure the time required for tablet to fully dissolve.
5. Be prepared to start and stop on time. Record the time.
6. Repeat 4 times

C. Cold Water

1. Fill a beaker with 125 ml of water from the sink.
2. Add enough ice to adjust the level to 250ml.
3. Stir the ice water for about 15 seconds so the temperature will come to equilibrium.

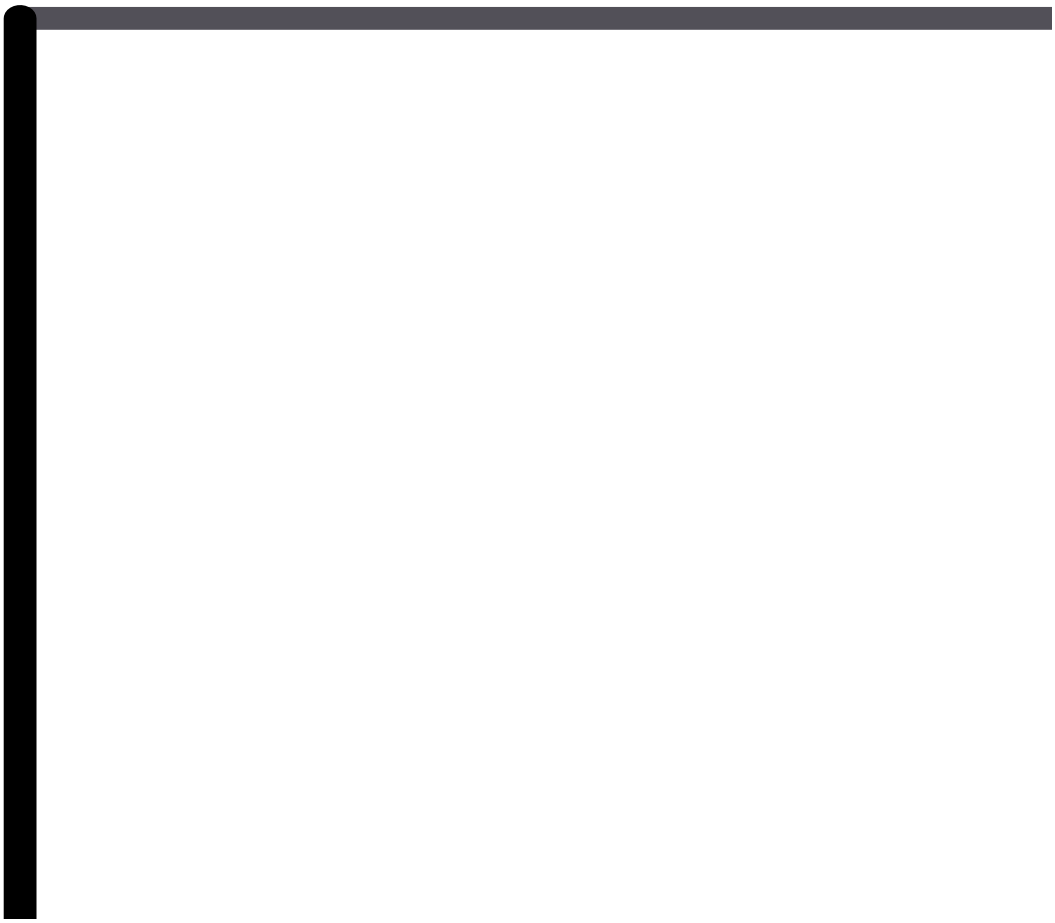
4. Use the thermometer to take the temperature and record it on your data sheet.
5. Drop a quarter of an Alka-Seltzer tablet into the water.
6. Measure the time required for tablet to fully dissolve.
7. Be prepared to start and stop on time. Record the time.
8. Repeat 4 times

	Cold Water Temp	**Cold Water RXN Time**	**Room Temp Water Temp**	**Room Temp Water RXN Time**	**Hot Water Temp**	**Hot Water RXN Time**
Trial 1						
Trial 2						
Trial 3						
Trial 4						
Average						

Qualitative Observations: (What is seen, heard, smelled, etc… Also were there any accidents or things that could have impacted the data?)

Graph: Graph your data points (water temperature vs. time to fully dissolve) to show the effect of temperature on Rate of Reaction.

Title_____



Questions:

Answer in complete sentences

1- What is a chemical reaction?

_____

_____

2- What is the difference between an endothermic & exothermic reaction?

_____

_____

3- What evidence is there that this is a chemical change?

_____

4- As the temperature increases, the rate of reaction _____.

5- When analyzing graphs, we look for patterns. If both the independent & dependent variables increase or if they both decrease we call this a positive correlation/relationship. But if one variable increases and the other decreases, we call that a negative correlation/relationship. Looking at your graph, what type of relationship exists between the temperature and the reaction rate?

_____

Overall Conclusion:

1- State if your original hypothesis was correct or incorrect. This should be based on the best information collected from the experiment.
2- If it was incorrect, give the correct answer, again based on the best information collected from the experiment.
3- Include a brief summary of the data collected during the experiment telling how it supports your answer for the hypothesis.
4- **Sources of Error** Identify two things that people may have done incorrectly that would have caused them to get totally different answers from the rest of the class. These errors must be unique, in other words they have not been applicable in previous labs. They must be new sources of error. Be specific about what might have been done.

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