

Directions: Choose the letter that corresponds to the correct answer.

For numbers 1-5, consider the equilibrium reaction below.



- Which of the following is TRUE?
 - The forward reaction is exothermic.
 - The forward reaction is endothermic.
 - The forward reaction is both endothermic and exothermic.
 - More information is needed
- What will happen to the reaction if the system undergoes compression?
 - Nothing will happen to the system as it is unaffected by changes in pressure.
 - The reaction will shift towards the formation of PCl_5 until a new equilibrium position is reached.
 - The reaction will shift towards the formation of PCl_3 and Cl_2 until a new equilibrium position is reached.
 - The endothermic reaction will be favored over the exothermic reaction until a new equilibrium position is reached.
- Which of the following is the most appropriate K_{eq} expression for the reaction above?
 - $K_{eq} = \frac{[\text{PCl}_3][\text{Cl}_2]}{[\text{PCl}_5]}$
 - $K_{eq} = \frac{[\text{PCl}_5]}{[\text{PCl}_3][\text{Cl}_2]}$
 - $K_{eq} = \frac{P_{\text{PCl}_3} P_{\text{Cl}_2}}{P_{\text{PCl}_5}}$
 - $K_{eq} = \frac{P_{\text{PCl}_5}}{P_{\text{PCl}_3} P_{\text{Cl}_2}}$

4. Lowering the temperature will favor the formation of what species?
 - a. Cl_2
 - b. PCl_3
 - c. PCl_5
 - d. PCl_3 and Cl_2

5. Which of the following situations will force the equilibrium reaction to go to completion?
 - a. removal of Cl_2 gas the moment it was formed
 - b. maintaining the temperature between 10-15 °C using a cold water bath
 - c. constant addition of PCl_5
 - d. constant addition of PCl_3 and Cl_2