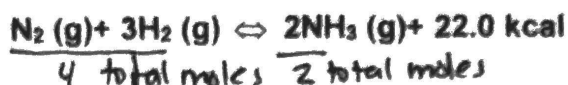


## LeChatelier's Principle

Use the following reaction to answer the questions:



1. Which way will the reaction shift if (use arrows):

- a.) add  $\text{N}_2$   $\longrightarrow$
- b.) add  $\text{H}_2$   $\longrightarrow$
- c.) add  $\text{NH}_3$   $\longleftarrow$
- d.) remove  $\text{N}_2$   $\longleftarrow$
- e.) remove  $\text{H}_2$   $\longleftarrow$
- f.) remove  $\text{NH}_3$   $\longrightarrow$
- g.) increase temperature (exo)  $\longleftarrow$
- h.) decrease temperature  $\longrightarrow$
- i.) increase volume  $\longleftarrow$
- same  $\left\{ \begin{array}{l} \text{j.) decrease volume } \longrightarrow \\ \text{k.) increase pressure } \longrightarrow \end{array} \right. \text{ (less moles)}$
- l.) decrease pressure  $\longleftarrow$

2. Write a  $K_{\text{eq}}$  expression for the reaction:

$$K_{\text{eq}} = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$$

3. Determine the  $K_{\text{eq}}$  if the concentration of  $\text{N}_2$  is 0.580 M,  $\text{H}_2$  is 0.900 M, and  $\text{NH}_3$  is 0.785 M.

$$K_{\text{eq}} = \frac{[.785 \text{ M}]^2}{[.580 \text{ M}][.900 \text{ M}]^3} = 1.46$$

4. Would this reaction favor the reactants or the products?

products because  $K_{\text{eq}} > 1$