CHM 111
Take-Home Quiz   **Name:** _____
Due next class period

Answer each question. If a calculation is required, show your work.

1,2)   For the equilibrium $SO_2Cl_2(g) \leftrightarrow SO_2(g) + Cl_2(g)$ with K = 0.045, if you start with a reaction vessel containing 0.0555 $\underline{M}$ SO_2Cl_2, what will the concentrations of SO_2 and Cl_2 be at equilibrium?

- $[SO_2]$ =   _____ $\underline{M}$
- $[Cl_2]$ = _____ $\underline{M}$

3) For the equilibrium $HC_3H_5O_2(aq) \leftrightarrow H^+(aq) + C_3H_5O_2^-(aq)$ where K = 1.3×10^{-5}, calculate the equilibrium concentration of H^+ if you were to dissolve 0.13 moles $HC_3H_5O_2$ in 500.0 mL of water.

- $[H^+]$ at equilibrium is _____ $\underline{M}$

4) In an equilibrium between oxides of nitrogen, $N_2O_3(g) \leftrightarrow NO_2(g) + NO(g)$, with K = 0.193. If a reaction vessel contains 0.250 $\underline{M}$ N_2O_3, 0.225 $\underline{M}$ NO, and 0.147 $\underline{M}$ NO_2, will the reaction proceed to the left or right, or is the reaction already at equlibrium?

- The reaction _____ *(proceeds to the left, proceeds to the right, is already at equilibrium)*

5) Write the concentration-based equilibrium constant expressions for the following:

A) $Fe^{3+}(aq) + SCN^-(aq) \leftrightarrow Fe(SCN)^{2+}(aq)$; K =

B) $Cu(NO_3)_2(aq) + Zn(s) \leftrightarrow Cu(s) + Zn(NO_3)_2(aq)$; K =

C) $H_3PO_4(aq) \leftrightarrow 3H^+(aq) + PO_4^{3-}(aq)$; K =

D) $2H_2(g) + O_2(g) \leftrightarrow 2H_2O(g)$; K=