

"PLOP, PLOP, FIZZ, FIZZ" ... RATE OF REACTION ACTIVITY

Document this lab activity in your Laboratory Book in standard format. This activity is to be done in student groups of 2 *ONLY*. Construct a Data Table as follows:

Name:			Lab Partner:			Lab#:		Per:	Date:
RATE OF REACTION ACTIVITY									
Room Temperature Water			Ice Water			Warm Water			
Trial	Tablet	Time (s)	Trial	Tablet	Time (s)	Trial	Tablet	Time (s)	
1	whole		4	whole		7	whole		
2	pieces		5	pieces		8	pieces		
3	powder		6	powder		9	powder		

EQUIPMENT:

1 50 mL beaker ~ 1 paper towel
 1 dropper ~ 1 film canister w/cap
 Hot plate ~ Beaker of WARM water
 Timing Device and Waste Beaker



REAGENTS:

3 Alka-Seltzer Tablets (or other generic effervescent product)
 tap or room temperature water, warm water and ice water

Directions:

- Score an X on the back and break each of your tablets into FOUR pieces for the 8 (minimum) trials you will be conducting. (You have been given enough to do 12 trials ~ record ALL results)
- Add approximately 20 mL of room temperature water into your film canister (about 2/3 full) and drop one-fourth tablet into the water inside the canister, quickly cap and begin timing the reaction. Upon completion of the reaction, record the time in seconds. Dispose of the used solution in the canister into your waste beaker (or sink) to begin each trial.
- Repeat this procedure for Trial 2 but now break the quarter tablet broken into pieces. For Trial 3 grind the quarter tablet into powder.
- Upon completion of the 3 trials with tap water, repeat your experiments (*trials 4, 5, 6*) this time with ice water and then finally with warm, *not* boiling water (*7, 8, 9*). Record your data in the data table.

Questions: (Use your textbook as a reference)

- What is the definition of Rate of Reaction?
- What is activation energy? Draw a diagram showing the activation energy of a reaction. Label all axes and the E_a as well as indicating whether this is an exo- or endothermic reaction representation.
- What is a catalyst and how does it affect the rate of reaction?

Conclusion:

Review your data and write a conclusion statement in your own words. State the relationships you observed regarding the rate of reaction of the experiments done with room temperature, ice and warm water as well as the relationship between the particle size; whole, pieces or ground powder. What would be the optimum conditions for the highest reaction rate?

California Content Standards for Chemistry: Reaction Rates

8. *Chemical reaction rates depend on factors that influence the frequency of collision of reactant molecules. As a basis for understanding this concept, students know:*

- the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time.*
- how reaction rates depend on such factors as concentration, temperature, and pressure.*
- the role a catalyst plays in increasing the reaction rate.*
- * the definition and role of activation energy in a chemical reaction*