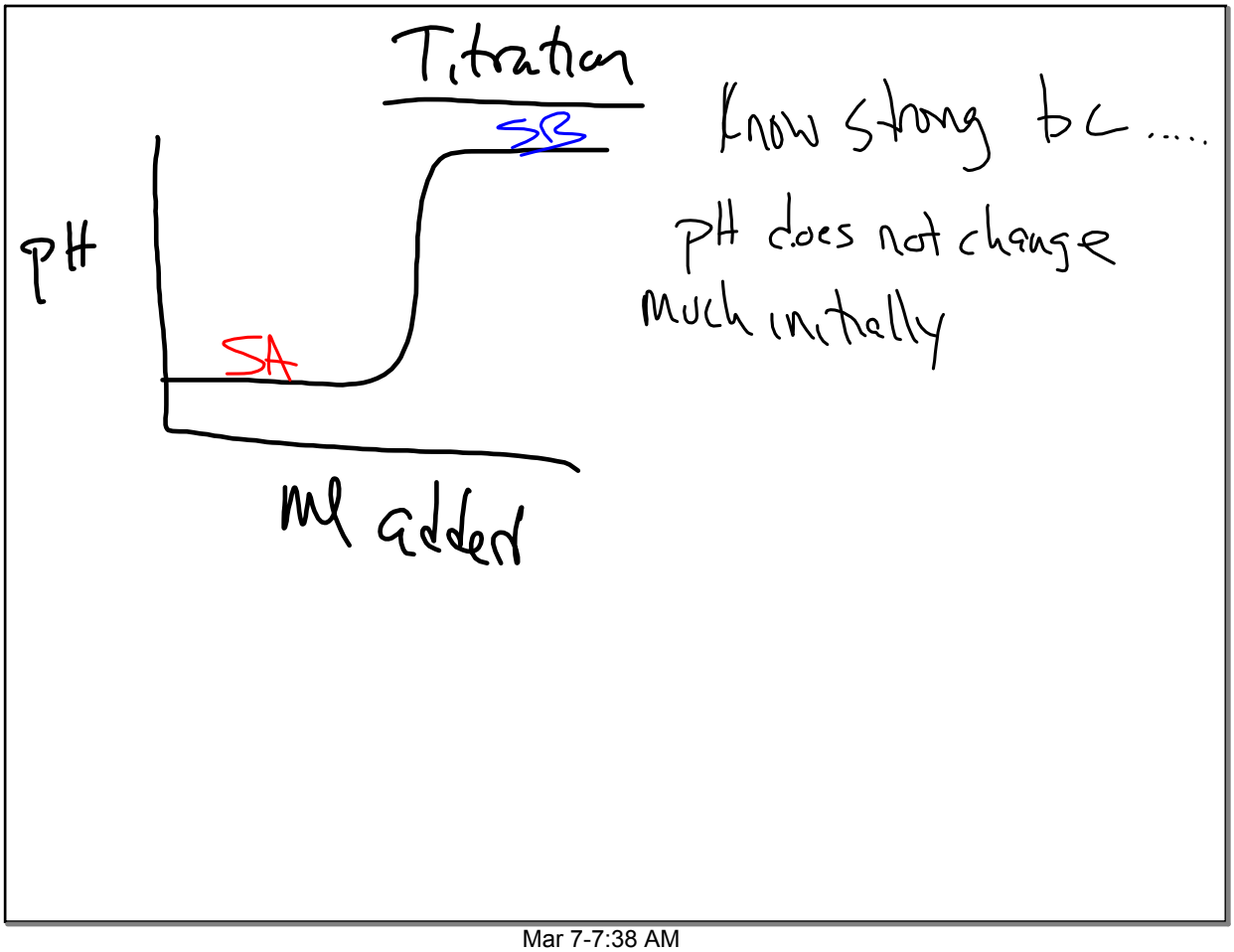
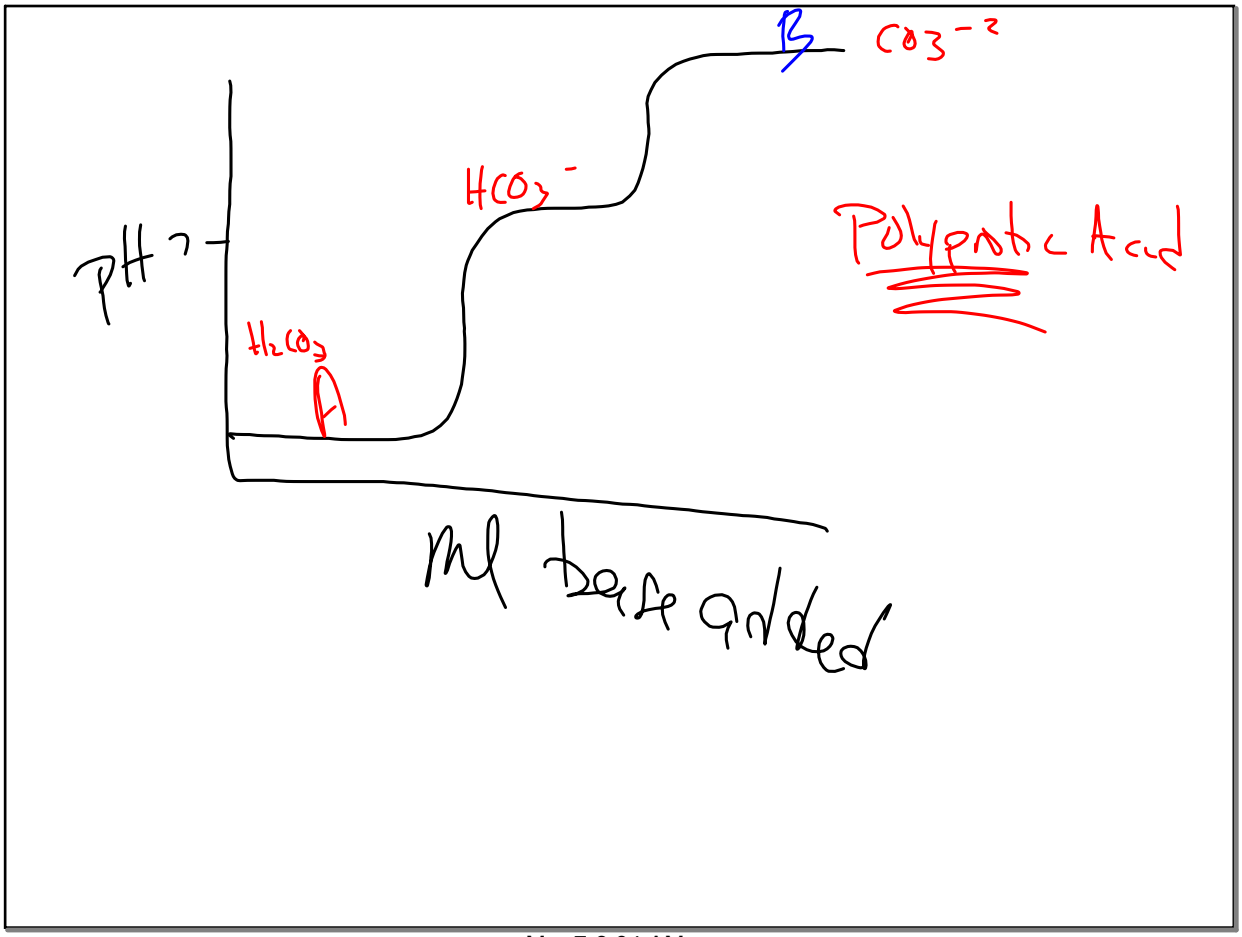
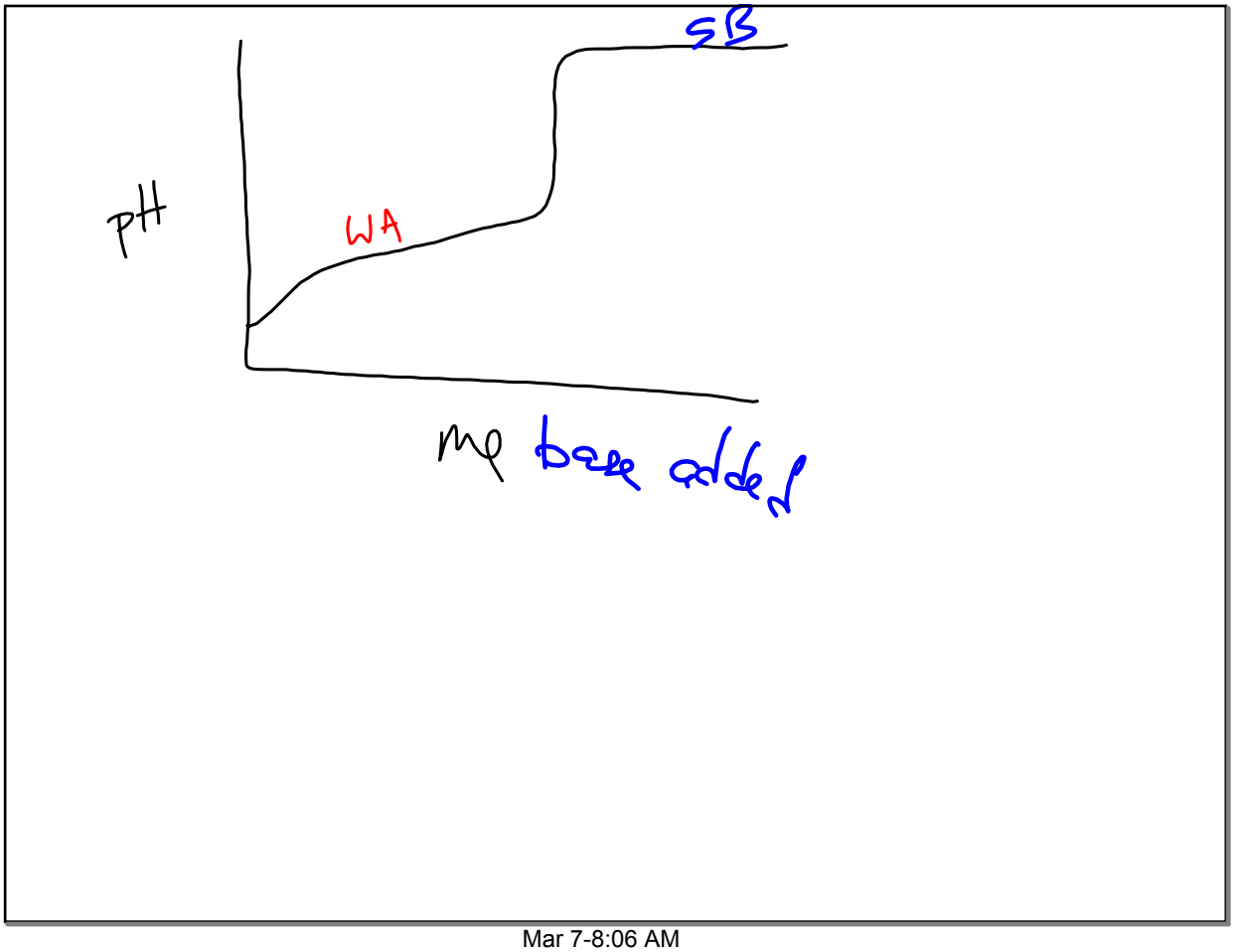


Mar 7-7:38 AM



Mar 7-8:04 AM



Mar 7-8:06 AM

Q 50mL 0.1M HCl + 49mL 0.1M NaOH.

Find pH

$HCl + NaOH \Rightarrow NaCl + HOH$

NET IONIC $H^+ + OH^- \rightarrow HOH$

	H^+	OH^-	HOH
I	0.005	0.0049	∅
Δ	−0.0049	−0.0049	+0.0049
E	0.0001	∅	0.0049

MOLES BUT Neutralize

50mL + 49mL

$\frac{0.0001 \text{ moles}}{0.099 \text{ L}} = 0.001 M H^+ = 1 \times 10^{-3} M H^+$

pH = 3

Mar 7-8:16 AM

b) 50 ml 0.1M HCl + 49.5 ml NaOH.

$H^+ + OH^- \rightarrow HOH$

Moles	H^+	OH^-	HOH
I	0.005	0.00495	∞
Δ	−0.00495	−0.00495	
E	0.00005	∞	

Recall $\frac{5*10^{-5}\ moles}{0.0995\ l} = 5*10^{-4}\ (H^+)$ pH = 3.3

Mar 7-8:26 AM

c) 50ml 0.1M HCl + 49.9 ml NaOH.

$H^+ + OH^- \rightarrow HOH$

Next moles	H^+	OH^-	HOH
I	0.005	0.00499	
Δ	−0.00499	−0.00499	
E	0.000001	∞	

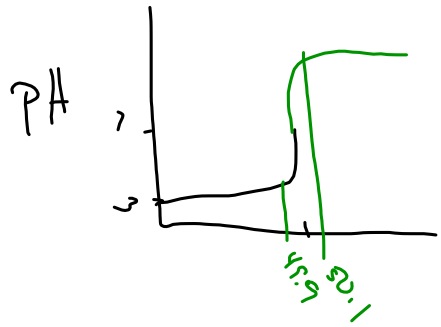
$\frac{1*10^{-5}\ moles}{0.0999\ l} = 1*10^{-4}$ pH = 4

Mar 7-8:30 AM

(d) 50ml 0.1M HCl + 50ml 0.1M NaOH.

Equal #'s ⇒ Equal moles

pH = 7



Mar 7-8:36 AM

(e) 50ml 0.1M HCl + 50.1 ml 0.1M NaOH

$H^+ + OH^- \rightarrow H_2O$

Neut moles

	H^+	OH^-
I	0.005	0.00501
Δ	−0.005	−0.005
E	∅	0.00001

$\frac{1 \times 10^{-5} \text{ moles } OH}{0.101\ l} = 9.99 \times 10^{-5} M [OH^-]$

101ml

pOH = 4

pH = 10

Mar 7-8:38 AM

(3) Calc pH at equivalence point of: 50 mL 0.1 M
50mL 0.1M $HOAc$ + $NaOH$

net ionic $HOAc + NaOH \rightleftharpoons NaOAc + HOH$

Neut Moles	$HOAc$	$NaOH$	$NaOAc$	HOH
I	0.005	0.005		
Δ	−0.005	−0.005	+0.005	
E	0	0	0.005	

Equivalence PT

Recall M

$\frac{0.005 \text{ moles}}{0.1 \text{ L}} = 5 \times 10^{-2} M\ OAc^-$

If no H^+/OH^- Add HOH!

Mar 7-8:44 AM

(3 cont'd) pH $5 \times 10^{-2} M\ OAc^-$ $K_a \times K_b = K_w$

BASE H^+ acceptor Conj. Acid

$OAc^- + HOH \rightarrow HOAc + OH^-$

	OAc^-	HOH	$HOAc$	OH^-
I	$5 \times 10^{-2} M$		0	0
Δ	$-x$		$+x$	$+x$
E	$5 \times 10^{-2} - x$		x	x

$K_b = \frac{[HOAc][OH^-]}{[OAc^-]} = \frac{x^2}{5 \times 10^{-2}} = 5.56 \times 10^{-11}$

$x = 1.67 \times 10^{-6} = [OH^-]$

$pH = 8.22$

Mar 7-8:53 AM

3) 50ml 0.1M HOAc + 49ml 0.1M NaOH.

$HOAc + NaOH^- \rightleftharpoons NaOAc^- + HOH$

Net I	0.005	0.0049	0	
Moles Δ	-0.0049	-0.0049	+0.0049	
E	0.0001	0	0.0049	
	0.099l		0.099l	
Recall M	$1.01*10^{-3}$ M HOAc		$4.95*10^{-2}$ M OAc^-	

$$PH = -\log(1.8*10^{-5}) + \log\frac{4.95*10^{-2}}{1.01*10^{-3}} = 6.44$$

Mar 7-9:00 AM

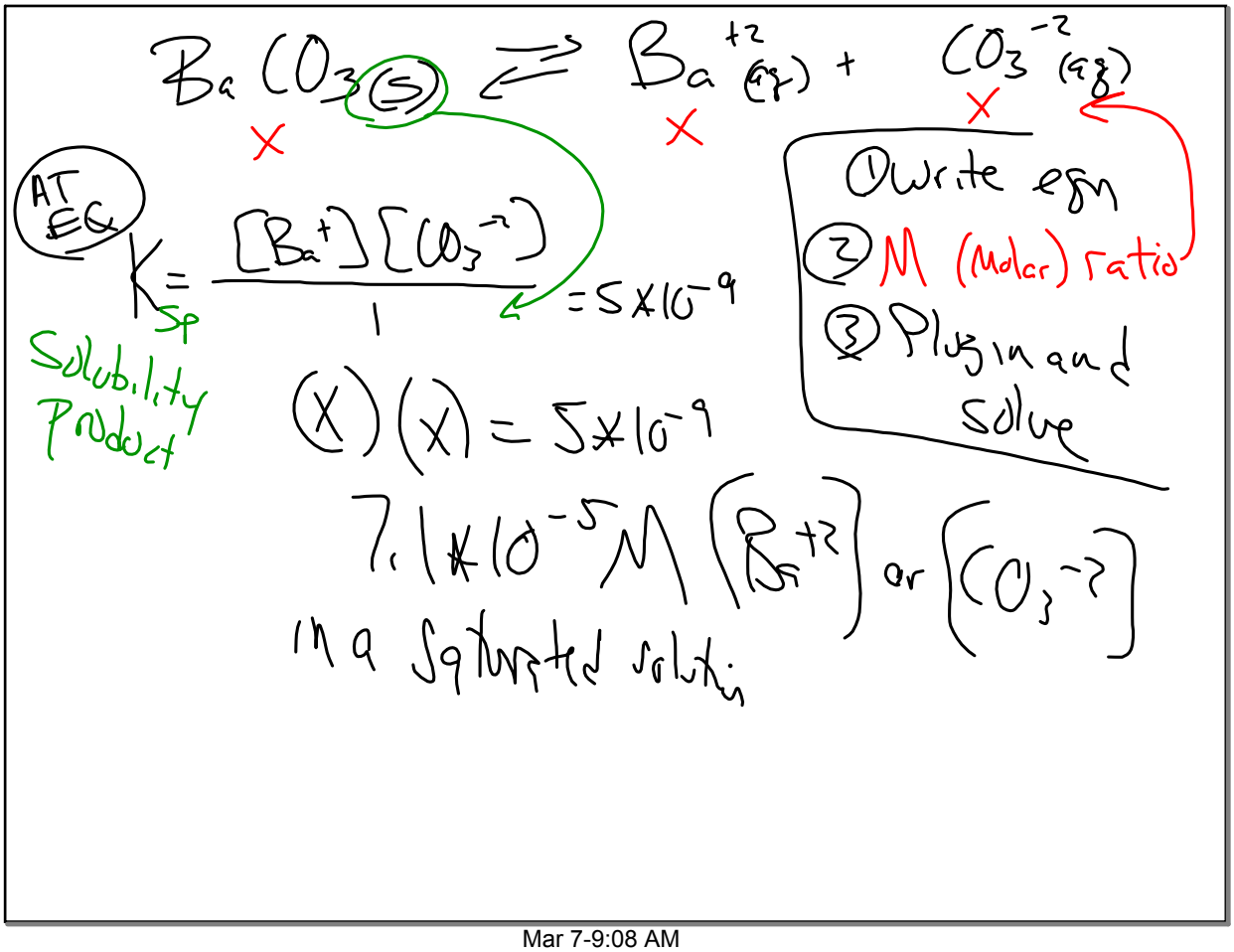
Solubility equilibrium.

Ksp on page 1116

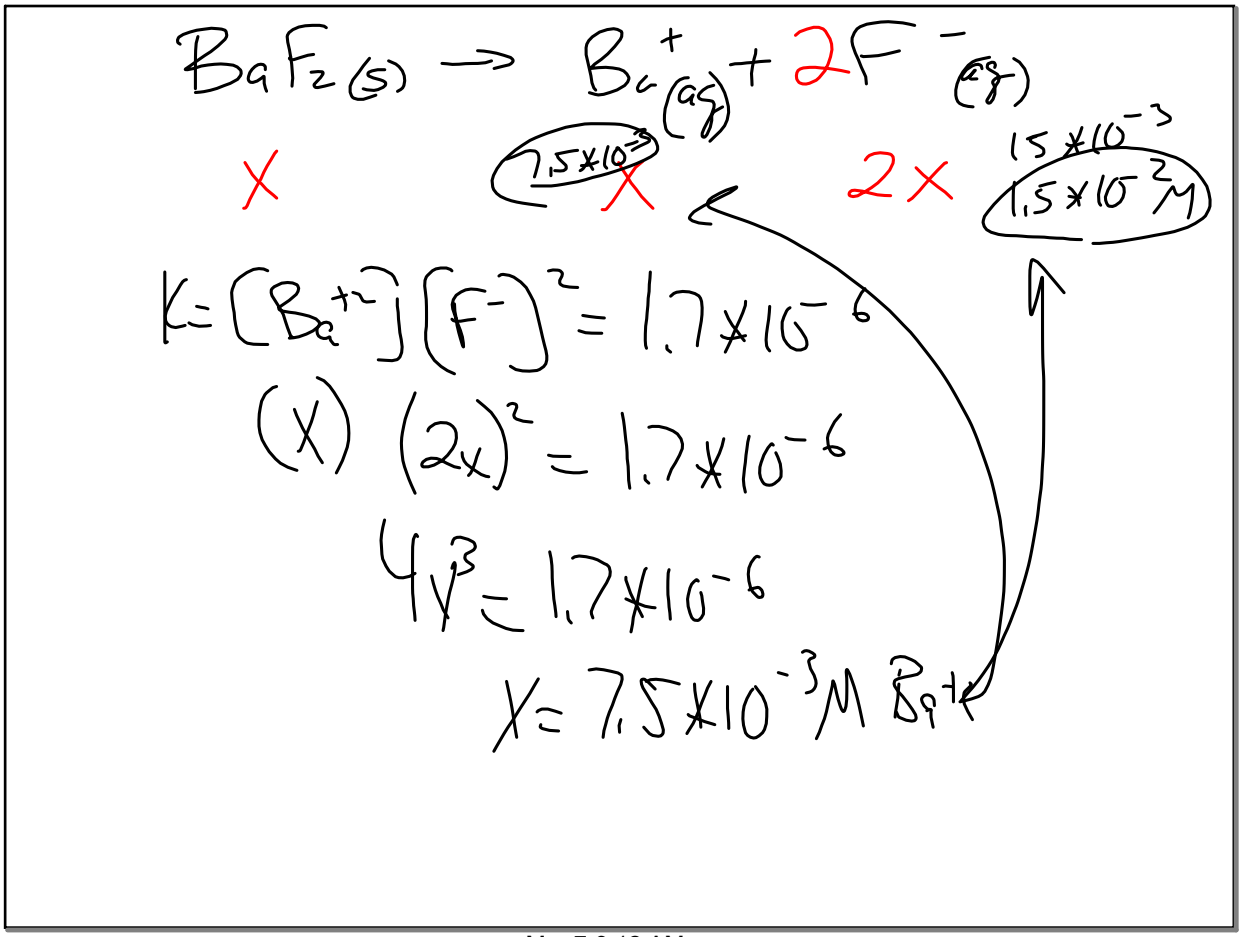
"insoluble" solids.

break up so very little.

Mar 7-9:07 AM



Mar 7-9:08 AM



Mar 7-9:12 AM

HW

17/ 42 a+d, 54

Mar 7-9:15 AM