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AP Chemistry – Practice and Review – 51

Name _____Per ___

1. Write the equilibrium-constant expression and calculate the value of the equilibrium constant at 298 K for the reaction $2SO_{2(g)} + O_{2(g)} \leftrightarrow 2SO_{3(g)}$

2. For the equilibrium $2IBr_{(g)} \leftrightarrow I_{2(g)} + Br_{2(g)}$ $K_{eq} = 8.5 \times 10^{-3}$ at $150^{\circ C}$. If 0.025 moles of IBr is placed in a 2.0 L container, what is the partial pressure of this substance after equilibrium is reached?

3. Acetonitrile, CH_3CN is a polar organic solvent that dissolves a wide range of solutes, including many salts. The density of a 1.80 M acetonitrile solution of LiBr is 0.826 g/mL. Calculate the concentration of the solution in (a) molality

(b) mole fraction of LiBr

(c) mass percentage of CH_3CN

4. What are the concentrations of H^+, $H_2PO_4^-$, HPO_4^{2-}, and PO_4^{3-} in a 0.0250 M solution of H_3PO_4 where $K_{a1} = 7.5 \times 10^{-3}$, $K_{a2} = 6.2 \times 10^{-8}$, $K_{a3} = 4.2 \times 10^{-13}$?

5. Determine the empirical formula of the compound with 55.3% K, 14.6% P and 30.1% O.