Le Chatelier's Principle-Lab Questions

2. Favours reactants (pink) when H_2O added
3. Favours products (blue) when Cl^- added
4. Expect less Cl^- (precipitated) favouring reactants (pink)
6. Heat causes shift → blue
   Cooling causes shift → pink

Patterns -

* add reactant → more products
* add product → more reactants
* remove reactant → more react (less prod.)
* heat + cold.....

Le Chatelier's Principle

If a system at equilibrium is stressed, it will "shift" (Reactant/product) to reduce the stress.

Example - p. 528 sample problem

$$PCl_{5(g)} + \text{heat} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$$

	Stress	Shift	Consequences
a)	↑ PCl_5	P roduct	lowers PCl_5
b)	↓ Cl_2	product	raises $[Cl_2]$
c)	↓ heat	reactants	raise heat
d)	↑ P_{tot}	fewer moles of gas	Reactant side has 1 mol gas product side has 2 mol gas "Reactant"
e)	catalyst	no shift	

Summary - Read table 13-2 p. 528

Stresses - Pressure, [ ], and temp.

Questions - p. 533 #1-5
p. 536 #20

Solubility Product Equilibrium

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

Also - $AgCl_{(s)} \rightleftharpoons Ag^+_{(aq)} + Cl^-_{(aq)}$ (not soluble)

Write K_{eq} expression.

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

Solid AgCl is constant

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

($K_{eq} \times [AgCl]$: constant)

new constant

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

for AgCl $K_{sp} = 1.8 \times 10^{-10}$