Equilibrium Written Response:

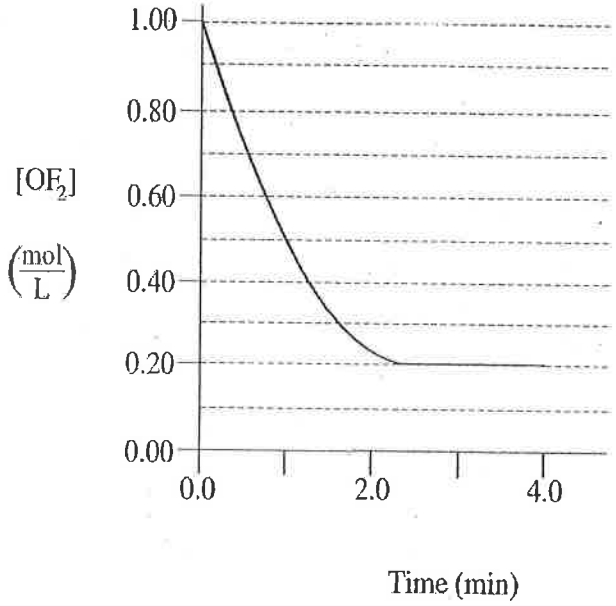
1.

(4 marks)

Consider the following equilibrium:

$$O_2(g) + 2F_2(g) \rightleftarrows 2OF_2(g)$$

Initially, some OF_2 was placed in a 1.0 L container and allowed to react. The amount of OF_2 was monitored over 4 minutes and the following graph was produced:



Calculate the value of K_{eq}.

2.

Consider the equilibrium: $CO_2(g) + H_2(g) \rightleftarrows CO(g) + H_2O(g)$ $K_{eq} = 1.60$

Initially, 8.2 mol of CO and 8.2 mol of H_2O are placed in a 2.0 L container and allowed to react. Calculate the equilibrium concentrations of CO_2 and CO. (4 marks)

3.

Consider the following equilibrium:

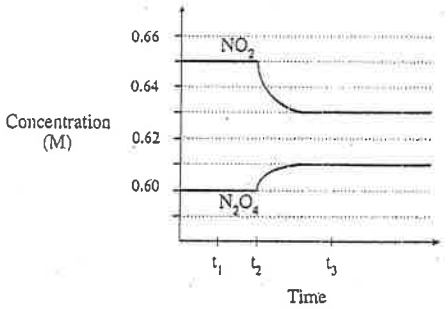
$$N_{2(g)} + O_{2(g)} \rightleftarrows 2NO_{(g)} \qquad K_{eq} = 8.1 \times 10^{-3}$$

A 2.0 L container is filled with 0.15 mol N_2, 0.15 mol O_2 and 0.050 mol NO. Does the [NO] increase or decrease as equilibrium is established? Support your answer with appropriate calculations. (4 marks)

4.

Consider the following diagram for the equilibrium:

$$N_2O_{4(g)} \rightleftarrows 2NO_{2(g)} \qquad \Delta H = +59\,kJ$$



a) Calculate the value of K_{eq} at t_1. (1 mark)

b) Calculate the value of K_{eq} at t_3. (1 mark)

c) What stress was applied at time t_2 ? Explain. (2 marks)

Stress: _____

Explanation: _____