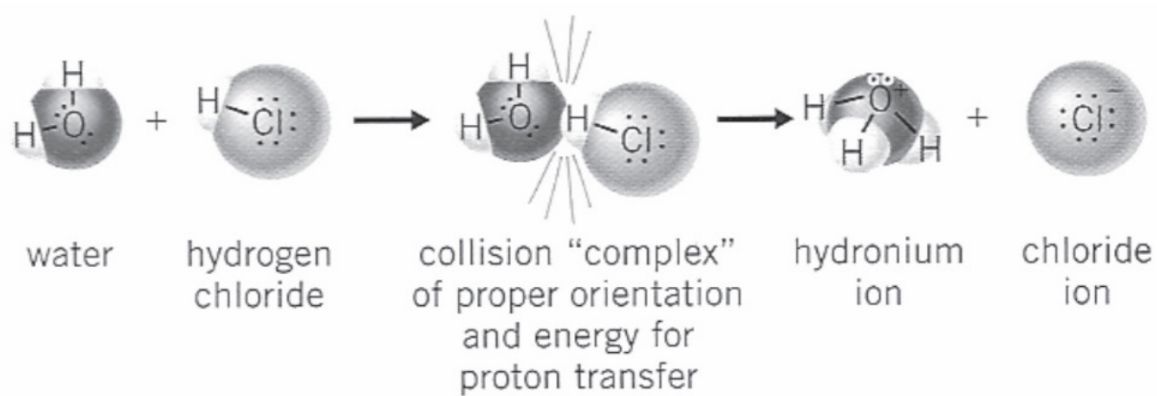


Lesson Overview

Collision Theory

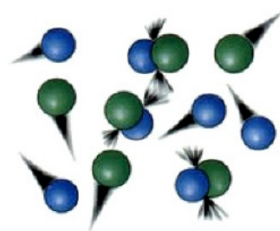
Objective: The student will be able to describe the two factors which determine the reality of a reaction and its relationship to potential energy.

Collision State Theory

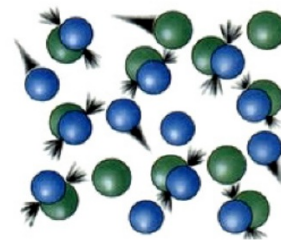


How do chemicals react?

Collision Theory

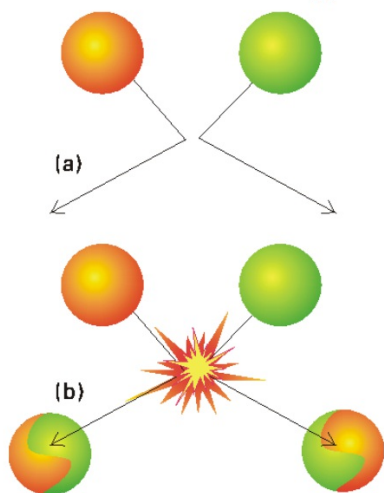


Low concentration = Few collisions



High concentration = More collisions

Molecules collide with one another causing bonds to break allowing for new products.



Criteria that must be met:

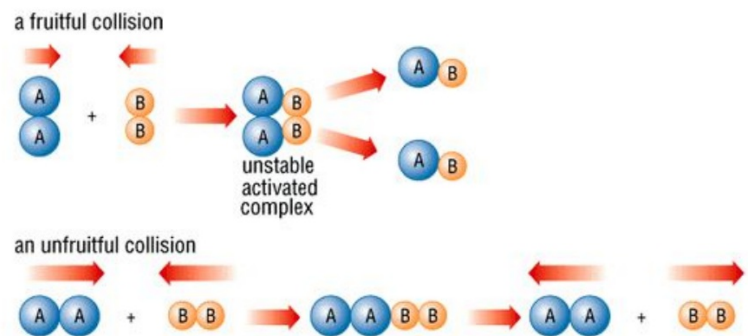
1. Collisions must have enough energy to activate the reaction.

2. Must collide in the correct and appropriate orientation.

Rates of Reactions

The following affect the rate of the reaction by speeding the reaction up:

1. Increased concentration of solvent
2. Increase collisions (stirring, shaking, adding heat)
3. Increase surface area (crush the substance)



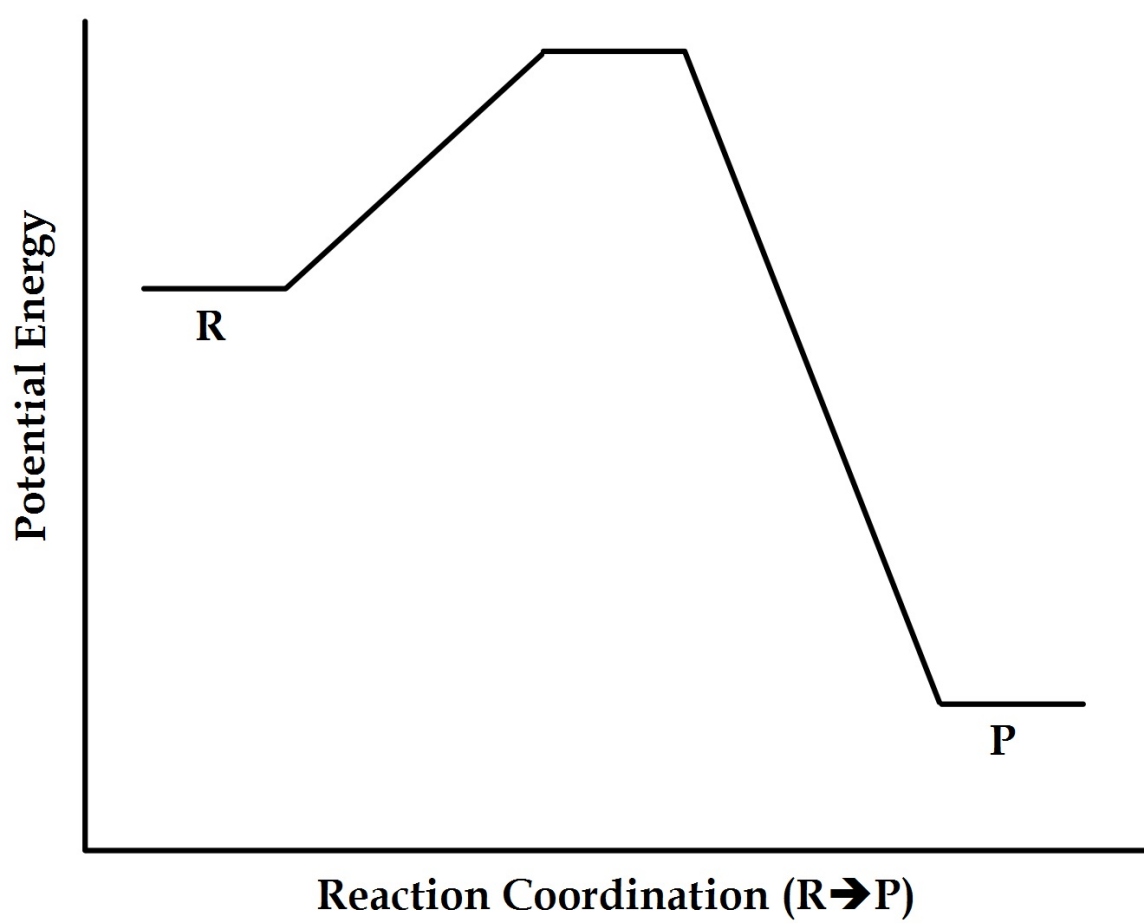
Potential Energy Diagrams

A **potential energy diagram** plots the changes in potential energy during a chemical reaction.

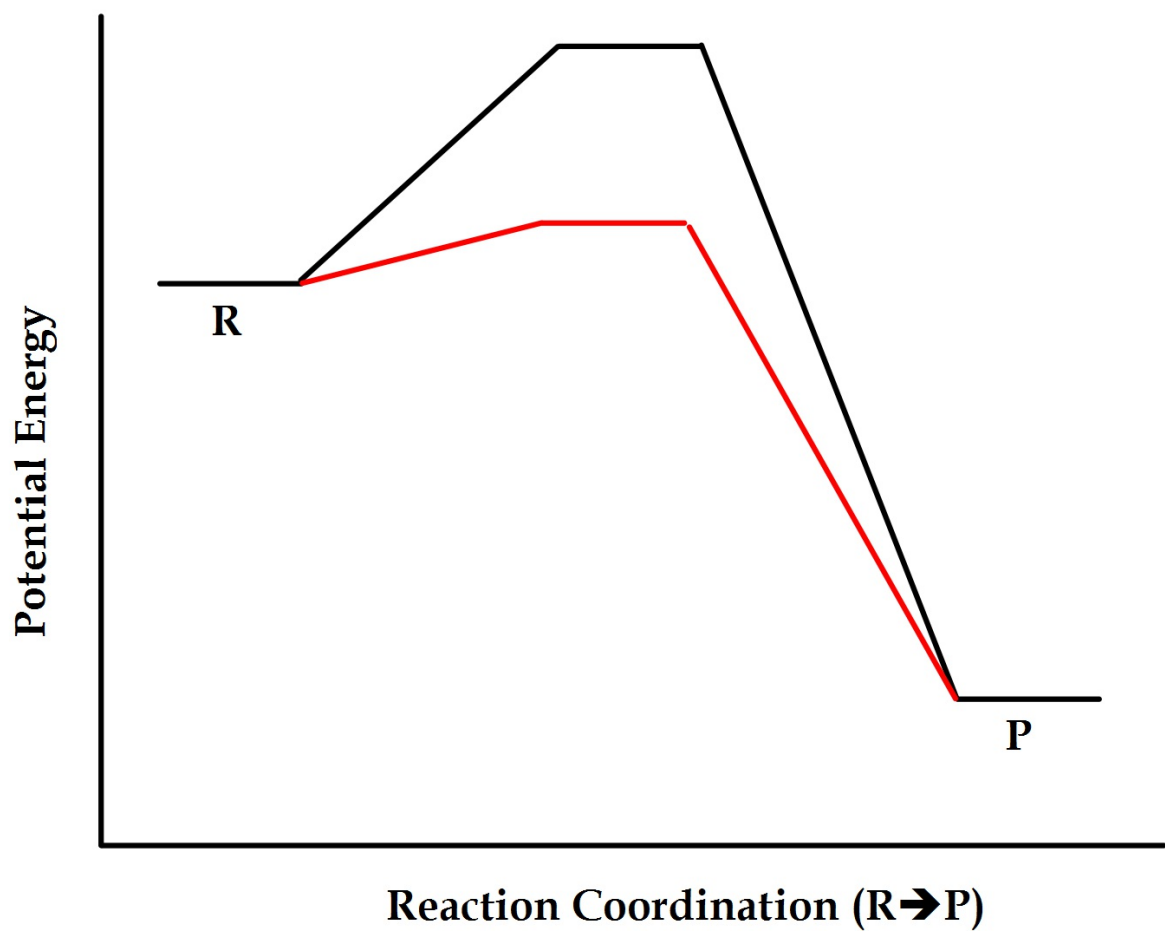
The following vocabulary list is comprised of essential words for understanding potential energy diagrams:

- (1) potential energy
- (2) activated complex
- (3) energy of reactants, products, and activated complex
- (4) enthalpy - ΔH
- (5) activation energy
- (6) catalyzed reaction
- (7) uncatalyzed reaction
- (8) endothermic and exothermic

PE Diagram for an uncatalyzed reaction



PE Diagram for a catalyzed reaction



PE Diagrams Conclusions

The relationship between potential energy and kinetic energy.

Essential Questions:

- (1) How do catalysts increase the rate of a chemical reaction?**
- (2) What purpose do PE diagrams serve? How will we determine values numerically?**