

Advanced Placement Chemistry
PowerPoint worksheet
"A molecular View"

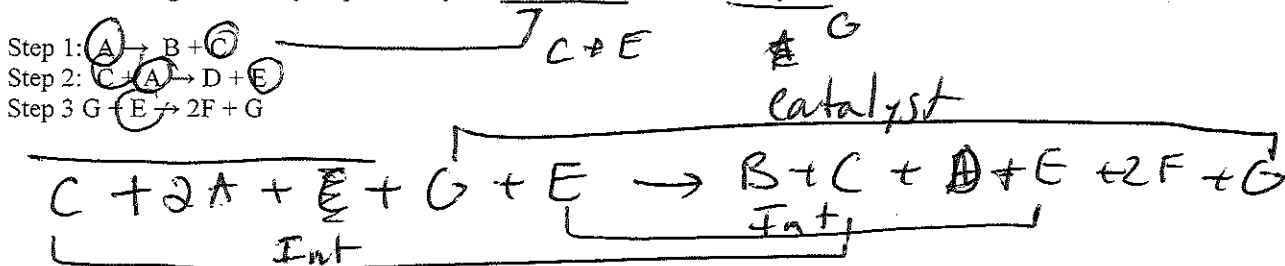
1. What is the only 100% sure way to determine the orders of a reaction?

- Run a reaction in Lab timing it out. tracking some aspect of the process.

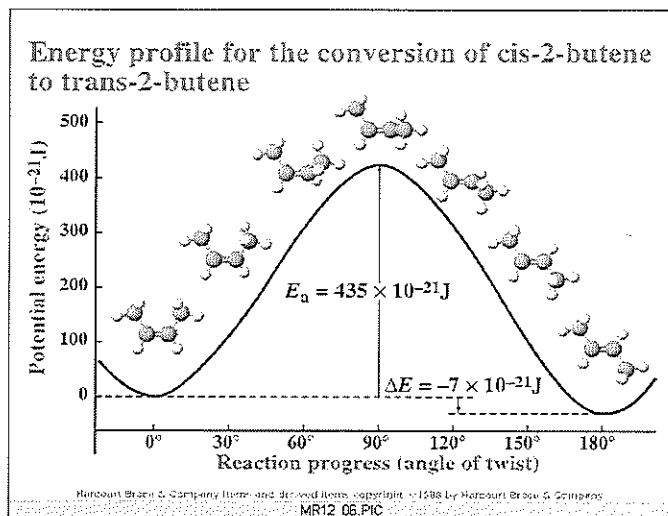
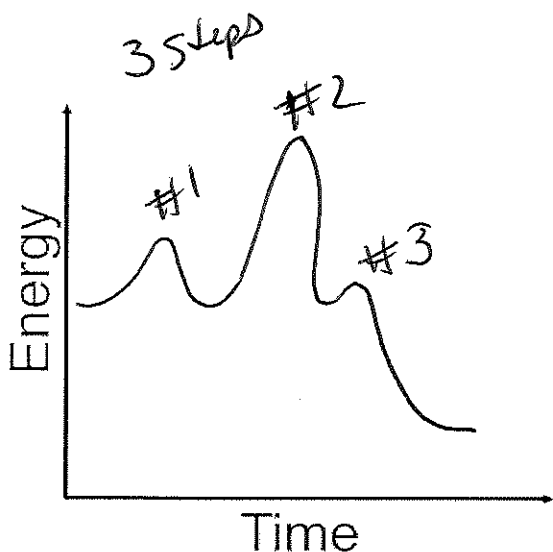
2. Elementary steps are:

Hypothetical individual steps showing how stuff reacts.

3. In the following elementary steps identify the intermediate and the catalyst.



2. Draw an energy diagram for the previous elementary reactions. Where the overall reaction is exothermic and the activation energy increases: #2 > #1 > #3



4. Is the following energy diagram to the upper right?

- Exothermic/endothermic?
- Unimolecular, Bimolecular, termolecular?
- What is the order of this reaction?

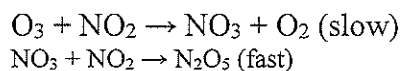
1st order

5. Activation energy is defined as the amount of energy needed to start a reaction. There are two ways speed up a reaction relative to the activation energy. What are they?

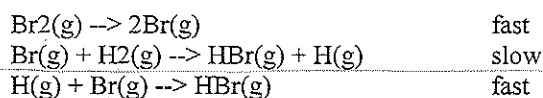
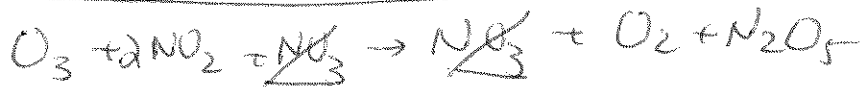
1) Raise the temperature
2) add a catalyst



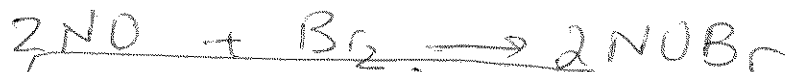
4. For each of the following sets of reaction mechanisms, determine the form of the integrated rate law.



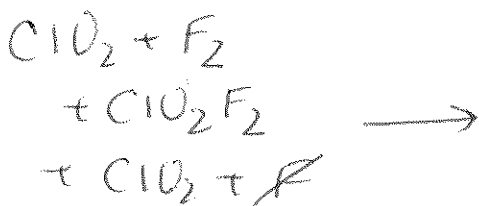
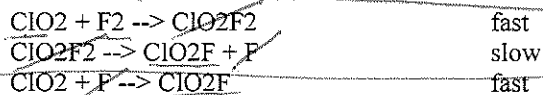
$$\text{Rate} = k [\text{O}_3] [\text{NO}_2]$$



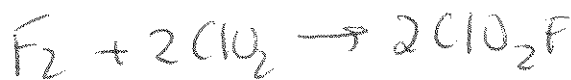
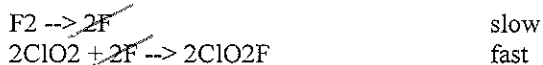
$$\text{Rate} = k [\text{Br}_2]^1 [\text{H}_2]^1$$



$$\text{Rate} = k [\text{NO}]^2 [\text{Br}_2]$$



$$\text{Rate} = k [\text{ClO}_2]^2 [\text{F}_2]^1$$



$$\text{Rate} = k [\text{F}_2]^1 [\text{ClO}_2]^0$$