Inspiring Greatness
ISD
INDEPENDENCE SCHOOL DISTRICT

High School Science Virtual Learning

College Chemistry
Kinetics Equilibria Virtual Lab

May 14, 2020

High School College Chemistry
Lesson: May 14, 2020

Objective/Learning Target:
Students will complete lab activities to learn about kinetics.

Let's Get Started:

1. What is the definition for rate of reaction?

2. What is activation energy?

Let's Get Started:

Answer Key

1. Rate of reaction is the rate of change in concentration over time

2. Activation energy is the minimum amount of energy that particles must have in order to react

Lesson Activity:

Directions

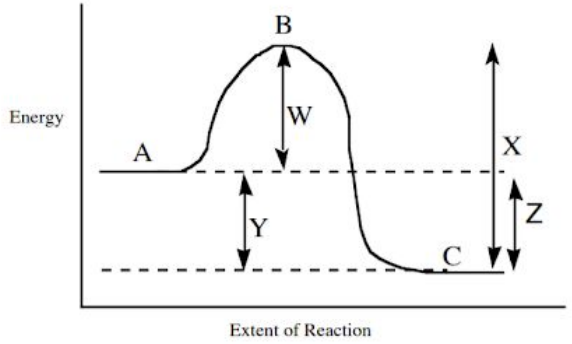
- Use this answer key to check your work from yesterday.
- This link is from Khan Academy will help expand your knowledge of kinetics.

Practice

Complete the following questions using the information you learned during the lesson activity.

Questions:

1. For the reaction diagram shown, which of the following statements is true?



a. Line W represents the ΔH for the forward reaction; point B represents the transition state
b. Line W represents the activation energy for the forward reaction; point B represents the transition state
c. Line Y represents the activation energy for the forward reaction; point C represents the transition state
d. Line X represents the ΔH for the forward reaction; point B represents the transition state

Questions:

2. A proposed mechanism for the reduction of nitrogen as NO by hydrogen is:

Step 1: $H_2(g) + 2NO(g) \rightarrow N_2O(g) + H_2O(g)$ (slow)

Step 2: $N_2O(g) + H_2(g) \rightarrow N_2(g) + H_2O(g)$ (fast)

What is the rate law?

a. Rate = $k[H_2][NO]$
b. Rate = $k[H_2]^2[NO]$
c. Rate = $k[H_2][NO]^2$
d. Rate = $k[H_2]^2[NO]^2$
e. More information is needed to answer this question.

Questions:

3. The mechanism for the reaction $2H_2O_2(aq) \rightarrow 2H_2O(l) + O_2(g)$ in the presence of $I^-(aq)$ is proposed to be:

Step 1: $H_2O_2(aq) + I^-(aq) \rightarrow H_2O() + OI^-(aq)$ (slow)

Step 2: $H_2O_2(aq) + OI^-(aq) \rightarrow H_2O() + O_2(g) + I^-(aq)$ (fast)

What is the rate law for the overall reaction?

a. Rate = $k[H_2O_2]$
b. Rate = $k[H_2O_2]^2$
c. Rate = $k[H_2O_2][I^-]$
d. Rate = $k[H_2O_2][OI^-]$
e. Rate = $k[H_2O_2]^2[I^-]/[H_2O]$

Answer Key:

1. B
2. C
3. C

Additional Practice:
Click on the link below for additional practice.
Collision Theory Quiz

Kinetics Quiz