

## Rate and Reactions Session 2

Transition State	Half-Life	True
Activation Energy	Slope	False

1. half-life

1. The amount of time it takes for  $\frac{1}{2}$  of a reactant to be used up in a chemical reaction

2. False

2. Temperature will affect the reactants concentration in a reaction

3. Slope

3. Your rate constant is also the \_\_\_\_\_ of a graph

4. transition state

4. The organization of atoms at the highest energy state

5. true

5. The rate constant doubles (approx.) with every 10 degree Celsius rise

6. activation energy

6. The minimum energy required for a reaction to take place

1. Write the second order integrated rate law:

$$\frac{1}{[A]} = \frac{1}{[A]_0} + kt$$

2. Write the first order integrated rate law:

$$\ln[A] = -kt + \ln[A]_0$$

3. The reaction  $2A \rightarrow B$  has a rate constant of  $2.8 \times 10^{-2} \text{ s}^{-1}$ . How long will it take for A to decrease from 0.96 M to 0.18 M?

$$\ln[A]_t - \ln[A]_0 = -kt$$

$$\ln(0.18\text{M}) - \ln(0.96\text{M}) = -2.8 \times 10^{-2} \text{ s}^{-1} \cdot t$$

$$-1.67398 = -2.8 \times 10^{-2} \text{ s}^{-1} \cdot t$$

$$t = 59.78$$

$$t = 60 \text{ sec}$$

units for  
first  
order