WKS
Le Châtelier's Principle

Name_____
Period _____Date_____

Questions taken from textbook pgs. 568 & 586

1) Name three ways that the chemical equilibrium can be disturbed.

2) Predict the effect that decreasing the pressure (increasing volume) would have on each of the following reaction systems at equilibrium:

a) $H_2\,(g) + Cl_2\,(g) \rightleftharpoons 2\,HCl\,(g)$

b) $NH_4Cl\,(s) \rightleftharpoons NH_3\,(g) + HCl\,(g)$

c) $2\,H_2O_2\,(aq) \rightleftharpoons 2\,H_2O\,(l) + O_2\,(g)$

d) $3\,O_2\,(g) \rightleftharpoons 2\,O_3\,(g)$

3) When solid carbon reacts with oxygen gas to form carbon dioxide, 393.51 kJ of heat are released. Does this reaction become more or less favorable as the temperature decreases? Explain.

4) Predict whether each of the following stresses to the indicated reaction in equilibrium will favor the forward or reverse reaction. How will $[N_2O_5]$ and K_{eq} be affected?

$4\,NO_2\,(g) + O_2\,(g) \rightleftharpoons 2\,N_2O_5\,(g) + 113\ kJ$

a) addition of O_2

b) removal of N_2O_5

c) increased pressure

d) decreased temperature

e) removal of NO_2

f) decreased pressure

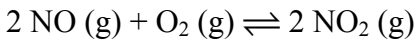
g) addition of a catalyst

h) increased temperature

i) decreased system volume

[over]

5) For the following reaction, would an increase or a decrease in pressure favor the forward reaction?



$$2\ NO\ (g) + O_2\ (g) \rightleftharpoons 2\ NO_2\ (g)$$

6) Explain the effect of a catalyst on an equilibrium system.

7) What relative pressure (high or low) would result in production of the maximum level of CO_2 according to the following? Explain.

$$2\ CO\ (g) + O_2\ (g) \rightleftharpoons 2\ CO_2\ (g)$$