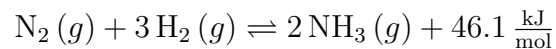


Name: \_\_\_\_\_

Block: \_\_\_\_\_

### Le Châtelier's Principle

Consider the chemical equation:



1. Indicate which direction the equilibrium would shift as a result of each of the following:

(a) Adding  $\text{N}_2$

(b) Removing  $\text{NH}_3$

(c) Removing  $\text{H}_2$

(d) Decreasing the temperature

(e) Increasing the pressure

2. Write the equilibrium expression for the above reaction.

3. The value of  $K_{eq}$  for this reaction is  $5.34 \times 10^6$  at  $25^\circ\text{C}$ . If the reaction is at equilibrium at  $25^\circ\text{C}$ , the concentration of  $\text{H}_2$  is  $0.050\text{ M}$  and the concentration of  $\text{N}_2$  is  $0.025\text{ M}$ , what is the concentration of  $\text{NH}_3$ ?
4. If the concentration of  $\text{H}_2$  is decreased to  $0.040\text{ M}$ , and the concentration of  $\text{N}_2$  and the temperature remain unchanged, what is the new equilibrium concentration of  $\text{NH}_3$ ? Is this consistent with the prediction made by Le Châtelier's Principle in question #1c above?