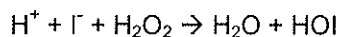
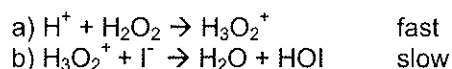


Reaction Mechanisms Assignment

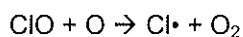
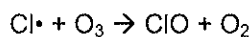
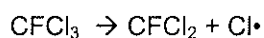
1. Hydrogen peroxide reacts with hydrogen ions and iodide ions according to the following equation:



The mechanism often suggested for this reaction is:

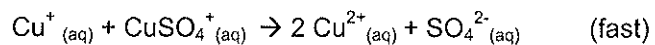
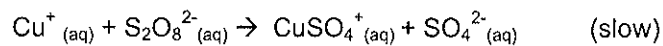
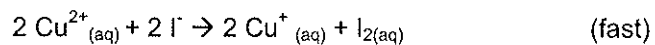


- a) Show that adding equations a) and b) gives the overall equation.
- b) How would you expect the rate to be affected if the concentration of I^- is doubled?
- c) How would you expect the rate to be affected if the concentration of H^+ is doubled?
- 2) A group of educators wish to have Jane Goodall give a lecture to a group of teachers on the behaviour of chimpanzees. One of the educators knows Jane personally and goes to an adjacent office to telephone Jane's agent in New York. The agent calls to send a telegram via satellite to Africa. The telegram is typed and put into an envelope. The envelope is given to a messenger who must travel a few hundred kilometers by boat and a few hundred kilometers on foot before handing the message to Jane Goodall. The messenger returns to the telegraph office with the reply and the process is reversed. Which is the rate determining step?
- 3) The following equations represent the proposed mechanism by which chlorine-containing fluorocarbons could destroy ozone, O_3 , in the atmosphere.



- a) Explain why chlorine atoms are said to catalyze ozone decomposition.
- b) If the chlorine atoms catalyze ozone decomposition, will the amount of Cl presently in the atmosphere ever be used up?

- 4) Consider the reaction of $\text{S}_2\text{O}_8^{2-}$ ions with I^- ions, for which a suggested mechanism has been determined by supporting empirical evidence, as shown. Assume that the overall reaction is slightly exothermic.



- Identify the catalyst and the intermediate products in this reaction.
- Identify the reactants and products, and write the overall reaction equation.
- Sketch a potential energy vs reaction progress graph for this reaction.
- Explain what effect increasing the concentration of I^- ions would have on the overall rate.
- Explain what effect increasing the concentration of $\text{S}_2\text{O}_8^{2-}$ ions would have.