

$K_{sp}$  Solubility product constant  
 ↳ Items barely soluble!  
 P125 Solubility table.

**Soluble** → 100% breaks up similar to SA/SB

Not very Soluble → < 5% soluble.

$K = \frac{[\text{Products}]}{[\text{Reactants}]}$  ← how much breaks up.

$HX \rightarrow H^+ + X^-$

Large  $K$  = More soluble

Mar 9-7:40 AM

$Q < K$   
 $R \rightarrow P$

$K$   
 EQ

$Q > K$   
 $\leftarrow P$

↳ PPT  
 Extra

Mar 9-8:19 AM

**CaF<sub>2</sub>** K<sub>sp</sub> all start as SOLIDS.

① Write eqn  $\text{CaF}_2(\text{s}) \xrightarrow{\text{H}_2\text{O}} \text{Ca}^{+2}(\text{aq}) + 2\text{F}^{-}(\text{aq})$

② Molar RATIO  $X \text{ M}$   $X \text{ M}$   $2 \times \text{M}$   
 $2.14 \times 10^{-4}$   $4.28 \times 10^{-4}$

③ Write K<sub>sp</sub> expression.  
 $K_{sp} = [\text{Ca}^{+2}][\text{F}^{-}]^2$   
 (SOLIDS)  $\rightarrow 1$

④ Plug in #2 into #3  
 $3.9 \times 10^{-11} = (X)(2X)^2$   
 Plug  $= (X)(4X^2)$   
 $= 4X^3$   
 $X = 2.14 \times 10^{-4}$

⑤ Solve

Mar 9-8:21 AM

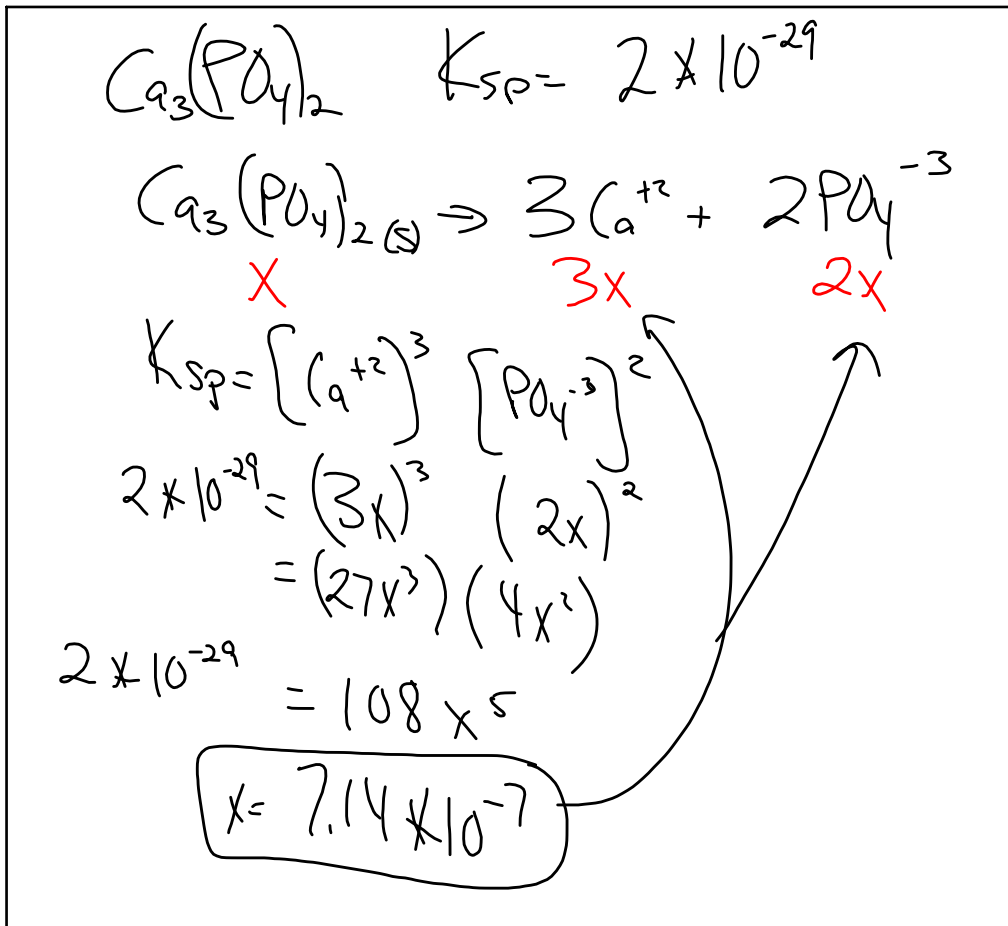
$\text{CaF}_2(\text{s}) \rightleftharpoons \text{Ca}^{+2}(\text{aq}) + 2\text{F}^{-}(\text{aq})$

**Add in soluble NaF**

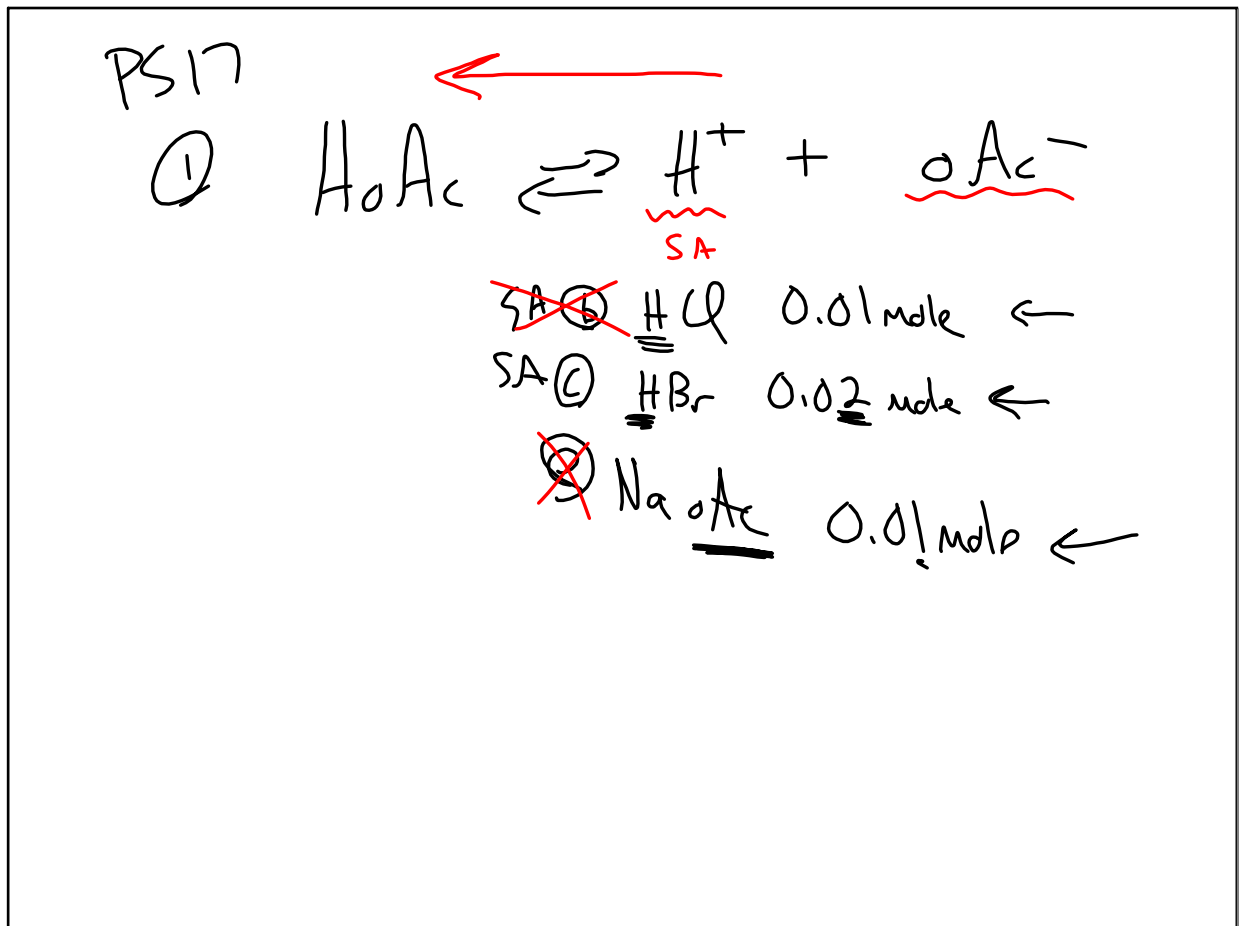
~~Na<sup>+</sup>~~ + F<sup>-</sup>  
 No common ion.

Solubility of CaF<sub>2</sub> DECREASES

Mar 9-8:28 AM



Mar 9-8:32 AM



Mar 9-8:37 AM

3) HF 0.1M, WA  
 Sol salt  
 0.1M  $K^+$  and 0.1M  $F^-$

$HF \rightarrow H^+ + F^-$

I 0.1	0	0 + 0.1
$\Delta -x$	$+x$	$+x$
E 0.1-x	x	0.1+x

(Common ion)

Mar 9-8:43 AM