

(16.53) Lactic Acid  $(\text{CH}_3\text{CH}(\text{OH})\text{COOH})$   
 Lactate ion organic acid

$\text{H Lac}$

$\text{HA} \rightarrow \text{H}^+ + \text{A}^-$

$\text{H lac} \rightarrow \text{H}^+ + \text{lac}^-$

I	0.1	?	?
D	-x	+x	+x
E	0.1-x	x	x

$\text{pH} = 2.44$   
 $\text{pH} = -\log[\text{H}^+]$   
 $2.44 = -\log[\text{H}^+]$   
 move @ Before anti-log.  
 $-2.44 = \log[\text{H}^+]$   
 $[\text{H}^+] = 3.63 \times 10^{-3} \text{ M}$

$K_a = \frac{[\text{H}^+][\text{lac}^-]}{[\text{H lac}]} = \frac{(3.63 \times 10^{-3})(3.63 \times 10^{-3})}{0.1 - 3.63 \times 10^{-3}} = 1.36 \times 10^{-4}$

Mar 16-7:24 AM

(16.57) Umejar Acetic acid  
 $\text{H}_2\text{Ac}$

$\text{pH} = 2.9$   
 $\text{pH} = -\log[\text{H}^+]$   
 $[\text{H}^+] = 1.3 \times 10^{-3}$

$K_a = 1.8 \times 10^{-5}$   
 WEAK Acid.

$\text{HA} \rightarrow \text{H}^+ + \text{A}^-$

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

Strong Acid = lots of  $\text{H}^+$   
 $K_a = \frac{\text{Large}}{\text{Small}} = \text{Large } K_a$

I	?	?	?
D	-x	+x	+x
E	?-x	x	x

$K_a = \frac{(\text{H}^+)(\text{Ac}^-)}{(\text{H}_2\text{Ac})} = 1.8 \times 10^{-5}$

$= \frac{(x)(x)}{?-x} = \frac{1.8 \times 10^{-5}}{1} = \frac{(1.3 \times 10^{-3})(1.3 \times 10^{-3})}{(? - 1.3 \times 10^{-3})}$

$? = 0.09 \text{ M}$

Mar 16-8:22 AM

(1663)  $\text{HSac} \rightarrow \text{H}^+ + \text{Sac}^-$

I	0.1	0	0
Δ	-x	+x	+x
E	0.1-x	x	x

$K_a = \frac{[\text{H}^+][\text{Sac}^-]}{[\text{HSac}]}$

$\frac{(x)(x)}{0.1-x} = \frac{4.79 \times 10^{-3}}{1}$

$x = 1.96 \times 10^{-2} = [\text{H}^+]$

$\text{pH} = 1.71$

Weak monoprotic acid

$\text{pK}_a = 2.32$

$\text{pH} = ?$

0.1M HSac

Mar 16-8:31 AM

$\text{pK}_a$  ???

$\text{pK}_b = -\log K_b$

$\text{pH} = -\log [\text{H}^+]$

$\text{pOH} = -\log [\text{OH}^-]$

$\text{pK}_a = -\log (K_a)$

$-2.32 = \log K_a$

$K_a = 4.79 \times 10^{-3}$

Mar 16-8:34 AM

$$K = \frac{[Prod]}{[React]}$$

$K_c$   
 $K_{sp}$

$K_w$  Water  
 $K_a$  Acid  
 $K_b$  Base

Mar 16-8:39 AM

**% ionized**

$$\% = \frac{Part}{Whole} \times 100$$

pph = parts per hundred.

HA	$\rightarrow$	H <sup>+</sup>	+	A <sup>-</sup>
I	1	x		x
D	-x	+x		+x
E	1-x	x		x

$\% \text{ ionized} = \frac{x}{1-x} \times 100$   
 read at Eq  
 Start with...

Mar 16-8:40 AM

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

I	0.1	0	0
A	-0.1	+0.1	+0.2
E	0	0.1	0.2

MOLE RATIO  
 $\text{pOH} = -\log(\text{OH}^-)$   
 $\text{pH} + \text{pOH} = 14$

Mar 16-8:44 AM

Watch MOLE RATIO  
 \*  
 16 / 50, 54, 64

Mar 16-8:46 AM