Le Chatelier's Principle-Problems

#35 (d) $2NO + 2H_2 \rightleftarrows N_2 + 2H_2O + ?kJ$

* increase temp- stress
* to lower temp. – shift to reactants
* Consequence – temp. lowers

Gas pressure is a stress.

Change in volume affects pressure

vol. ↓ then pressure ↑

vol. ↑ then P ↓

p. 533 # 3 (b) $4HCl + O_2 \rightleftarrows 2Cl_2 + 2H_2O$

Lower volume = greater pressure (stress)

5 moles total

4 moles gas

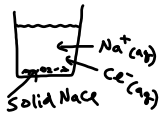
Shift → products

Solubility Equilibrium - Ksp

Definitions-

1. solute (dissolves in....)
2. solvent (dissolves solute)
3. Types of solutions-
   a) Unsaturated- dissolves less than max. possible
   b) Saturated – max. possible dissolved
   c) Super Saturated – unstable solution greater than max.

Solubility Equilibrium-Ksp continued



$NaCl_{(s)} \rightleftarrows Na^+_{(aq)} + Cl^-_{(aq)}$

Deriving a Ksp Expression

Recall- $NaCl_{(s)} \rightleftarrows Na^+_{(aq)} + Cl^-_{(aq)}$

Not very soluble $AgCl_{(s)} \rightleftarrows Ag^+_{(aq)} + Cl^-_{(aq)}$

Write K_{eq} expression

$$K_{eq} = \frac{[Ag^+][Cl^-]}{[AgCl]}$$

K_{eq}: constant

$[AgCl]$: solid = constant

$$K_{eq} \cdot [AgCl] = [Ag^+][Cl^-]$$

$K_{eq} \cdot [AgCl]$: new constant

$$K_{sp} = [Ag^+][Cl^-]$$

K_{sp}: Solubility Product

1.8×10^{-10}

Lab Calculations-Ksp

1. $Ca(OH)_{2(s)} \rightleftarrows Ca^{2+}_{(aq)} + 2OH^-_{(aq)}$
2. $K_{sp} = [Ca^{2+}][OH^-]^2$
3. Why analyze $[OH^-]$ only?