

① $\text{HOCN} \rightleftharpoons \text{H}^+ + \text{OCN}^-$
 (SA) NaOCN salt. NaOCN
 dissociation \rightarrow

If add more products (H^+ or OCN^-)
 the reaction \leftarrow

② decreases degree of dissociation

③ No common ion \checkmark
~~④ 0.01M H^+~~ \checkmark
 ⑤ 0.02M H^+ \checkmark

⑥ No common ion \times
~~⑦ 0.01M OCN^-~~ \checkmark

Mar 15-7:36 AM

② ~~HCN~~ and ~~KCN~~ (con, base) \rightarrow KOH (SB)
~~WA~~ HCN \rightarrow HCN (WA)

$\text{HCN} \rightleftharpoons \text{H}^+ + \text{CN}^-$

I	0.1	0	0 + 0.1
A	-x	+x	+x
E	0.1-x	x	0.1+x

③ $\text{HF} \rightleftharpoons \text{H}^+ + \text{F}^-$ (common ion)

I	0.1	0	0 + 0.1
A	-x	+x	+x
E	0.1-x	x	0.1+x

$K_a = \frac{x(0.1+x)}{0.1-x}$

③ $\text{KF} \rightarrow \text{K}^+ + \text{F}^-$
 0.1 0.1 0.1

Mar 15-8:03 AM

⑤ 0.75 NH₃ B
 mole
 $K_b = 1.8 \times 10^{-5}$

0.25 NH₄Cl A
 $\text{NH}_4^+ \quad \text{Cl}^-$

$\text{NH}_3 + \text{H}^+ \rightarrow \text{NH}_4^+$
 BASE
 proton acceptor

$\text{pH} = \text{pK}_a + \log \frac{b}{a}$
 $= \log \left(\frac{1 \times 10^{-14}}{1.8 \times 10^{-5}} \right) + \log \frac{0.75}{0.25}$

Mar 15-8:13 AM

⑥ 0.15 mole KOAc + 2M HOAc

Salt
 WA
 H^+

orig base
 OAc⁻

SA
 + H⁺ → reduce pH
 p7.2

Mar 15-8:16 AM

② Net MOLES $n_{ML}^A = n_{ML}^B$

$8.25 \times 10^{-3} \text{ mole KOH}$ + $9.425 \times 10^{-3} \text{ mole HCl}$

45ml 0.183M 65ml 0.145M

① Net / MOLES

	8.25×10^{-3}	9.425×10^{-3}		
I	8.25×10^{-3}	9.425×10^{-3}	8.25×10^{-3}	8.25×10^{-3}
D	-8.25×10^{-3}	-9.425×10^{-3}	$+8.25 \times 10^{-3}$	
F		1.19×10^{-3}		

② Recalc new M 110 ml 0.112

$\frac{1.08 \times 10^{-2} \text{ mole } (H^+)}{0.112}$

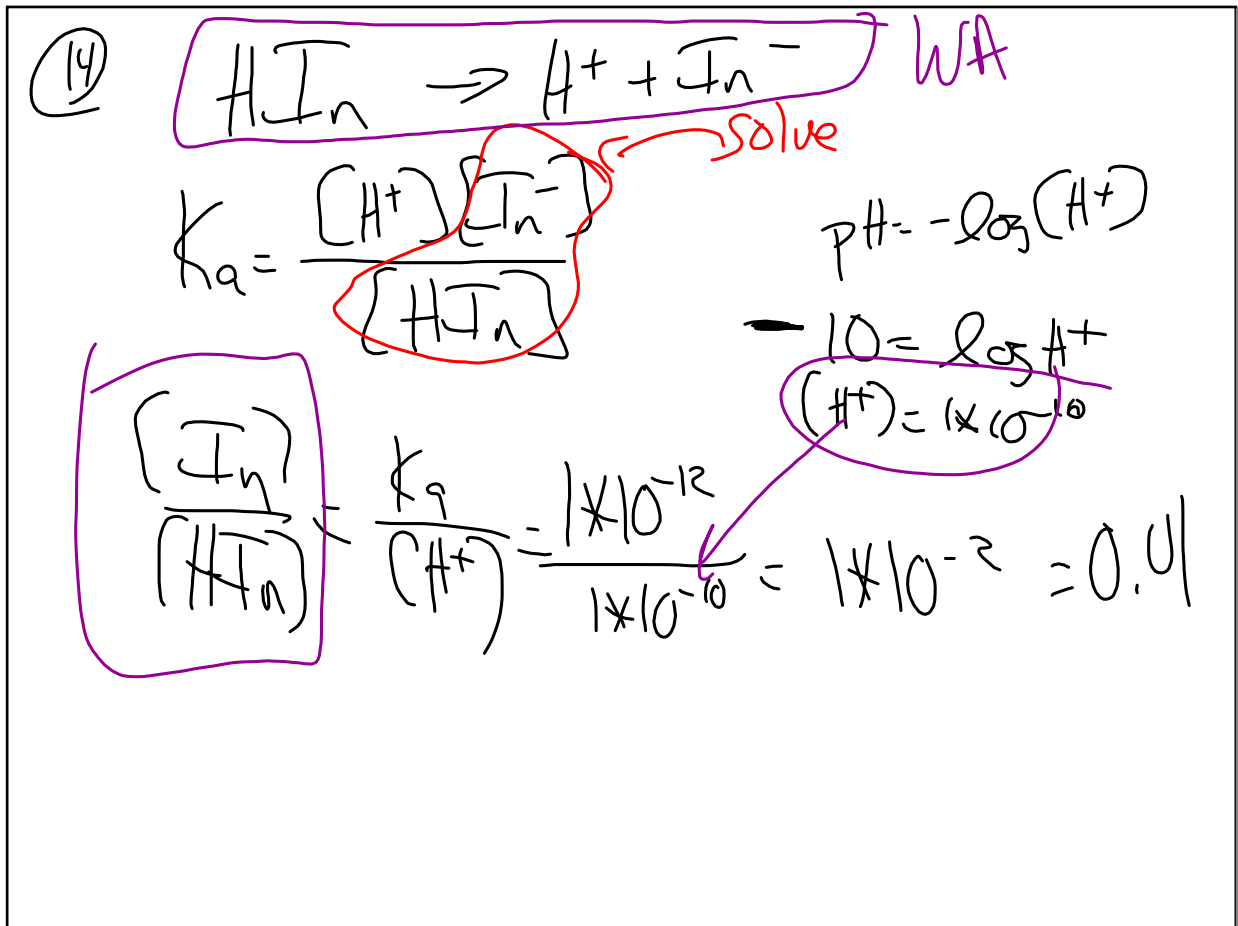
$pH = -\log_2(H^+) = 1.97$

Mar 15-8:24 AM

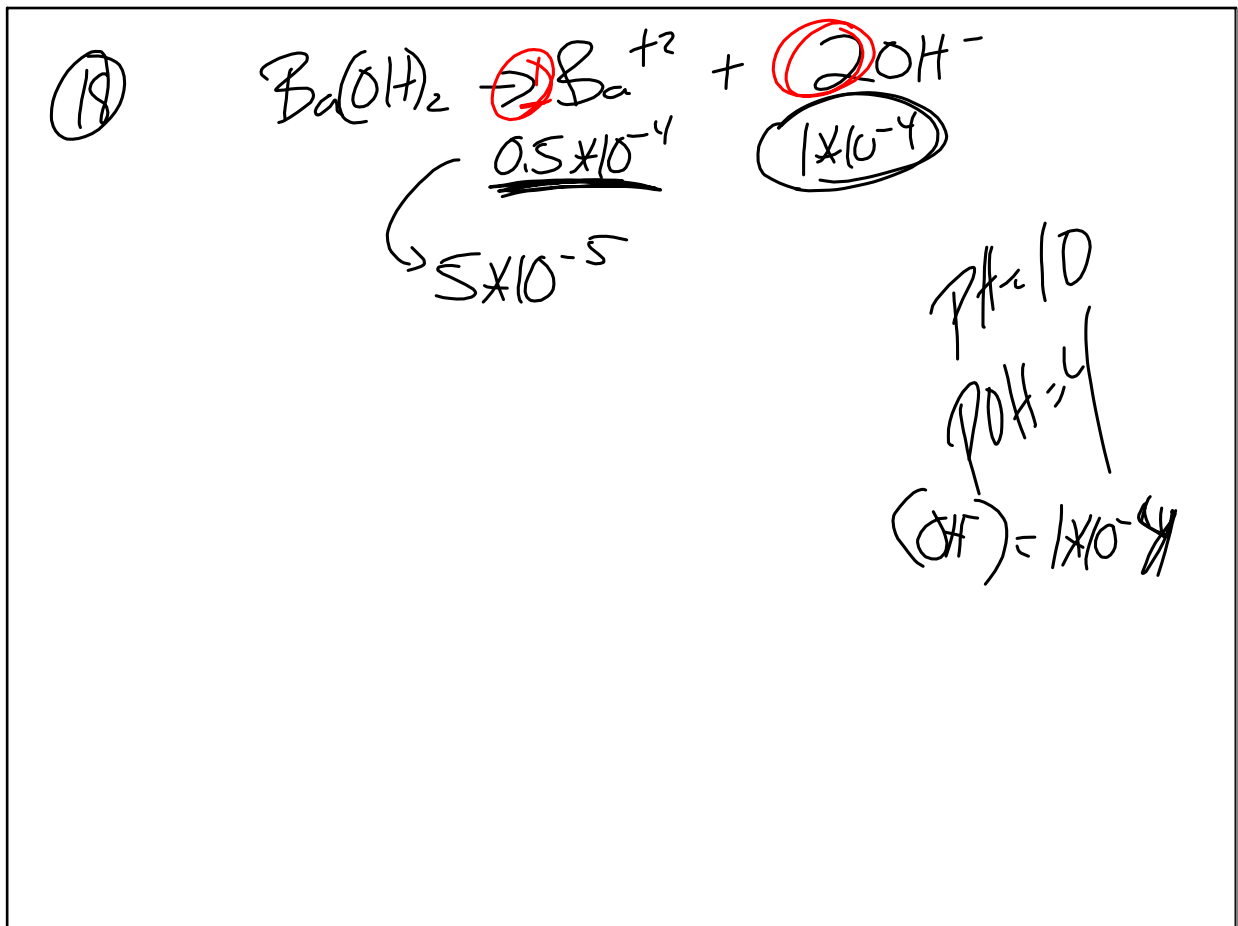
③ $n_{ML}^A = n_{ML}^B$

$(1)M(25.5) = (1)(0.175)(37.5)$

Mar 15-8:38 AM



Mar 15-8:40 AM



Mar 15-8:47 AM

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$$\text{CaSO}_4(s) \rightarrow \text{Ca}^{+2} + \text{SO}_4^{-2}$$

~~RATIO~~

$K_{sp} = [\text{Ca}^{+2}][\text{SO}_4^{-2}]$

0.205 g CaSO₄ / 0.1 L

1.54 x 10⁻³ M CaSO₄

Mar 15-8:51 AM

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$$\text{Ca(OH)}_2(s) \rightarrow \text{Ca}^{+2} + 2\text{OH}^-$$

~~RATIO~~

$K_{sp} = [\text{Ca}^{+2}][\text{OH}^-]^2$

$= (3.15 \times 10^{-2})(6.3 \times 10^{-2})^2$

$= 1.25 \times 10^{-4}$

pH = 12.8
pOH = 1.2
pOH = -log(OH⁻)
-1.2 = log(OH⁻)
[OH⁻] = 6.3 x 10⁻²

Mar 15-8:54 AM

E2 ZOT SB

③ $\text{KOH} \rightarrow \text{K}^+ + \text{OH}^-$

x x x

$\frac{5.61 \text{ g KOH}}{0.5 \text{ L}} \Bigg| \frac{1 \text{ mole KOH}}{56 \text{ g}} = \boxed{0.2 \text{ M KOH}} = 0.2 \text{ M } [\text{OH}^-]$

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

$\text{pOH} = \log$ ↑

$\text{pOH} = 0.7$

$\text{pH} = 13.3$

Mar 15-9:01 AM

④ $\text{NH}_4^+ \rightarrow \text{H}^+ + \text{NH}_3$ $K_a = 5.6 \times 10^{-10}$

ACID → **PROTON DONOR**

$\text{HCN} \rightarrow \text{H}^+ + \text{CN}^-$ $K_a = 4.8 \times 10^{-10}$

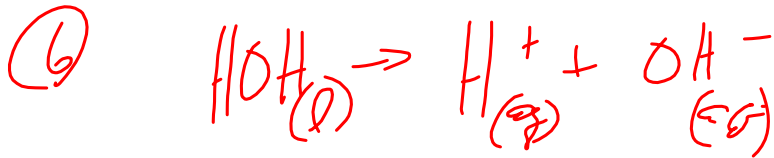
~~$\text{NH}_4^+ \rightarrow \text{H}^+ + \text{NH}_3$ 5.6×10^{-10}~~

~~$\text{H}^+ + \text{CN}^- \rightarrow \text{HCN}$ $\frac{1}{4.8 \times 10^{-10}}$~~

$\text{NH}_4^+ + \text{CN}^- \rightarrow \text{NH}_3 + \text{HCN}$

~~K_a ACID~~

Mar 15-9:05 AM



$$K_w = [\text{H}^+][\text{OH}^-] = 4 \times 10^{-12}$$

$$(\cancel{X})(\cancel{X}) = 4 \times 10^{-12}$$

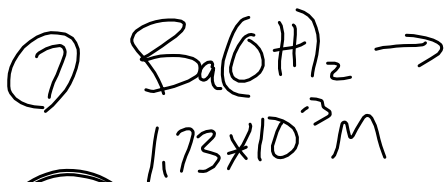
$$X^2 = 4 \times 10^{-12}$$

$$X = 2 \times 10^{-6} = (\text{H}^+)$$

$$\text{pH} = -\log$$

$$\begin{array}{l} 25^\circ\text{C} \\ [\text{H}^+][\text{OH}^-] = 1 \times 10^{-14} \\ (1 \times 10^{-7})(1 \times 10^{-7}) \end{array}$$

Mar 15-9:11 AM



$$1.73 \times 10^{-3} \text{ M}$$

$$2(1.73 \times 10^{-3})$$

$$3.46 \times 10^{-3} = (\text{OH}^-)$$

$\textcircled{\text{SB}}$

$$\text{pOH} = -\log$$

$$\text{pH} =$$

Mar 15-9:15 AM