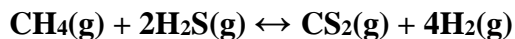# Le Châtelier's Principle Worksheet

1) **What would happen to the position of the equilibrium when the following changes are made to the equilibrium system below?**

$CH_4(g) + 2H_2S(g) \leftrightarrow CS_2(g) + 4H_2(g)$

(a) **Decrease the concentration of dihydrogen sulfide (hydrosulfuric acid).**

Equilibrium will shift to favor reactants.

(b) **Increase the pressure on the system.**

Equilibrium will shift to favor reactants.

(c) **Increase the temperature of the system.**

Not possible to answer as we do not know if the reaction is exo- or endothermic.

(d) **Increase the concentration of carbon disulfide.**

Equilibrium will shift to favor reactants.

(e) **Decrease the concentration of methane.**

Equilibrium will shift to favor reactants.

2) **What would happen to the position of the equilibrium when the following changes are made to the equilibrium system below?**

$2SO_3(g) \leftrightarrow 2SO_2(g) + O_2(g)$

(a) **Sulfur dioxide is added to the system.**

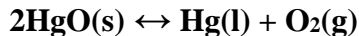**Equilibrium will shift to favor reactants.**

(b) **Sulfur trioxide is removed from the system.**

Equilibrium will shift to favor reactants.

(c) **Oxygen is added to the system.**

Equilibrium will shift to favor reactants.

3) **What would happen to the position of the equilibrium when the following changes are made to the reaction below?**
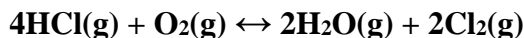
$2HgO(s) \leftrightarrow Hg(l) + O_2(g)$

(a) **HgO is added to the system.**

Equilibrium will shift to favor products.

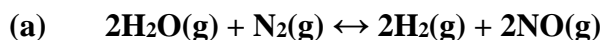(b) **The pressure on the system increases.**

Equilibrium will shift to favor reactants.

4) **When the volume of the following mixture of gases is increased, what will be the effect on the equilibrium position?**
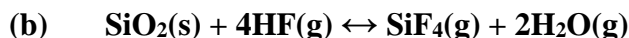
$4HCl(g) + O_2(g) \leftrightarrow 2H_2O(g) + 2Cl_2(g)$

Equilibrium will shift to favor reactants.

5) **Predict the effect of <u>decreasing the volume</u> of the container for each equilibrium.**

(a) $2H_2O(g) + N_2(g) \leftrightarrow 2H_2(g) + 2NO(g)$

Equilibrium will shift to favor reactants.

(b) $SiO_2(s) + 4HF(g) \leftrightarrow SiF_4(g) + 2H_2O(g)$

Equilibrium will shift to favor products.

(c) $CO(g) + H_2(g) \leftrightarrow C(s) + H_2O(g)$
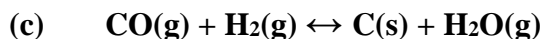
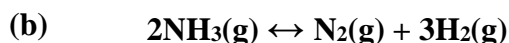**Equilibrium will shift to favor products.**

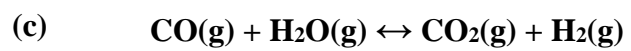6) **Predict the effect of <u>decreasing</u> the temperature on the position of the following equilibria.**

(a) $H_2(g) + Cl_2(g) \leftrightarrow 2HCl(g) + 49.7 \text{ kJ}$
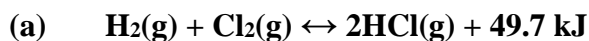
Equilibrium will shift to favor products.

(b) $2NH_3(g) \leftrightarrow N_2(g) + 3H_2(g)$ $\Delta H = 37.2 \text{ kJ}$

Equilibrium will shift to favor reactants.

(c) $CO(g) + H_2O(g) \leftrightarrow CO_2(g) + H_2(g)$ $\Delta H = -27.6 \text{ kJ}$

Equilibrium will shift to favor products.