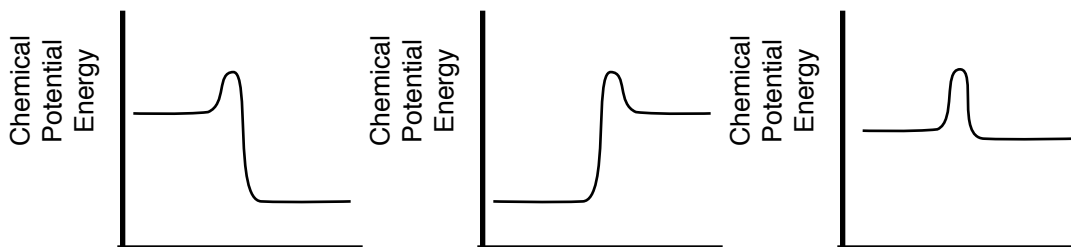


## Chemical Equilibrium

Name \_\_\_\_\_

1) Describe in words what is happening at the atomic level when a chemical reaction is in equilibrium. All of the concentrations of the reactants and products appear to be staying constant, but equilibrium is a dynamic process, so explain what is happening when some chemical reaction is in equilibrium.

2) Which of the following graphs shows a reaction that mostly goes from left to right. Explain why you made that choice.



3) Draw a potential energy curve that will show a reaction that will form an equilibrium where there are almost equal products and reactants, but slightly more reactants. Explain why that is the right graph.

4) If you had the following reaction:  $2 \text{NO}_2 \rightleftharpoons \text{N}_2\text{O}_4$

Which of the following has an effect on the final equilibrium:

- a) The initial concentration of  $\text{NO}_2$
- b) The initial concentration of  $\text{N}_2\text{O}_4$
- c) The rate of the reaction going left to right  $2 \text{NO}_2 \longrightarrow \text{N}_2\text{O}_4$
- d) The rate of the reaction going right to left  $2 \text{NO}_2 \longleftarrow \text{N}_2\text{O}_4$
- e) Both c and d

5) If you started with only  $\text{NO}_2$ , draw a graph of the concentration of both  $\text{NO}_2$  and  $\text{N}_2\text{O}_4$  as they come to equilibrium. Assume the reaction left to right ( $2 \text{NO}_2 \longrightarrow \text{N}_2\text{O}_4$ ) is slight faster than right to left ( $2 \text{NO}_2 \longleftarrow \text{N}_2\text{O}_4$ ).