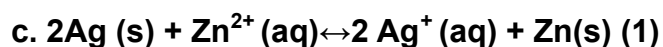
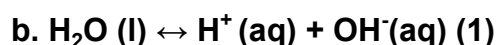


1.. Write the expression for K_c for the following reactions. In each case indicate whether the reaction is homogeneous or heterogeneous.



2. Consider the following reaction: $\text{Cl}_2(\text{g}) + \text{I}_2(\text{g}) \leftrightarrow 2\text{ICl}(\text{g})$ $K_p = 81.9$ at 25°C . A reaction mixture initially at 25°C initially contains $P_{\text{I}_2} = 0.100 \text{ atm}$, $P_{\text{Cl}_2} = 0.100 \text{ atm}$, $P_{\text{ICl}} = 0.100 \text{ atm}$. Find the equilibrium partial pressures of I_2 , Cl_2 , and ICl at this temperature.

3. Consider the following reaction: $\text{NiO}(\text{s}) + \text{CO}(\text{g}) \leftrightarrow \text{Ni}(\text{s}) + \text{CO}_2(\text{g})$ $K_c = 4.0 \times 10^3$ at 1500 K . If a mixture of solid nickel(II) oxide and 0.20 M carbon monoxide is allowed to come to equilibrium at 1500 K , what will be the equilibrium concentration of CO_2 ?

4. Consider the reaction: $\text{CO (g)} + 2\text{H}_2\text{(g)} \leftrightarrow \text{CH}_3\text{OH (g)}$

A reaction mixture at 780°C initially contains $[\text{CO}] = 0.500\text{ M}$ and $[\text{H}_2] = 1.00\text{ M}$. At equilibrium, the CO concentration is found to be 0.150 M . What is the value of the equilibrium constant?

5. Consider the chemical equation and equilibrium constant for the synthesis of NH_3 at 25°C : $\text{N}_2\text{(g)} + 3\text{H}_2\text{(g)} \leftrightarrow 2\text{NH}_3\text{(g)}$ $K_{c1} = 3.7 \times 10^8$

Calculate the equilibrium constant for the following reaction

at 25°C : $\text{NH}_3\text{(g)} \leftrightarrow \frac{1}{2}\text{N}_2\text{(g)} + \frac{3}{2}\text{H}_2\text{(g)}$