

Kinetics of Dye Fading

Data Table

Indicator	

	Final Temperature	
Absorbance*	Ln(Abs)*	1/Abs*
	Absorbance*	

^{*}Computer-generated tables and graphs may be substituted for the data table and Post-Lab Questions 1–3.

Post-Lab Questions (Use a separate sheet of paper to answer the following questions.)

- 1. Plot or obtain a graph of absorbance versus time. Does the "rate of fading" of the indicator depend on the concentration of the dye? Explain.
- 2. Calculate the values of ln(Abs) and 1/Abs for each absorbance measurement and enter the results in the table. *Note:* This may be done directly with the data saved in the technology program or separately using a calculator or spreadsheet program.
- 3. Plot or obtain graphs of both ln(Abs) versus time and of 1/Abs versus time. (See the *Background* section and the *Pre-Lab Questions*.)
- 4. Which graph more closely approximates a straight line?
- 5. Is the reaction of the indicator with hydroxide ions (Equation 2) first or second order in indicator?
- 6. Did the temperature of the solution change over the course of the reaction? What effect, if any, would the temperature change have on the results of the experiment?
- 7. The concentration of sodium hydroxide is assumed to be constant throughout the reaction and is thus included in the "reduced" rate law expression (see Equation 4 in the *Background* section). Is this assumption valid? Prove it.