Name _____ Period _____
Partner _____ Date _____

The Iodine Clock Reaction

Prelab Questions

1) Why is it important to use three 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 three solutions for this experiment are A: 0.20M KI, B: 0.0050M $Na_2S_2O_3$ in starch, and C: 0.10M $(NH_4)_2S_2O_8$.

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 three graduated cylinders labeled A, B, and C. Use these exclusively for the solutions they are labeled for and you will not have to wash them between reactions. Follow the size chart on the board.

5) Label three beakers for stock solutions of A, B, and C.

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 according to the chart on the board. Fill the graduated cylinders with the three liquids according to the chart below.

8) Pour solution B into your reaction beaker and set it on a white sheet of paper. Then simultaneously add solutions A and C 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 eleven reaction mixes.

Part I

Mixture	Solution A	Solution B	Solution C
1	20.0 mL	10.0 mL	20.0 mL
2	15.0 mL + 5.0 mL DI H_2O	10.0 mL	20.0 mL
3	10.0 mL + 10.0 mL DI H_2O	10.0 mL	20.0 mL
4	5.0 mL + 15.0 mL DI H_2O	10.0 mL	20.0 mL
5	20.0 mL	10.0 mL	15.0 mL + 5.0 mL DI H_2O
6	20.0 mL	10.0 mL	10.0 mL + 10.0 mL DI H_2O
7	20.0 mL	10.0 mL	5.0 mL + 15.0 mL DI H_2O

Part II

Mixture	Solution A	Solution B	Solution C
8	20.0 mL	10.0 mL	20.0 mL +4 drops $CuSO_4$
9	15.0 mL + 5.0 mL DI H_2O	10.0 mL	20.0 mL +4 drops $CuSO_4$
10	10.0 mL + 10.0 mL DI H_2O	10.0 mL	20.0 mL +4 drops $CuSO_4$
11	5.0 mL + 15.0 mL DI H_2O	10.0 mL	20.0 mL +4 drops $CuSO_4$

Data Tables

Mixture	Reaction Time (Seconds)	Mixture	Reaction Time (Seconds)
1		7	
2		8	
3		9	
4		10	
5		11	
6			

Post Lab Questions

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

Mixture	I^- Concentration	$S_2O_8^{2-}$ Concentration	Reaction Time (Seconds)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			

2) Using the data from question 1 prepare and attach two graphs to this paper. One graph of concentration of I^- ion versus reaction time(use reactions 1, 2, 3, 4) and one of $S_2O_8^{2-}$ ion versus reaction time(use reactions 1, 5, 6, 7). Time should always be the x-axis.

3) Why should you graph only trials 1-4 for the first graph and 1, 5, 6, 7 for the second?

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.