

$HA \rightleftharpoons H^+ + A^-$ Generic WA

WA $\rightarrow K_a = \frac{[H^+][A^-]}{[HA]}$

Solve for pH of WA and salt of WA

$[H^+] = \frac{K_a [HA]}{[A^-]}$

$-\log(H^+) = -\log K_a - \log \frac{[HA]}{[A^-]}$

$pH = -\log K_a + \log \frac{[A^-]}{[HA]}$

$pH = pK_a + \log \frac{[A^-]}{[HA]}$ ← Base / Acid

H-H eqn
pH of a Buffer \Rightarrow WA + salt of WA
 \Rightarrow WB + salt of WB

Feb 28-8:30 AM

(17.16) ^{SALT 100%} 0.15M $Na^+ F^-$ ← common ion
 WA 0.2M $H F$

$H F$	\rightarrow	H^+	$+$	F^-	$-$
I 0.2		x		x	+0.15
Δ -x		+x		+x	
E 0.2-x		x		x	+0.15

$pH = pK_a + \log \frac{\text{base}}{\text{acid}}$

$pH = -\log(1.8 \times 10^{-4}) + \log \frac{0.15}{0.2}$

$pH = 3.62$

H-H.

$K_a = \frac{(H^+)(F^-)}{(HF)} = \frac{x(\cancel{x} + 0.15)}{(0.2 - \cancel{x})} = 1.8 \times 10^{-4}$

$x = 2.4 \times 10^{-4} = [H^+]$ $pH = -\log([H^+])$
3.62

Feb 28-8:47 AM

(17.18) (0.085 M HLA) $K_a = 1.4 \times 10^{-4}$

HLac \rightarrow H ⁺ + Lac ⁻		
I	0.085	x
<hr/>		
A	-x	+x
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E	0.085-x	x

% ionized = $\frac{x}{0.085}$

$$K_a = \frac{(H^+)(Lac^-)}{(HLac)} = \frac{(x)(x)}{0.085-x} = 1.4 \times 10^{-4}$$

x = _____

Feb 28-8:54 AM

(17.6) 125 ml 0.05 M HF + 50 ml 0.1 M NaF

pH = ? * Change in volume to 175 ml total
This change the M of each!

Moles = M * V @ convert to moles

$\frac{6.25 \times 10^{-3} \text{ moles HF}}{0.175 \text{ L}}$ + $\frac{5 \times 10^{-3} \text{ moles NaF}}{0.175 \text{ L}}$


Recalc new M $\Rightarrow \frac{M \cdot \text{Moles}}{V}$

$3.57 \times 10^{-2} \text{ M HF}$ (WA) + $2.86 \times 10^{-2} \text{ M NaF}$ (SAH or WA)

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

$pH = -\log(6.8 \times 10^{-4}) + \log \frac{2.86 \times 10^{-2}}{3.57 \times 10^{-2}}$

pH = 3.07

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

 pH ↑
 b/c less acid
 (lower [H⁺])

Feb 28-8:58 AM

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

I	M	α	$\alpha + 2$
Δ			
E			

$NaF \xrightarrow{100\%} Na^+ + F^-$

2M	α	α	I
-2	+2	+2	Δ
α	2	2	M

Common ion

Feb 28-9:13 AM

HW: 17 / 21

Feb 28-9:15 AM