

Iodine Clock Reaction (simplified/new)

Purpose

To demonstrate the relationship between a concentration and the rate of a chemical reaction.

Materials

potassium iodate solution (.2M, 175 mL)	400 mL beaker (3)
Starch Solution (2%, 190 mL)	10 mL graduated cylinder
Sodium metabisulfite (3.8g)	50 mL graduated cylinder
Deionized water	100 mL graduated cylinder
250 mL beaker (3)	

Procedure

Preparation – best to prepare the day before

1. Prepare 100 mL of a 0.2M sodium metabisulfite solution by dissolving 3.8g in 100 mL of deionized water.
2. Prepare a 2% starch solution by adding 20g starch to 100 mL of deionized water. Pour starch paste into 1L of boiling water while stirring. Allow solution to cool (4-5 hours).
3. Prepare a series of solutions called **Solution A** according to the following chart, using 400 mL beakers:

	Beaker 1A	Beaker 2A	Beaker 3A
KIO ₃ (0.2M)	50 mL	100 mL	25 mL
Deionized Water	150 mL	100 mL	175 mL

4. Prepare 3 identical **Solution B** solutions by mixing 10 mL of 0.2M sodium metabisulfite solution, 30 mL of the starch solution, and 40 mL of deionized water in 250 mL beakers.

Presentation

1. All at the same time:
 - a. Pour solution B into Solution 1A. Stir.
 - b. Pour solution B into Solution 2A. Stir.
 - c. Pour solution B into Solution 3A. Stir.
2. Observe the differences in time it takes each of the solutions to change color.

Additional Information

1. Mechanism for this reaction is not well understood.

Questions for the Students

1. Why is the amount of water changed in each trial?
2. Explain how concentration affects the rate at a molecular level.
3. What would happen if B varied instead of A?

Disposal

Solutions should be placed in a properly labeled waste container with UI# 202140.

Reference

Summerlin, L. and Ealy, J. Chemical Demonstrations: A Sourcebook for Teachers, 1985.