

Name \_\_\_\_\_  
Partner \_\_\_\_\_

Period \_\_\_\_\_  
Date \_\_\_\_\_

### The Iodine Clock Reaction

#### Prelab Questions

- 1) Why is it important to use two separate graduated cylinders in this lab?
- 2) Why is it important to rinse the glassware for these reactions with distilled water?

#### Procedure

- 1) Put on your safety goggles and proper clothing. Obey all safety rules for this lab.
- 2) The two solutions for this experiment are A: 0.0094M  $\text{KIO}_3$ , B: 0.0038M  $\text{NaHSO}_3$  in starch.
- 3) Thoroughly wash all the glassware you use today with soap and water and then rinse it with distilled water. Contaminated glassware will ruin these reactions.
- 4) Prepare two graduated cylinders labeled A and B. Use these exclusively for the solutions they are labeled for and you will not have to wash them between reactions.
- 5) Label two beakers for stock solutions of A and B.
- 6) Label one beaker for running all of your reactions in. This needs to be washed between reactions and rinsed with distilled water.
- 7) Get the stock solutions from the stock bottles.  
Fill the graduated cylinders with the two liquids according to the chart below.
- 8) Pour solution B into your reaction beaker and set it on a white sheet of paper. Then add solutions A to the same beaker. Stir this exactly ten times. Start timing the reaction from the second the liquids meet until it changes color. Record this time in the data table.
- 9) Repeat for each of the eight reaction mixes.

#### Part I

Mixture	Solution A	Solution B
1	20.0 mL	20.0 mL
2	15.0 mL + 5.0 mL DI $\text{H}_2\text{O}$	20.0 mL
3	10.0 mL + 10.0 mL DI $\text{H}_2\text{O}$	20.0 mL
4	5.0 mL + 15.0 mL DI $\text{H}_2\text{O}$	20.0 mL

#### Part II

Mixture	Solution A	Solution B
5	20.0 mL	20.0 mL +4 drops $\text{CuSO}_4$
6	15.0 mL + 5.0 mL DI $\text{H}_2\text{O}$	20.0 mL +4 drops $\text{CuSO}_4$
7	10.0 mL + 10.0 mL DI $\text{H}_2\text{O}$	20.0 mL +4 drops $\text{CuSO}_4$
8	5.0 mL + 15.0 mL DI $\text{H}_2\text{O}$	20.0 mL +4 drops $\text{CuSO}_4$

### Data Tables

Mixture	Reaction Time (Seconds)
1	
2	
3	
4	
5	
6	
7	
8	

### Post Lab Questions

1) Using  $C_1V_1=C_2V_2$  calculate the concentrations, after dilution, of the solutions used.

Mixture	$\text{IO}_3^-$ Concentration	Reaction Time (Seconds)
1		
2		
3		
4		
5		
6		
7		
8		

2) Using the data from question 1 prepare and attach a graph to this paper. It is a graph of concentration of iodate ion versus reaction time. Use reactions 1, 2, 3, 4 for the graph.

3) Why should you graph only trials 1-4 and not 5-8?

4) Starch is used in this reaction as an indicator. What does it indicate the presence of?

5) What is a catalyst?

6) Why does increasing the concentration of a solution speed up a reaction?

7) How does a catalyst change a reaction rate? Explain with the aid of a diagram.