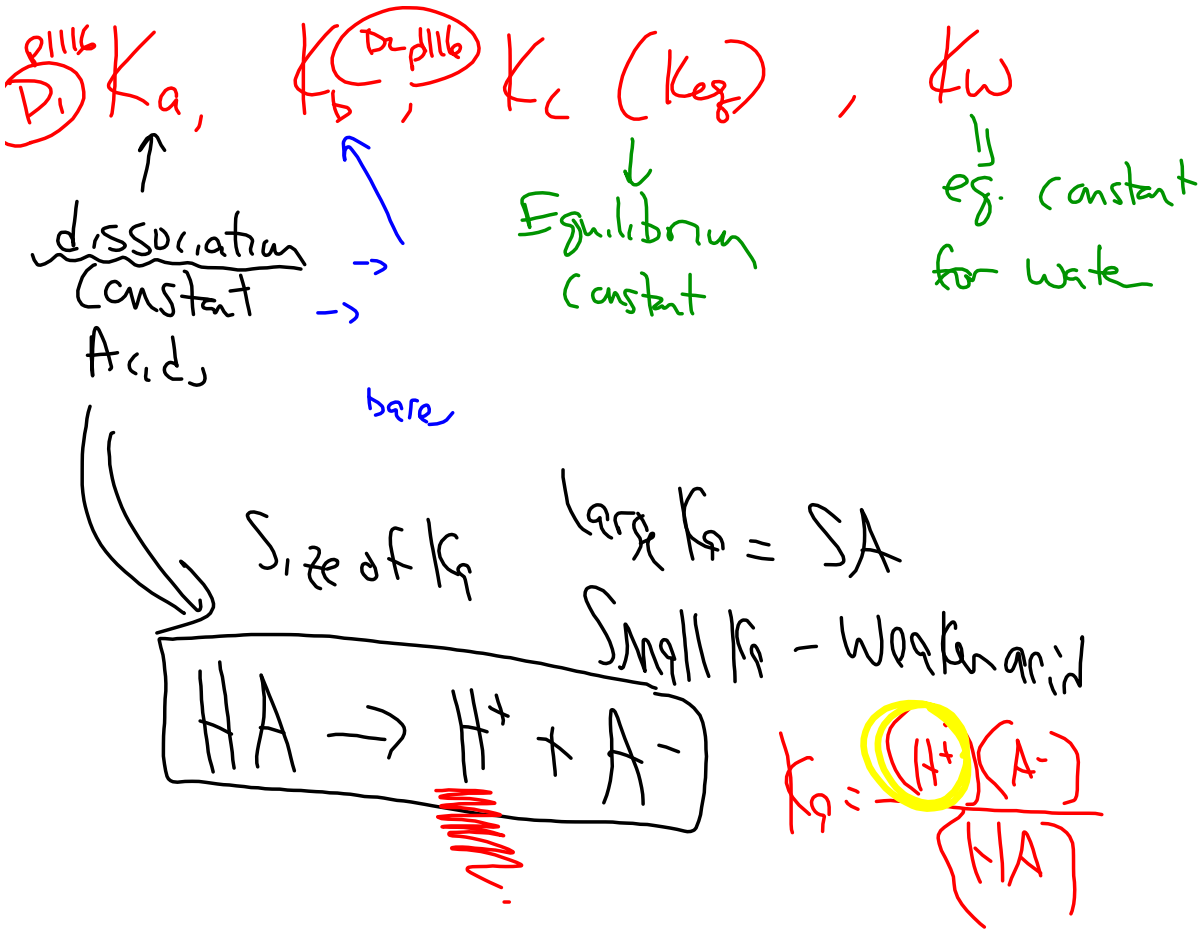
17.44 $NH_3 + HCl \rightarrow NH_4^+ + Cl^-$

B A CA CB

① Neutralize using moles!

② Recalc new M from Equilibrium

③ Find pH, pOH, $[H^+]$, $[OH^-]$



K_{sp} P1116 Table D3 - Solubility Product Constant

explains how much of the substance will dissolve.

Soluble → Slightly Soluble (Sparingly Soluble) ← Insoluble

100% dissolve

≈ <1% dissolve

Least Soluble → smallest # MnS

Manganese Sulfite $K_{sp} = 2 \times 10^{-53}$

$PbCO_3$ $K_{sp} = 7.4 \times 10^{-14}$

$$PbCO_3(s) \rightarrow Pb^{+2}(aq) + CO_3^{-2}(aq)$$

(x) (x) [x]

K [Products] / [reactants] ignore (s) and (l)

$$K_{sp} = \frac{[Pb^{+2}][CO_3^{-2}]}{1}$$

$7.4 \times 10^{-14} = (x)(x)$

$2.72 \times 10^{-7} M \ [CO_3^{-2}]$

$0.000000272 M \ [CO_3^{-2}]$

Calcium Fluoride $[Ca^{+2}]$ $[F^-]$

$$CaF_{2(s)} \rightarrow Ca^{+2}_{(aq)} + 2F^-_{(aq)}$$

Molar Ratio	X	X	2X
		$2.14*10^{-4}$	$4.28*10^{-4}$

$$K_{sp} = \frac{[Ca^{+2}][F^-]^2}{1}$$

$$3.9*10^{-11} = (X)(2X)^2$$

$$3.9*10^{-11} = (X)(4X^2)$$

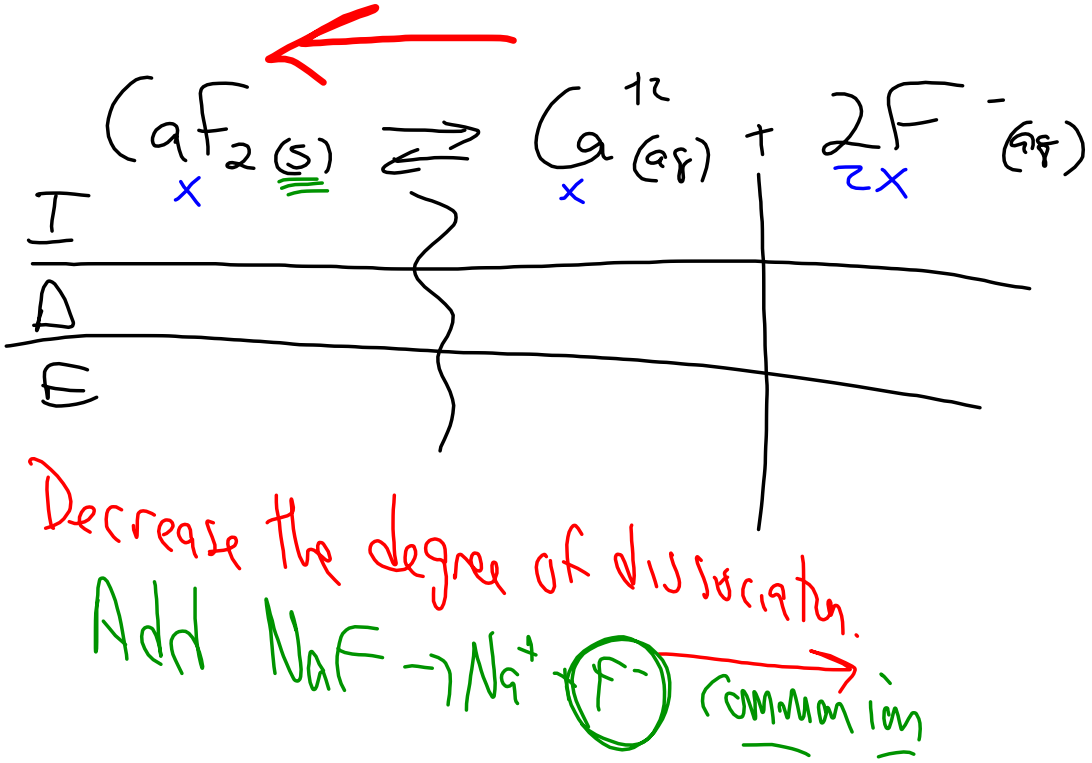
$$= 4X^3$$

$$X = 2.14*10^{-4}$$

$Q > K$ precipitate of extra.

$Q = K$ At Eq Sat'd

$Q < K$ Unsat → Add More Solute,



Decrease the degree of dissociation.

Add NaF → Na^+ + F^- common ion

17 / 49 + 53