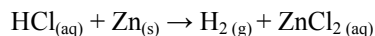


Practice Questions Section 4.3

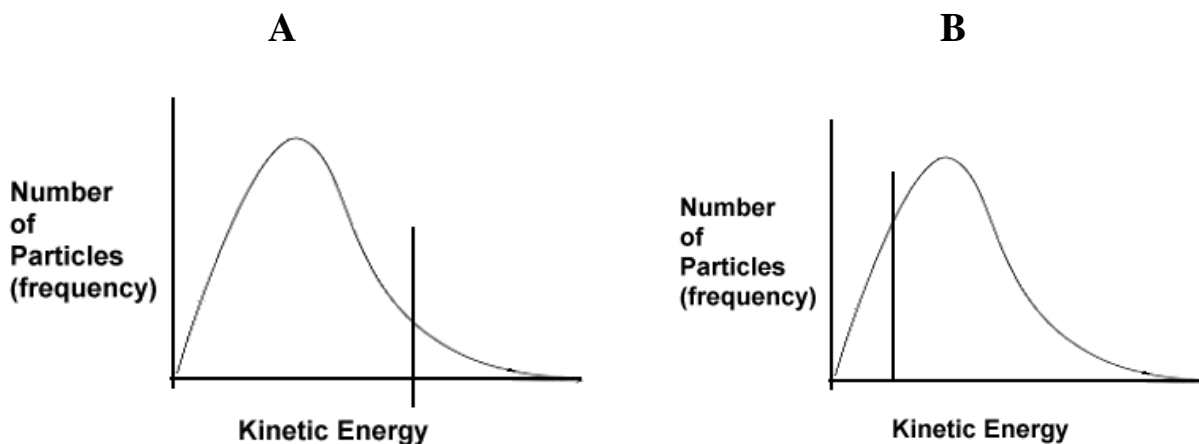
Factors Influencing Reaction Rate – Concentration & Pressure

1. Consider the following reaction that occurs between hydrochloric acid, HCl, and zinc metal:



Will this reaction occur fastest using a 6 M solution of HCl or a 0.5 M solution of HCl? Explain.

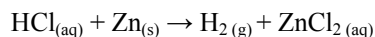
2. Again consider the reaction between hydrochloric acid and zinc. How will increasing the temperature affect the rate of the reaction? Explain.
3. Based on the following kinetic energy curves, which reaction will have a faster rate - A or B? Explain. Also, which reaction, A or B, would benefit most in terms of increased rate if the temperature of the system were increased?



Practice Questions Section 4.3

Factors Influencing Reaction Rate – Concentration & Pressure **Answers**

1. Consider the following reaction that occurs between hydrochloric acid, HCl, and zinc metal:



Will this reaction occur fastest using a 6 M solution of HCl or a 0.5 M solution of HCl? Explain.

Solution:

The reaction will occur fastest with 6 M HCl, because it is more concentrated than the 0.5 M solution. In the more concentrated solution there are more moles of HCl present - with a higher concentration of reacting particles, collisions will occur more frequently, leading to a faster rate of reaction.

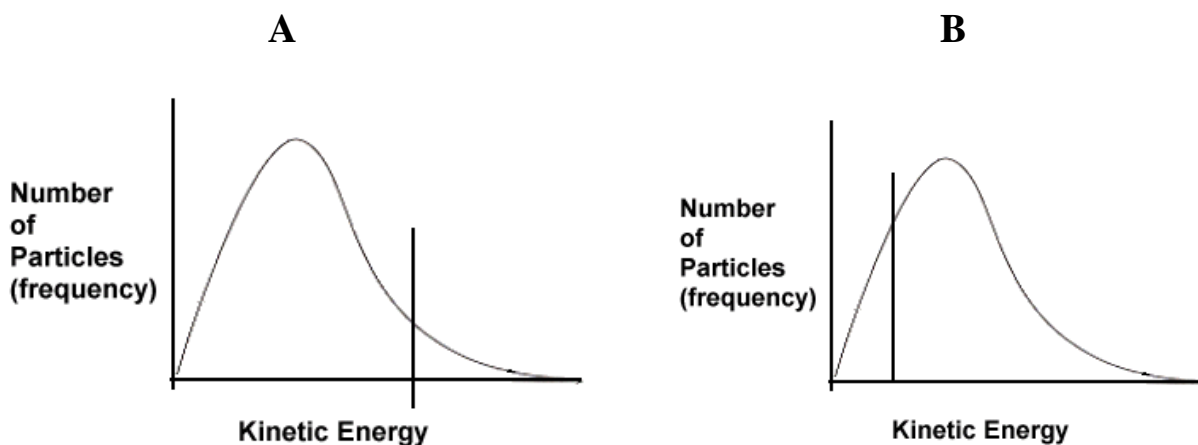
2. Again consider the reaction between hydrochloric acid and zinc. How will increasing the temperature affect the rate of the reaction? Explain.

Solution:

Increasing the temperature will most likely increase the rate of the reaction, for **two reasons**:

- Particles will move around faster at the higher temperature and thus will collide more frequently, resulting in a faster rate of reaction.
- Particles will collide with more force. Thus, more particles will likely have sufficient energy (E_a) to reach the activated complex and thus have a successful collision.

3. Based on the following kinetic energy curves, which reaction will have a faster rate - A or B? Explain. Also, which reaction, A or B, would benefit most in terms of increased rate if the temperature of the system were increased?

**Solution:**

Reaction B would be faster than Reaction A because it has a lower threshold energy (activation energy). Thus, more particles have at least the minimum amount of energy required for a successful reaction.

Reaction A would benefit most by an increase in temperature. Reaction B already have the majority of particles above the threshold energy; having more particles above the threshold would not make a significant difference in the rate.