LECTURE 18

1. Phosgene ($COCl_2$) is a chemical warfare agent that decomposes by the reaction:

$$COCl_2(g) \rightleftharpoons CO(g) + Cl_2(g) \qquad K = 8.3 \times 10^{-4} \text{ (at 360°C)}$$

Calculate the [CO], [Cl_2], and [$COCl_2$] when 10.0 mol of phosgene decompose at 360°C and reach equilibrium in a 5.00-L flask.

2. For the reaction in question 1, predict whether the reaction will shift toward products or reactants when the following stress to the system is applied.

(a) $COCl_2$ *(g)* is added.
(b) Cl_2 *(g)* is added.

3. The decomposition of nitrosyl bromide (NOBr) proceeds by the following reaction:

$$2NOBr\ (g) \rightleftharpoons 2NO\ (s) + Br_2\ (g) \qquad K = 0.0142$$

Calculate the [NOBr], [NO], and [Br_2] when 10.0 mol of nitrosyl bromine is placed in a 5.00-L closed vessel and allowed to decompose.

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