Sistla 18 Chemical equilibrium
Chemistry 2

Name:
02/09/2025

1. For the reaction:

$CO\,(g) + Cl_2\,(g) \rightleftharpoons COCl_2\,(g)$

At a certain temperature, Kc=2.0. The initial concentrations are:

- [CO]=0.50 M
- $[Cl_2]$=0.50 M
- $[COCl_2]$=0.20 M

What is the reaction quotient (Qc) and will the reaction proceed forward or backward?

(A) Qc=1.6, the reaction proceeds forward
(B) Qc=0.8, reaction proceeds forward
(C) Qc=0.8, reaction proceeds in reverse
(D) Qc=1.6, the reaction proceeds in reverse
(E) Qc=2.0, the system is at equilibrium

2. $2NO_2(g) \rightleftharpoons N_2O_4\,(g)$

At equilibrium, the concentrations are given as:

- $[NO_2]$=0.10M
- $[N_2O_4]$=0.15M

Calculate the equilibrium constant Kc for the reaction.

3. **Calculating Q and Comparing to Kc**

Reaction:

$CO(g)+Cl_2(g) \rightleftharpoons COCl_2(g)$

Equilibrium constant, Kc=5.0

Initial concentrations: [CO]=0.20M; $[Cl_2]$=0.20M; $[COCl_2]$=0.10M

- Calculate the reaction quotient Q.
- Determine whether the reaction will shift to the right (toward products) or to the left (toward reactants) to reach equilibrium.

SAT questions