PRACTICE: EQUILIBRIUM CALCULATIONS 4

Use simplifying assumptions to solve the following problems.

1. Phosgene gas reversibly decomposes to carbon monoxide gas and chlorine gas according to the equation below. If the initial concentration of phosgene in a sealed vessel is 1.5 mol/L then what is the equilibrium concentration of chlorine gas at 100°C?

$$COCl_2(g) \rightleftharpoons CO(g) + Cl_2(g) \qquad K_{100^\circ C} = 2.2\times10^{-8}$$

2. At high temperature, nitrogen gas and oxygen gas can react to produce nitrogen monoxide gas according to the equation below. A closed 5.0-L vessel initially contains 0.52 mol of nitrogen gas and 0.14 mol of oxygen gas. Find the concentration of nitrogen monoxide at equilibrium when the mixture is heated to 1500 K?

$$N_2(g) + O_2(g) \rightleftharpoons 2\,NO(g) \qquad K_{1500\ K} = 1.0\times10^{-5}$$