

## the "clock reaction" kinetics lab

Name: \_\_\_\_\_

In this lab you will investigate ways to change how fast a reaction occurs. First, you will change the concentrations of the reactants. Second, you will change the temperature of the reactants.

Solution "A": is an acidified 0.0048 M NaHSO<sub>3</sub> solution with starch indicator.

Solution "B" is 0.012 M KIO<sub>3</sub> solution.

$$M_f = \frac{M \cdot V}{V_t}$$

### Part 1: Effect of concentration of solution "B"

Use 25 mL of "A". Use indicated mL of "B" diluted to 25 mL with water.

V <sub>A</sub>	[A]	V <sub>B</sub>	[B]	time (s)
25 mL	0.0048 M	25 mL	0.012 M	
25 mL	0.0048 M	20 mL		
25 mL	0.0048 M	15 mL		
25 mL	0.0048 M	10 mL		
25 mL	0.0048 M	5 mL		

### Part 2: Effect of concentration of solution "A"

Use 25 mL of "B". Use indicated mL of "A" diluted to 25 mL with water.

(just copy this time from Part 1)

V <sub>A</sub>	[A]	V <sub>B</sub>	[B]	time (s)
25 mL	0.0048 M	25 mL	0.012 M	
20 mL		25 mL	0.012 M	
15 mL		25 mL	0.012 M	
10 mL		25 mL	0.012 M	
5 mL		25 mL	0.012 M	

### Part 3: Effect of temperature

Use 25 mL of "A" and 25 mL of "B" at various temperatures.

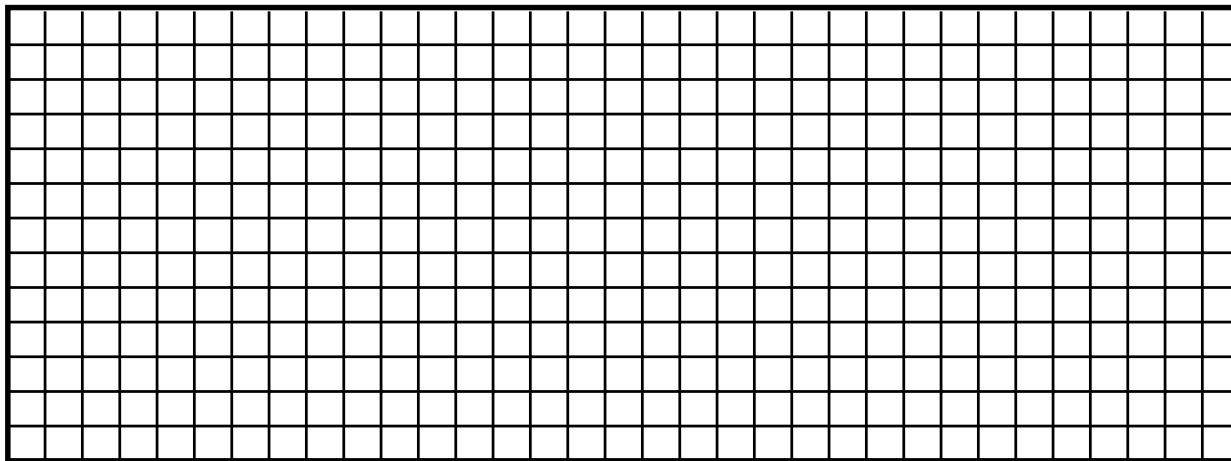
	temp °C	time (s)
cold		
hot		

### Part 4 Got the time?

Show Mr. A that you can get the reaction to occur in \_\_\_\_\_ seconds

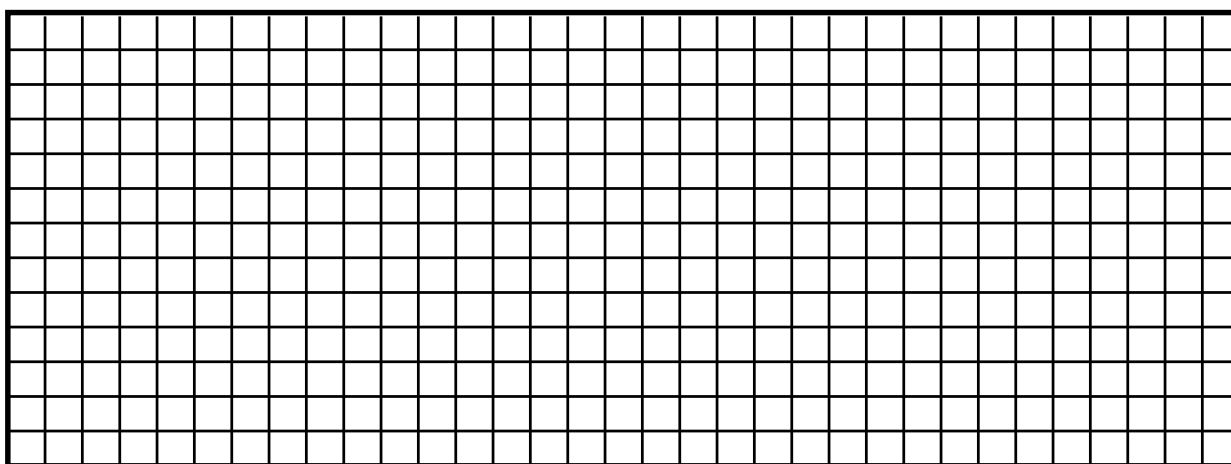
**Graph:** On the back, plot your data for part 1 & part 2, and create a molarity vs. time graph. Scale your axes to best fit your data. Once your data is plotted, try to connect your points with a smooth curve or a straight line (whichever seems more appropriate). Do not do a "dot-to-dot" graph.

[B] (mol/L)



time (sec)

[A] (mol/L)



time (sec)

**Questions:**

1. Which has a greater effect on reaction time: the  $[\text{NaHSO}_3]$  or the  $[\text{KIO}_3]$ ?
2. Explain why changing the molarity of the reactants effected the reaction rate, in terms of collision theory.
3. Explain why changing the temperature of the reactants had an effect on the reaction rate, in terms of collision theory.
4. Based on your graph (and on common sense), what would happen to **time** (sec) if the molarity was zero?