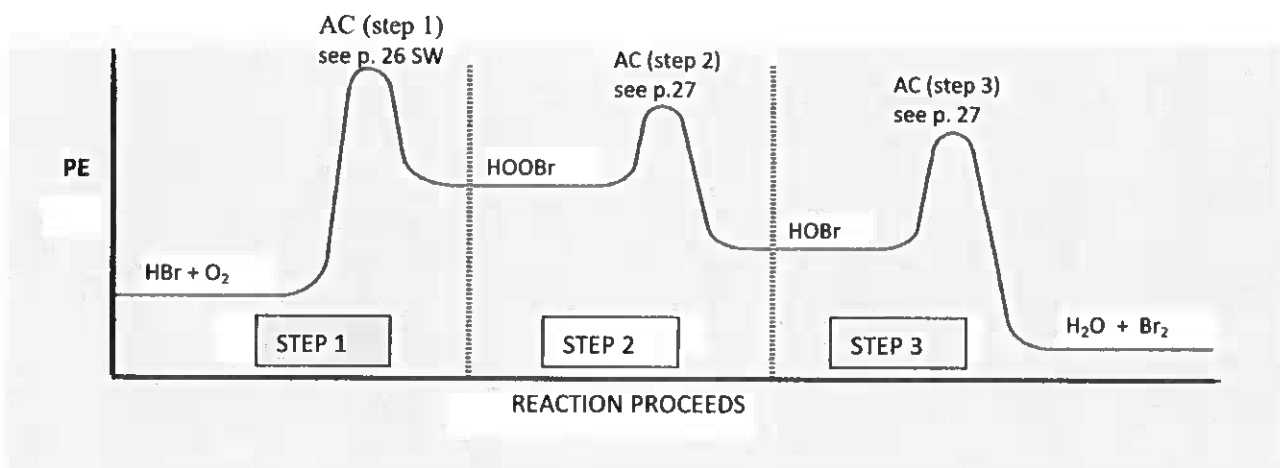


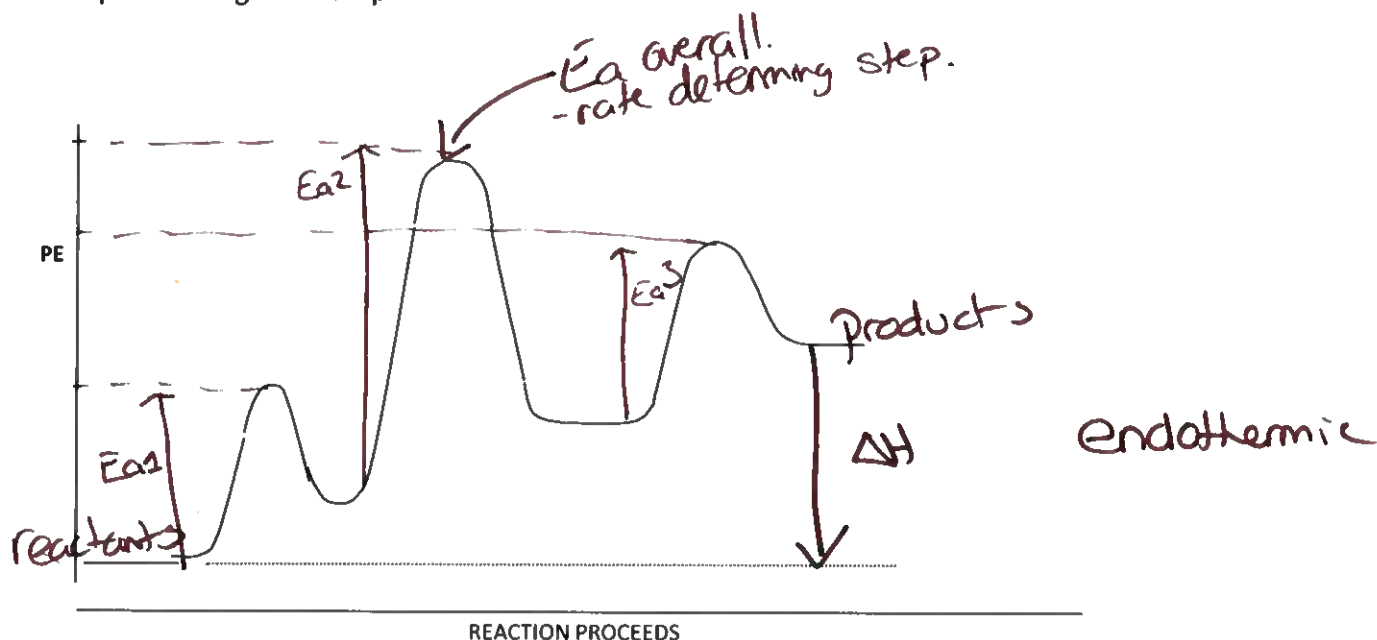
Name: Key

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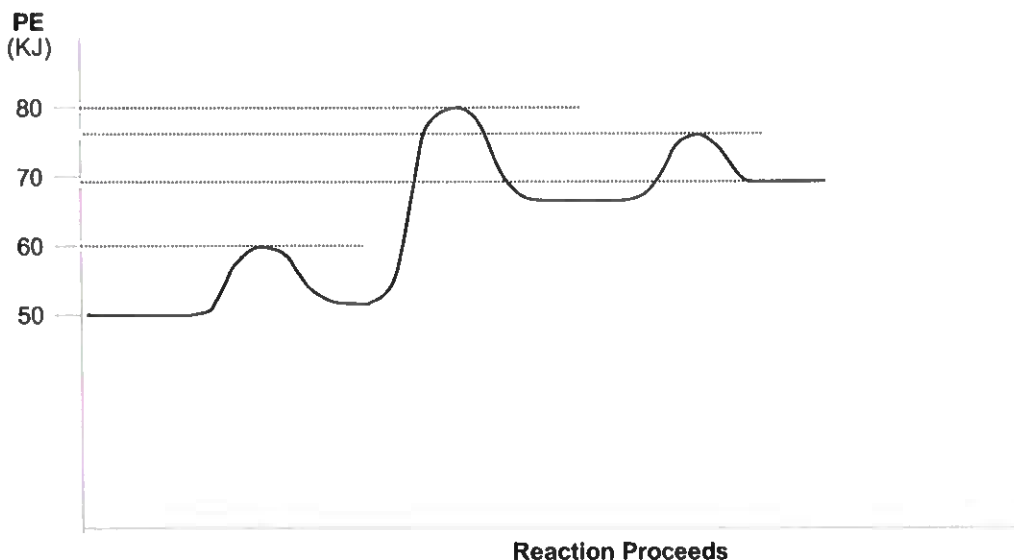
### Chemistry 12: Lesson 8 – Potential Energy Diagrams for Reaction Mechanisms



- Each "bump" represents the Activation energy ~~Activated Complex~~ of a different step in the reaction mechanism
- The higher the  $E_a$  the Slower the step
- The highest  $E_a$  will be for the rate determining step step
- The top of each  $E_a$  represents the Activated Complex
- intermediates are in the middle "valleys"
- products are in the final "valley"
- The  $E_a$  for the forward overall reaction is the vertical distance from reactants to the top of the highest bump

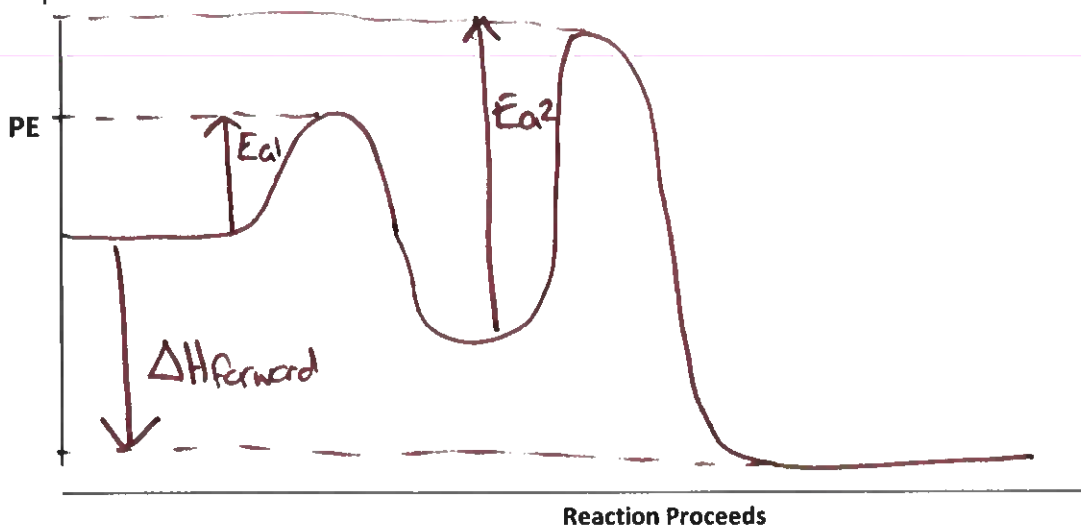


Question: Given the following Potential Energy Diagram for a reaction mechanism:



1. This mechanism has 3 steps
2.  $E_a$  for the forwards rxn = 30 kJ
3. Step 2 is the RDS
4. Step 3 is the fastest step.
5. The overall rxn. is endo thermic
6.  $\Delta H = \sim 19$  kJ
7.  $\Delta H$  for reverse rxn. =  $\sim -19$  kJ
8. RDS for reverse rxn. is step 2

Draw a Potential Energy Diagram for a reaction mechanism with 2 steps. The first step is fast and the second step is slow. The overall reaction is exothermic. Label the  $\Delta H$  for the forward reaction and the  $E_a$  for each step.



Read p. 29-30 in SW.

Do Ex. 54 and 55 on page 30 of SW.