

⑧ 0.02 M HX $K_a = 3.15 \times 10^{-7}$

$\overset{\text{WA}}{\text{HX}} \rightarrow \overset{\text{WA}}{\text{H}^+} + \overset{\text{CB}}{\text{X}^-}$

I	0.02	0	0
D	-x	+x	+x
E	0.02-x	x	x

$K_a = \frac{x^2}{0.02} = 3.15 \times 10^{-7}$

$x = 7.94 \times 10^{-5}$

$\text{pH} = -\log(\text{H}^+)$
 $\text{pH} = 4.1$

Degree of Dissoc. \rightarrow
 $\frac{7.94 \times 10^{-5}}{0.02} = 0.003975$
 $\% \text{I} = 0.3975\%$

Mar 16-7:35 AM

$\text{H}_2\text{O} + \text{H}^+ \rightarrow \text{H}_3\text{O}^+$
 BASE = H^+ acceptor
 CA

(A) $\text{H}_2\text{O} \rightarrow \text{H}^+ + \text{OH}^-$
 CB

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(14) $\text{HCl} \Rightarrow \text{H}^+ + \text{Cl}^-$
 2.5M [2.5M]

$K_w = (\text{H}^+)(\text{OH}^-) = 1 \times 10^{-14}$ (25°C)

OH^- hydroxide
 $\text{H}_3\text{O}^+ = \text{H}^+ (\text{aq})$
 hydronium ion

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(17) $\text{HNiCl} \Rightarrow \text{H}^+ + \text{NiCl}^-$

T	0.1	0	0
Δ	-x	+x	+x
E	0.1-x	x	x

$\frac{x^2}{0.1-x} = 1.4 \times 10^{-5}$

$x^2 = 1.4 \times 10^{-6}$

$x = 0.00118 \text{ M}$

$\frac{0.00118}{0.1} = 0.0118$

Mar 16-8:03 AM

(20) (SB) NaOH + (SA) HCl
 25ml 0.01M 10ml 0.02M
 2.5×10^{-4} mole 2×10^{-4} mole

(1) Next using Molar

NaOH	+ HCl	→	NaCl	+ H ₂ O
I 2.5×10^{-4}	2×10^{-4}			
Δ -2×10^{-4}	-2×10^{-4}			
E 0.5×10^{-4}	0			

P_{OH} = -log([OH])
 2.84
PH = 11.16

(2) Reqd. New M
 $\frac{0.5 \times 10^{-4} \text{ mole}}{0.035 \text{ L}} = 1.43 \times 10^{-3} \text{ M } (\text{OH}^-)$

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(22) $\text{Zn}_3(\text{PO}_4)_2 \rightarrow 3 \text{Zn}^{+2} + 2 \text{PO}_4^{-3}$
M Ratio ~~X~~ (S) (3x) (g) (2x) (g)

$K_{sp} = \frac{(\text{Zn}^{+2})^3 (\text{PO}_4^{-3})^2}{1} = (3x)^3 (2x)^2 = 108x^5$

(23) $\text{MgCO}_3 \rightarrow \text{Mg}^{+2} + \text{CO}_3^{-2}$
M Ratio
~~X~~ ~~X~~ ~~X~~

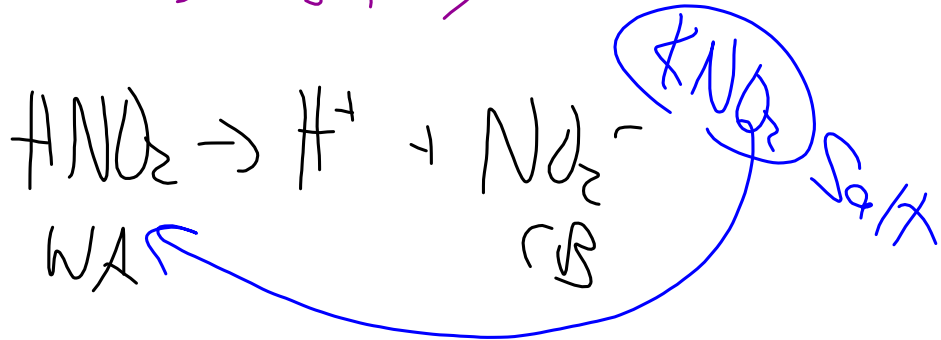
$K_{sp} = [\text{Mg}^{+2}] [\text{CO}_3^{-2}] = 1 \times 10^{-5}$
 (X) (X) = → $X = 3.16 \times 10^{-3}$

Mar 16-8:11 AM

(25)
$$pH = pK_a + \log \frac{b}{a}$$

$$= -\log(4.5 \times 10^{-4}) + \log \frac{0.7}{0.45}$$

$$= 3.35 + \rightarrow$$



Mar 16-8:18 AM

(26) $HClO_4$ + KOH

① $25\text{ mL } 0.723\text{ M}$ $10\text{ mL } 0.273\text{ M}$

0.018075 moles 0.00273 moles

-0.00273 -0.00273

0.015345 mole 0

0.0384 M $0.4384\text{ M } (H^+)$

② Recalc now M

~~$HClO_4 + KOH \rightarrow KClO_4 + H_2O$~~

Mar 16-8:20 AM

(29)

moles A

moles B

$$\text{nmol} = \text{nmol}$$

$$\frac{(2)M(\cancel{50\text{me}})}{100} = \frac{(1)(0.375)(62.5\text{me})}{100}$$

Mar 16-8:24 AM