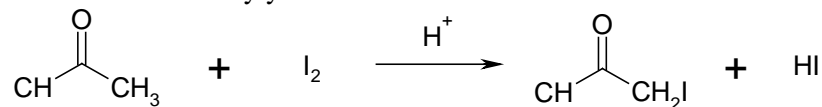


Sample Questions from the 2004 Chem111 Midterm I

- 1) Explain the concept of reaction order. What can you say about the reaction order for iodination of acetone in acidic solutions? Justify your answer. The balanced chemical reaction is shown below:



- 2) Explain how a continuous-flow rapid-kinetics experiment is performed. What are the potential applications of this method? What are its advantages and disadvantages compared to the stopped-flow rapid kinetics method?
- 3) UV-Vis spectrophotometry is a widely used method to monitor kinetics of reactions in the solution. Answer the following questions about this method:
- What structural features in molecules are responsible for UV absorbance?
 - Describe the working principle of a conventional (non-diode array) UV-Vis spectrophotometer. Show how the instrument obtains the absorbance value.
- 4) Give the relationship between the rate coefficient (rate constant) and the half-life in the irreversible first-order reaction. Hint: You may derive it easily from the rate law if you do not remember this result.