

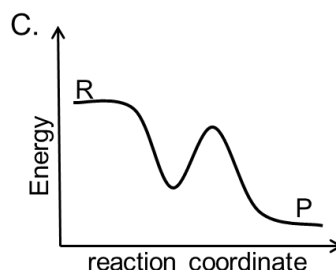
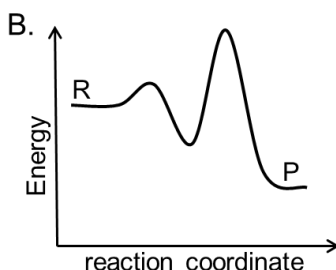
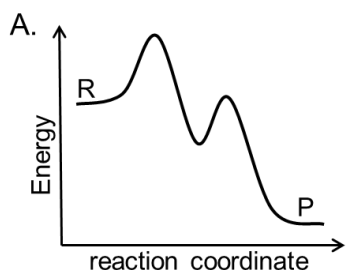
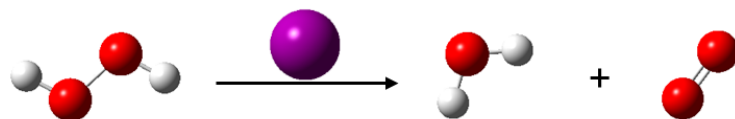
## Chapter 20 Worksheet 4

Name:

### Instructions:

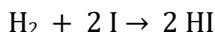
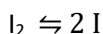
- Please enter your first and last name as it appears on the eLC roster (do not use a nickname).
- Your UGA myID is a combination of letters and numbers (example: mine is sre13137). **Do not use your 81x number.**
- If you have a printer, print the worksheet, write your answers on the template showing your work where appropriate, convert it to a PDF and Upload this worksheet to Gradescope by 11:59 p.m. on Thursday, September 10. **You do not need to upload anything to eLC.**
- If you do not have a printer, type your answers in the boxes and write your work on separate sheets of paper and convert your work to a PD. Upload the PDF of your work to eLC: go to Tools, Assignments, then "Chapter 20 Worksheet1". Then upload the worksheet template to Gradescope by 11:59 p.m. on Monday, September 14.

1. The exothermic iodide catalyzed decomposition of peroxide was determined to occur via two separate steps in which the first step is the rate determining step. Which of the following three potential energy diagrams best summarizes these findings.



2. A schematic of the potential energy diagram for the reaction of iodine with hydrogen is shown to the right. Based on this diagram, which of the following statements is incorrect.

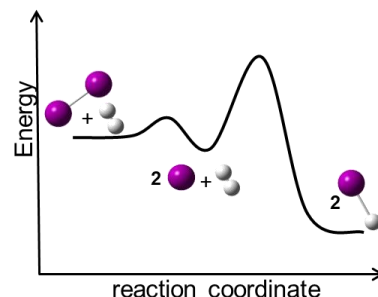
A. The mechanism for the reaction could be



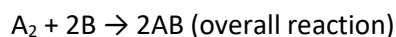
B. Since iodine atoms are intermediate species, their concentration is undetectable during the course of the reaction.

C. The second step is the rate-determining step.

D. The overall reaction is exothermic.



3. Given the following proposed mechanism, predict the rate law for the overall reaction.



Mechanism




A. Rate =  $k[A][B]$

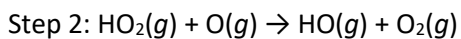
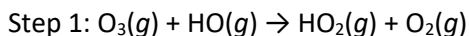
B. Rate =  $k[A_2][B]$

C. Rate =  $k[A_2][B]^{1/2}$

D. Rate =  $k[A_2]$

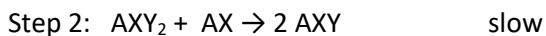
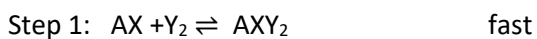
E. Rate =  $k[A_2]^{1/2}[B]$

4. A mechanism for a naturally occurring reaction that destroys ozone is:



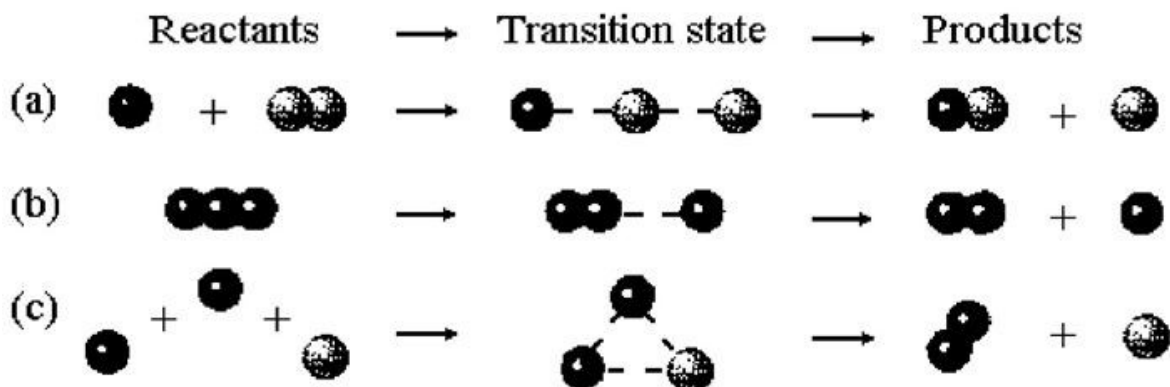
Which species is a catalyst?

5. A gaseous reaction occurs by a two-step mechanism, shown below.



What is the rate law for this reaction?

6. Which of the elementary reactions shown has a molecularity of one?



7. A reaction occurs via the following sequence of elementary steps. What is the rate law based on this reaction mechanism?

1st step:  $A \rightleftharpoons B$       very fast

2nd step:  $B + C \rightarrow D$       slow

3rd step:  $D \rightarrow 2E$       fast