Kinetics: Second-Order Kinetics

1. Consider the data collected for the reaction

$$A \rightarrow \text{products}$$

[A], M	Time, s
3.50	0
2.42	5
1.69	12
1.26	20
1.15	23

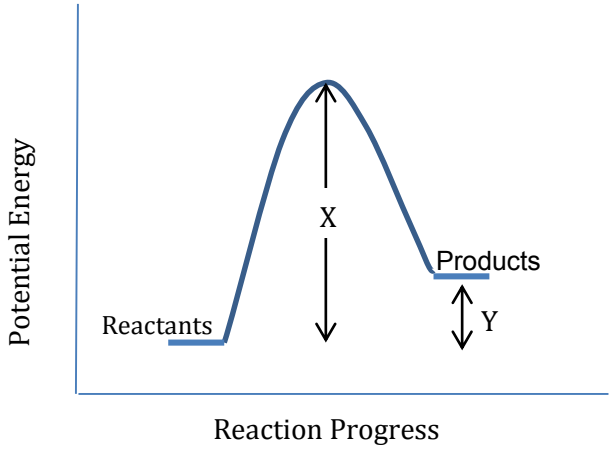
Determine the order of the reaction.

2. A second-order reaction has a rate constant of $2.50 \times 10^{-3}\ M^{-1}s^{-1}$. The reaction starts with a concentration of reactant of 1.25 M. What is the concentration of the reactant after 40 seconds?

Kinetics: Collision Theory

1. Which one of the following statements is ***false*** concerning collision theory of chemical kinetics?
    a. Molecules collide in order to react. As the concentration increases, the number of collisions per second increases, therefore the rate of reaction increases.
    b. Every collision between the correct molecules will result in a reaction.
    c. As temperature increases, the reaction rate increases. This is because more molecules have enough kinetic energy to overcome the activation energy barrier.
    d. In comparing two first-order reactions with different activation energies but the same initial concentrations, the reaction with the greater activation energy will have a slower rate of reaction.

2. Consider the following diagram and select the true statement.



a. The variable X represents activation energy and can be positive or negative, depending upon the reaction.
b. The variable Y represents activation energy and can be positive or negative, depending upon the reaction.
c. The variable X represents activation energy and is always a positive value.

The variable Y represents activation energy and is positive only for endothermic reactions.