1. Sulfur trioxide is placed in a reaction container, heated to 130 °C, and allowed to reach a state of equilibrium:

\[
\text{SO}_3(g) \rightleftharpoons \text{SO}_2(g) + \text{O}_2(g)
\]

The equilibrium concentrations are as follows: \([\text{SO}_2] = 0.026 \text{ M}, [\text{O}_2] = 0.013 \text{ M}, \) and \([\text{SO}_3] = 0.12 \text{ M} \).

(a) Write the equilibrium constant expression for this reaction. (Do not forget to balance the chemical equation).

\[
K = \frac{[\text{SO}_2]^2 [\text{O}_2]}{[\text{SO}_3]^2}
\]

(b) Calculate the value of the equilibrium constant at 130°C. (Must show work for credit)

\[
K = \frac{[0.026 \text{ M}]^2 [0.013 \text{ M}]}{[0.12 \text{ M}]^2} = \frac{0.000676 \text{ M}^2 [0.013 \text{ M}]}{0.0144 \text{ M}^2} = 6.1 \times 10^{-4} \text{ M}
\]

(c) Describe the position of the equilibrium (in favor of reactants or products).

favor of reactants