1. Indicate if the following matches $K = 1$, $K > 1$ or $K < 1$:

a. reaction favors the products

b. equilibrium lies on the left

c. there are equal amounts of reactants and products at equilibrium

d. weak electrolyte dissociation

e. reaction goes to completion

2. The following reaction is at equilibrium: $2\text{NO}_2(g) + \text{Cl}_2(g) \rightarrow 2\text{NOCl}_2(g)$ $K_p = 50.8$

If the partial pressures are 0.095 atm NO, 0.171 atm Cl$_2$, calculate partial pressure of NOCl.

3. The equilibrium constant for the reaction $2\text{NO} (g) + \text{Br}_2(g) \rightarrow 2\text{NOBr}(g)$ is $K = 1.3 \times 10^{-2}$.

Calculate the value of $K$ for:

a. $2\text{NOBr} \rightarrow 2\text{NO} + \text{Br}_2$

b. $\text{NO} + \frac{1}{2} \text{Br}_2 \rightarrow \text{NOBr}$

c. $4\text{NOBr} \rightarrow 4\text{NO} + 2\text{Br}_2$
4. Given the following equilibrium constants,

\[
\text{NaO (g)} \rightarrow \text{Na(l)} + \frac{1}{2} \text{O}_2 (g) \quad K_1 = 2 \times 10^{-5}
\]
\[
\text{Na}_2\text{O}_2 (s) \rightarrow 2\text{Na(l)} + \text{O}_2 (g) \quad K_2 = 5 \times 10^{-29}
\]

Determine the value of the equilibrium constant for the reaction \( \text{Na}_2\text{O}_2 (s) \rightarrow 2\text{NaO (g)} \)

5. At a certain temperature, 10.0 mol of SO\(_3\) is placed into a 5.0 L container and the SO\(_3\) dissociates by the reaction: \( 2\text{SO}_3 (g) \rightarrow 2\text{SO}_2 (g) + \text{O}_2 (g) \). At equilibrium, 4.0 mol of SO\(_2\) is present. Calculate \( K \) for this reaction.