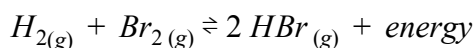


Equilibrium Constant - Worksheet 1

1. Write the equilibrium expression for the following reactions:

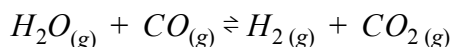
- $wW + xX \rightleftharpoons uU + vV$
- $H_2O_{(g)} + CO_{(g)} \rightleftharpoons H_2_{(g)} + CO_2_{(g)}$
- $COCl_{2(g)} \rightleftharpoons CO_{(g)} + Cl_2_{(g)}$
- $H_2_{(g)} + Cl_2_{(g)} \rightleftharpoons 2HCl_{(g)} + \text{energy}$
- $CO_{(g)} + NO_2_{(g)} \rightleftharpoons NO_{(g)} + CO_2_{(g)}$
- $Zn_{(s)} + 2Ag^+_{(aq)} \rightleftharpoons Zn^{2+}_{(aq)} + 2Ag_{(s)}$
- $C_2H_6_{(g)} \rightleftharpoons H_2_{(g)} + C_2H_4_{(g)}$

2. Consider the following equilibrium reaction:



The K_{eq} for this reaction at 25°C is 1.02. At equilibrium the concentration of HBr is 0.50mol/L. Assuming H_2 and Br_2 are present in equal amounts, calculate the concentration of H_2 at equilibrium.

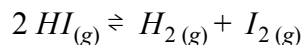
3. Analysis of the following equilibrium reaction at 900°C provides the concentrations listed below:



Experiment	[H ₂ O]	[CO]	[H ₂]	[CO ₂]
1	0.352	0.352	0.148	0.648
2	0.266	0.266	0.234	0.234
3	0.686	0.186	0.314	0.314

Write the equilibrium expression for the reaction and calculate the value of the equilibrium constant for each experiment.

4. In the following reaction at 448°C, the equilibrium concentrations are HI = 0.0040M, H_2 = 0.0075M, I_2 = 0.000043M. Calculate the equilibrium constant given the reaction below:



5. If the temperature of an exothermic reaction at equilibrium is lowered, is the value of K_{eq} increased or decreased?