Dougherty Valley HS Chemistry - AP
Equilibrium – Extra Practice Keq Constant

Worksheet #2*

Name: **Period:** **Seat#:**

Directions: Any worksheet that is labeled with an * means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website…and the entire internet! See me if you need help finding practice on a topic you are struggling with.

Directions: Write the equilibrium expression for each equation, and then calculate the value of the equilibrium constant. In each case, the concentrations listed are in the order of compounds in the equation.

1) $N_2O_4 \leftrightarrow 2\ NO_2$
Equilibrium Concentrations: 0.014 M, 0.072 M (at 520 °C) *0.371*

2) $N_2 + 3\ H_2 \leftrightarrow 2\ NH_3$
Equilibrium Concentrations: 0.200 M, 0.200 M, 0.0160 M (at 583 °C) *0.16*

3) $SO_2 + ½\ O_2 \leftrightarrow SO_3$
Equilibrium Concentrations: 0.0200 M, 1.00 M, 0.400 M (at 500 °C) *20*

4) $PCl_3 + Cl_2 \leftrightarrow PCl_5$
Equilibrium Concentrations: 1.00 M, 0.900 M, 0.120 M (at room temperature) *0.133*

5) $2\ NH_3 \leftrightarrow N_2 + 3\ H_2$
Equilibrium Concentrations: 0.102 M, 1.03 M, 1.62 M (at 1000 K) *4.21×10^{2}*

6) $H_2 + I_2 \leftrightarrow 2\ HI$ (at room temperature)
Equilibrium Concentrations: 0.0500 mol, 0.0500 mol, 0.387 mol in 500.0 mL *59.9*

7) $2\ NO + O_2 \leftrightarrow 2\ NO_2$ (at 500 K)
Equilibrium Concentrations: 3.49×10^{-4} M, 0.800 M, 0.250 M *6.41×10^{5}*

8) $PCl_5 \leftrightarrow PCl_3 + Cl_2$ (at 500 K)
Equilibrium Concentrations: 0.861 M, 0.139 M, 0.139 M *2.24×10^{-2}*

9) $CO_2 + H_2 \leftrightarrow CO + H_2O$ (at 900 °C)
Equilibrium Concentrations: 0.648 M, 0.148 M, 0.352 M, 0.352 M *1.29*

10) $N_2O_4 \leftrightarrow 2\ NO_2$ (at 520 °C)
Equilibrium Concentrations: 0.0350 mol and 0.180 mol per 2.50 liter *0.370*

11) $Fe^{3+} + SCN^{-} \leftrightarrow FeSCN^{2+}$ (at room temperature)
Equilibrium Concentrations: $2.225E^{-4}$ mol, $2.225E^{-4}$ mol, $0.275E^{-4}$ mol in 250.0 mL *1.39×10^{2}*

12) The reaction $H_2 + I_2 \leftrightarrow 2\ HI$ has been studied under a variety of concentration conditions. The data is below:

Exp.	$[H_2]$	$[I_2]$	[HI]
1	0.00560	0.000590	0.0127
2	0.00460	0.000970	0.0147
3	0.00380	0.00150	0.0169
4	0.00170	0.00170	0.0118
5	0.00140	0.00140	0.0100
6	0.00420	0.00420	0.0294

Calculate the equilibrium constant (averaged) for this reaction *49.25*