

Fill in the blanks and provide short answers.

1. What is equal in a state of equilibrium? _____

2. Circle your answer from the choices within parenthesis:
When equilibrium is reached, the concentration of reactants (increases, decreases, remains the same) and the concentration of products (increases, decreases, remains the same) .
3. What does the value (the number) of K_{eq} tell you? _____

4. a. Write a balanced equation for the synthesis of ammonia (NH_3) from nitrogen and hydrogen, including the term "energy" as if it is a product of the reaction

b. Write the K_{eq} expression for the reaction above.
5. For the reaction, $2SO_3 \rightleftharpoons 2SO_2 + O_2$, $[SO_3] = 0.37M$, $[SO_2]=0.25M$, $[O_2] = 0.86M$. Write the K_{eq} equation, calculate K_{eq} , and explain what this value means.
6. For the equilibrium system $PCl_5 \rightleftharpoons PCl_3 + Cl_2$, $K_{eq} = 35$. If the concentrations of PCl_5 and PCl_3 are 0.025M and 0.68M respectively, what is the concentration of the Cl_2 ?